MAIMONIDES AND THE SCIENCES

BOSTON STUDIES IN THE PHILOSOPHY OF SCIENCE

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VOLUME 211

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Fourteenth-century illustration from Maimonides' *Guide of the Perplexed* in the Royal Library, Copenhagen, from *Hebrew Illuminated Manuscripts* by Bezalel Narkiss (Jerusalem: Keter Publishing House Ltd., 1969).

MAIMONIDES AND THE SCIENCES

Edited by

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and
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SPRINGER-SCIENCE+BUSINESS MEDIA, B.V.

Library of Congress Cataloging-in-Publication Data is available.

ISBN 978-90-481-5348-0 ISBN 978-94-017-2128-8 (eBook)
DOI 10.1007/978-94-017-2128-8

Printed on acid-free paper

First published 2000
Reprinted 2001

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Originally published by Kluwer Academic Publishers in 2000

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PREFACE

Volumes devoted to the relations of distinguished philosophers to the sciences of their times have been a part of the *Boston Studies in the Philosophy of Science*. This book, long overdue, provides a link in that series.

Maimonides was deeply involved with all European sciences. In his lifetime and after, though his positions were often at the center of controversies, Moses Maimonides was thought to be the greatest Jewish religious genius following the biblical Moses. He was seen as master of the Talmudic literature and its commentaries, of critical Jewish law, rationalism, spirituality and piety. He was also recognized for his mastery of the equally classical Greek philosophies of man and nature and their creative elaboration by medieval Arabic commentators, of high Arabic culture and the development of Aristotle's appreciation across western civilization. Devoted to his faith and to the vast traditions of Jewish learning, he was a philosopher of rational sensitivity, repeatedly laboring at the central questions of the philosopher: Who is man? What is nature and what is beyond the natural? How might we ever know and to what action would this knowledge obligate us? How shall we be responsible both to the law and to wisdom, however rational it may be, while also mediated through revelation, contained in the sacred scriptures, and represented in authentic traditions? To what extent should we allow ourselves to be influenced by inexorable logic and reliable observations? In arguing for the location of the sciences at the very center of religious life, the influence of Maimonides on Judaism, Christianity, and Islam as well as the movement of thought leading to modern science was significant. It remains with us now.

Maimonides was the master of clarifying what was enigmatic and codifying what was jumbled; he saw the insights of indirect as well as direct argument and demonstration, of parable as well as syllogism. He was the careful student of so many in the splendid Arabic culture of his age, and the creative critic, too. And he was ever attentive to the philosophies and practices of the knowledge of nature, to be found in the study of astronomy or mathematics, arithmetic, geometry, probability, and logic, in medicine or physics, linguistics or psychology, the pseudo-sciences of astrology and irrational divination, or the creative order needed for comprehensive encyclopedic work.

We especially want to understand Maimonides in his relations to the science of his time. What did he himself contribute but also what were the received

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, ix–xi.
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understandings of the human body, the natural environment, and the ways of thinking. But to see 'Maimonides and the Sciences' requires us to see a central issue of European culture through him, that great dialectic of rationalism vs. mysticism. For Maimonides, the issue could not come down to simply rational Athens vs. mystical Jerusalem. For him there were mysticisms in both, rationalisms in both. Perhaps through rational, empirically disciplined thought, acknowledging perplexity and with the assistance and elucidation of more science, a sound path to religious knowledge could be found. Philosophy and science were no simple 'handmaidens to theology'.

Without science, one cannot understand, much less meditate on Maimonides. How deeply Maimonides was based in the sciences was recognized by his admirers, commentators, and expositors. One of them, Rabbi Levi ben Abraham ben Hayyim, in 1296 wrote an encyclopedia of philosophy, religion and especially science in order, as Warren Zev Harvey recently tells us, to advance true religion which had been superbly set down in Maimonides' *Guide of the Perplexed*.[1] In Rabbi Levi's words, "Maimonides did not compose his enlightening book except for one who has studied all the books of the sciences".[2] Levi's concise, witty work of rhymed prose in ten books was soon followed by a major propaedeutic to Maimonides' great but enigmatic *Guide*, the encyclopedia of Rabbi Levi entitled *Chaplet of Grace* (*Livyat Hen*).

The controversy over creation, and over the mysterious but nevertheless responsible Creator was in ancient times, in medieval Arabic, Jewish and Christian times, in the lands of Southern and East Asia, and now in our own time too, intertwined with other puzzling questions: is there stability and continuity to the heavenly reality, do the changes that appear take place by contingency or lawfulness, indeed is there a history of the world encompassing the heavens, above our lunar/solar system? Does the act of creation occur at a moment in time or is it implicit to have been at the beginning of time? For Maimonides, these traditional and ever-debated issues were theological and metaphysical as well as scientific, involving observation and rationally developed inferences. If the world, the cosmos, were eternal, as described by Plato or Aristotle and as mediated by Arabic philosophers, nevertheless the order of the world and its cosmic structure required a creative moment. This is analogous to the sculptor putting form into pre-existent clay. But this would not do for Maimonides, who wrote that "heaven was generated out of nothing after a state of absolute non-existence" (*Guide* 2: 284). These issues of the nature of that obscure pre-existing matter and creativity, of time and infinity, issues which divided Maimonides and his contemporaries, these issues re-appear in our own metaphor of the Big Bang. They remain among the unresolved questions of contemporary cosmology.

This book complements the volumes of *Boston Studies* devoted to Spinoza, Goethe, Hegel, Nietzsche, Bergson and others while pushing back the agenda for discovering in world literature the influential philosophical contexts for the development and dissemination of science. We celebrate with the contributors to this volume, the eminent scholars from the various disciplines needed to elucidate these issues, the bridging of a significant gap in knowledge.

The late Professor Isadore Twersky, a contributor to this volume, in an essay on Maimonides' exclusive position in Jewish history, quotes the 15th century scholar, Solomon ben Simon Doran:[3]

> "And all the authors who succeed him and the commentators that went in his footsteps, whether among the Muslims or the Christians, even though they superceded him on some issues (*bemikisat devarim*), all concede to his precious and glorious greatness ... ".[4]

Twersky summarizes the praises and appreciation that Maimonides evoked notwithstanding the polemics which surrounded him.

This volume and the symposium upon which it is based attest to that greatness achieved by Maimonides in his own time and his enduring influence in subsequent generations. And yet we must ask: what was Solomon Doran's qualification to his general assessment of Maimonides? Was he conveying the appreciation of his contemporaries to Maimonides' accomplishments and reputation in the sciences, and to what extent are modern deliberations in accord with this evaluation?

An evaluation of Maimonides and the sciences, as this volume attempts, must go beyond an evaluation of the scientific information available to Maimonides at different points in his life, of his methodology in analyzing that information, and the epistemological weight that he assigns to science. Creativity and innovation are generally the standards of scientific achievement even in pre-modern science. Yet in evaluating a thinker as rich and complex as Maimonides, the very terms of creativity must be expanded as the essays in this volume so amply demonstrate.

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NOTES

[1] Warren Zev Harvey "Levi ben Abraham of Villefranche's Controversial Encyclopedia," *The Medieval Hebrew Encyclopedias of Science and Philosophy*, Steven Harvey, ed. (Dordrecht/Boston: Kluwer, 2000), 171–188.

[2] Quoted in op. cit., 172

[3] Isadore Twersky: "Ledmuto shel Harambam: Masa al maamado hayehudi betoldot Yisrael," *Asufot Yearbook for Judaic Studies of Yad Harav Nisim*, Book 10.

[4] Rashbah, *Sefer Milhemet Mitzva*, p. 21, as cited above.

Y. TZVI LANGERMANN

MOSES MAIMONIDES

Moses Maimonides (1135–1204) is without a doubt the single most luminous figure in Jewish intellectual history since Talmudic times. He possessed professional expertise in most of the sciences of his day, most notably astronomy, mathematics, and medicine. Maimonides' early education in Spain, the country of his birth, seems to have stressed the exact sciences in particular. He refers in his writings to his studies with some students of Ibn Bājja. Furthermore, he edited and taught scientific texts written by two Andalusians, Jābir ibn Aflaḥ and al-Mu'tamir ibn Hūd.

In matters astronomical Maimonides' chief contributions concern problems of cosmology and the first visibility of the lunar crescent. As to the former, Maimonides devotes an entire chapter (II, 24) of his philosophical *chef d'oeuvre*, *The Guide of the Perplexed* (Arabic *Dalālat al-Ḥā'irin*: Hebrew *Moreh ha-Nevukhim*), to a discussion of the various ways in which the then-accepted models for planets violate certain basic principles of Aristotelian natural philosophy, namely that all heavenly motions be uniform, circular, and about a stationary center. (This problem, by the way, seems to have vexed Andalusian thinkers in particular.) Maimonides surveys the proposed solutions of Ibn Bājja and Thābit ibn Qurra, but he finds no way out of the quandary. It remains a matter of debate among scholars whether Maimonides considered the problem insoluble, since the true workings of the heavens are a matter of metaphysics and hence beyond full understanding, or whether he felt the problem had a solution, indeed, one which would yield a system not very unlike the Ptolemaic models which he criticizes.

In the closing chapters of the section of his law code (*Mishneh Torah*) devoted to the sanctification of the new moon, Maimonides develops a full, sophisticated method for computing whether or not the crescent will be visible on the eve of the thirtieth day of the lunar month. One calculates the "arc of vision," which is the sum of the difference in right ascension between the true positions of the two luminaries, and two-thirds the latitude of the moon. If this arc is greater than 14°, or the sum or the arc and the elongation (the difference in ecliptic longitude between the two luminaries) is greater than or equal to 22°, the moon will be visible. As Maimonides himself avers, the method draws upon written sources, but some of the procedures have been simplified without doing damage to their accuracy.

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Maimonides forcefully repudiated astrology. Like nearly all of his contemporaries, he acknowledged a gross physical effect which the motions and luminescence of the heavenly bodies exercise upon terrestrial processes. However, he rejected the notion, central to the astrology of his day, that the stars emanate any non-corporeal force, and he passionately urged that neither individuals nor nations allow themselves to be guided by astrological forecasts.

Maimonides was both a practicing physician and a medical author. According to his account, he travelled daily to treat the sick at court, and upon his return he found his waiting room full of patients. His medical writings include condensations of the important works of Galen, and a number of original books and monographs. The final section of his own *Aphorisms* (*Fuṣūl Mūsā, Pirqei Moshe*) consists of a scathing critique of Galen's views on medicine and philosophy. Maimonides' medical writings display erudition, clear and concise formulations, and insight; however, his place in the history of medicine, particularly against the background of his contemporaries, remains to be determined.

Maimonides held definite opinions concerning the history and philosophy of science. Scientific teachings must be founded upon solid logical demonstrations. True, observations are vital, but purely empirical claims – those whose authenticity rests solely upon repeated observations, but cannot be placed within any logical framework – are not scientific. This point is made forcefully in his treatise on asthma, and it is one of the underpinnings of his rejection of astrology. Moreover, Maimonides held the view that science progresses in a cumulative fashion, through the refinement of existing data and the absorption of new information; there are no revolutionary leaps. Thus he was able to have it both ways with regard to unsolved issues, e.g. the question of the structure of the heavens. He took tactical advantage of the problem, using the cosmological quandary to attack the doctrine of the eternity of the universe (which rested on astronomical arguments), yet at the same time he felt confident enough in his basic understanding of the workings of the heavens to make use of that knowledge as a steppingstone in the path to knowledge of the Creator.

The most lasting influence of Maimonides, at least as far as his Jewish readership is concerned, was not in the specific scientific knowledge that he disseminated. Rather, his momentous contribution was to elevate the study of the sciences within the context of the religious life. According to Maimonides, the ritual performances and ethical demands of the Jewish tradition have as their goal the preparation of the individual for knowledge of God (to the extent that this is humanly possible), and mastery of the sciences is an indispensable step in this process of religious fulfilment. The observant Jew who follows the lead of Maimonides will regard the study of the sciences as a primary religious obligation.

Y. Tzvi Langermann

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ALEXANDER ALTMANN

DEFINING MAIMONIDES' ARISTOTELIANISM

The Aristotelian legacy presented itself to Maimonides in three distinct layers between which his historical sense knew well to differentiate: the authentic writings of Aristotle; the Byzantine commentaries; and the Muslim Aristotelians. With characteristic sensitivity, he gave no credence to any of the pseudo-Aristotelian writings which had played an important role in Jewish Neoplatonism. In this respect he was far more of a purist than al-Farabi (who, for exoteric purposes, drew on the *Theology of Aristotle* in order to harmonize Plato and Aristotle) and Averroes (who, for similar reasons, invoked a "metaphysical treatise by Aristotle" as yet unidentified and also quoted Ps.-Aristotle, *De mundo*). The passages Maimonides cites verbatim – "This is what he Aristotle actually says" – from the genuine Aristotelian *corpus* are not always models of accuracy but this is due to the liberties occasionally taken by the Arabic version of the text which, on the whole, is remarkably faithful to the original.

Of the Byzantine commentators of Aristotle known to, and utilized by Maimonides, those to be named are Alexander of Aphrodisias and Themistius. He is acquainted also with John Philoponus but has little respect for him as a philosopher, ranking him as he does among the founders of Kalam. He quotes al-Farabi's refutation of Philoponus in the former's (now lost) work *The Changing Beings*. As against the commentators he designates the Muslim *falāsifa* – chiefly al-Farabi and Avicenna – as "latter-day Aristotelians." From them he adopts the peculiar combination of Aristotle's movers of the spheres with the neoplatonic system of emanations. At the same time, he seeks to divest the emanationist theory of its apparent crudity and to approximate it to Aristotelian categories. It should also be noted that his elaborate critique of Aristotle's doctrine of the eternity of the world is directed, in large measure, against the arguments advanced by the "latter-day Aristotelians." There is an obvious tendency on his part to go back to, and take issue with, the authentic Aristotle. Even though there is definite evidence of neoplatonic influence on his thinking, notably as far as his negative theology is concerned, the Aristotelian orientation re-asserts itself in his concept of God as the *actus purus* of thinking. All of which goes to show that the term "neoplatonic Aristotelianism" (which fits the *falāsifa*) is not wholly appropriate in the case of Maimonides. It would be nearer the truth to say that certain neoplatonic notions served him as grist

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to his Aristotelian mill. In a similar way, certain Kalām concepts (such as the notion of "particularization") were made use by him within an ultimately Aristotelian framework.

That Maimonides considered Aristotle to represent the acme of philosophy is attested by many of his utterances. Aristotle is the "head" (*rā'is*) of the philosophers. He "reached the highest degree of intellectual perfection open to man, barring only the still higher degree of prophetic inspiration." Maimonides prefers him to Plato whose writings are "difficult and couched in allegories." There is no need, therefore, to "occupy oneself" with Aristotle's predecessors. "I shall pay no attention," Maimonides declares, "to anyone philosopher besides Aristotle," a statement which has close parallels in Averroes' writings. Maimonides calls attention to "the depth of Aristotle's penetration" and to "his extraordinary apprehension."

At the same time, Maimonides makes a determined effort to portray Aristotle as a thinker in search of the truth rather than claiming to own it. He is well aware of what has been called the "aporetic" or "dialectical" method employed by Aristotle, examining the pros and cons of opinions both past and present in order to arrive at the truth, yet remaining open to alternative solutions. This view of Aristotle as protagonist of an essentially "provisional" and "open" system has been advocated, in modern research, by Werner Jaeger and others following in his path. Maimonides may have had an axe to grind when he stressed the "unassuming *persona*" of Aristotle – the issue that concerned him was creation versus eternity – but the point he made testifies to his acute reading of Aristotle. Besides, it enabled him to assume that the tension between philosophy and prophetic revelation was less pronounced than seemed to be the case on the surface.

There still remains the basic question: To what extent was Maimonides an Aristotelian? How are we to define his Aristotelianism? There are a number of concise statements by Maimonides to guide our initial steps in answering this question. They all tend to suggest that Maimonides was an all out Aristotelian except in one respect: He parted company with him on the issue of the world's eternity as a correlative to the world's necessity. "All of us aim at one and the same principle, i.e. the First Cause. But he Aristotle holds ... that everything other than it necessarily proceeds from it. We affirm that all these things have been made by Him in virtue of a purpose and a will." Considering the prophetic and the philosophic opinions, "you will find no difference other than the one we have explained: namely, that they the Aristotelians regard the world as eternal and we regard it as produced in time." Maimonides' effort is ostensibly directed at refuting the semblance of inevitability claimed for Aristotle's position and at showing, at the same time, that the opposite view is philosophically tenable. In interpreting Maimonides' endeavor, we intend to make it clear that, notwithstanding its religious motivation, its mode of procedure is thoroughly Aristotelian; that it stays within the Aristotelian frame of reference and, in a sense, tries to be more Aristotelian than Aristotle was. The stance presented is not that of a theologically qualified Aristotelianism. In intent, at least, it is rather that of a logically consistent Aristotelianism. Maimonides is obviously not

prepared to compromise his seriousness as a philosopher much as he tries to accomodate religious belief within its confines. Whether this very elaborate harmonizing effort represents his ultimate, esoteric view of things is another matter.

It follows from the afore-going outline of our approach that what needs close investigation is the Aristotelian concept of "necessity" (arab. *luzūm*; hebr. *ḥiyyuv*; and their equivalents). Its corollary is the notion of eternity, as we shall have occasion to observe. What is of decisive importance, however, is the interplay of necessity – a concept variously defined – with the teleological principle. It is the dialectic of necessity and purpose that characterizes Aristotle's fundamental outlook and enables Maimonides to assert the role of purpose in the universe. Whereas Aristotle confined that dialectic to the sublunar realm, the world of physics, Maimonides extended it to the translunar sphere of astro- and metaphysics. He thereby challenged Aristotle's thesis of absolute necessity as operative in the universe determined by the motions of the heavenly bodies, and he did so on allegedly Aristotelian grounds. In so doing, he defined himself as it were as an Aristotelian up to the hilt.

I. NECESSITY AND PURPOSE IN THE SUBLUNAR WORLD. ART AS MODEL OF NATURE. THE FOUR CAUSES

Necessity, in its primary sense, is defined by Aristotle as "that which cannot be otherwise." It therefore denotes the given as an ultimate, as the way in which things invariably are and must be accepted beyond further reasoning. The *anankē* myth of Plato's *Republic* and a host of religious and mythological concepts resonate in this definition. It may also be said to sum up the essence of Spinoza's philosophy. "It is from this sense of 'necessary'," Aristotle says, "that all others are somehow derived." Those other modes of necessity are (1) coercive (externally imposed) necessity (which, however, is said in another place to fall outside that "which cannot be otherwise"); (2) simple or absolute necessity (ἁπλῶς); and (3) conditional or hypothetical necessity (ἐξ ὑποθέτεως).

Simple or absolute necessity is of two kinds. It means, in the first place, the "mechanistic reactions of materials," the fact that "things are as they are [and operate] owing to their very nature." Necessity of this mechanical, automatic sort is characteristic of "irrational potencies" (ἄλογοι δυνάμεις) as distinct from rational, deliberative potencies which act by choice. The "necessity" by which irrational potencies such as fire operate implies the absence of choice or purpose. Simple or absolute necessity signifies, in the second place and, in a sense, primarily, the very being of eternal and unmoved substances, i.e. the noetic movers of the celestial spheres. On account of their utter simplicity they "cannot be in more than one condition." Their immutability constitutes their necessity. Thus, Aristotle comprises both the irrational potencies in the world of coming-to-be and passing-away and the unchanging movers of the spheres under the same rubric of absolute necessity. This is less surprising than might appear. For Aristotle considers the process of coming-

to-be and passing-away to be just as necessary and eternal – hence cyclical and returning upon itself – as the motions of the heavens. In fact, he affirms the identity of the necessary and the eternal: "for what must *necessarily* be, must at the same time *always* be, since what 'must necessarily be' cannot 'not-be'; hence, if a thing is 'of necessity', it is eternal, and, if it is eternal, it is 'of necessity'."

The third mode, conditional or hypothetical necessity, presupposes the notion of purpose. Necessity in this sense means "that if this or that is to be the final cause and purpose, then such and such things must be so." A saw must necessarily be made of iron if it is to serve its purpose. The justification for calling absolute and hypothetical necessity by the same term (ἀνάγκη) lies in the fact that the latter implies the former: It is the absolute necessity inherent in the nature of the material (iron) that makes its use for certain purposes (e.g. serving as a saw) a conditional necessity. Teleological causality is intertwined with mechanistic causality. As Aristotle put it, "We have, then, these two causes before us, to wit, the 'final' cause, and also necessity."

Hypothetical necessity thus leads us right into the heart of Aristotle's view of nature. The twofold causality (teleological and mechanistic) entails a twofold sense of the physical: as form and as matter of a natural thing. The mechanistic explanation of nature is not false, but insufficient. The teleological view embraces the mechanistic one, and the latter is subordinated to the former. Natural processes happen of necessity, yet for the sake of an end. Unlike Empedocles, Democritus and Anaxagoras who reduced nature to a concurrence of necessity and chance happenings, hence to mechanistic processes, Aristotle regarded coming-to-be and passing-away as determined by both necessity and purpose (τέλος). Thus, the sun's movement in the ecliptic is mechanically responsible for coming-to-be and passing-away, and it is, at the same time, teleologically necessary as a condition for the circular movement of becoming and decay by which the order of the sublunar world is maintained. In the process of becoming, which is a struggle between material and form, the latter normally succeeds but, at times, the non-teleological activity of matter asserts itself and failure (such as monstrous births) ensues. As Aristotle maintains, there is more purposiveness in nature than in art.

The doctrine of the two kinds of causality is fully elaborated in Aristotle's famous presentation of the four causes that operate both in art and in nature. It is a remarkable fact that he had not the slightest hesitation to apply the model of art *mutatis mutandis* to the processes of nature. This procedure has met with occasional criticism. It has been characterized as "anthropomorphic" and "technomorphic." Against this objection it has been pointed out that both for Plato and Aristotle art (τέχνη) is not something alien to nature since they are immediately related to the idea. Nature, no less than art, is activity guided by the idea. Plato's demiurge creates by looking at the idea, and Aristotle speaks of creative nature (φυσις δημιουργοῦσα). Hence the application of the model of art to nature cannot be considered an illicit transference. It plays, at all events, a decisive role in Aristotle's thinking.

The four causes (αἰτίαι) – the final, material, efficient and formal – are

more clearly discernible in art than in nature, which is obviously the reason why Aristotle chose art as the model. In art the efficient or moving cause is invariably separate from the thing effected while in natural processes it may be separate (as progenitor or seed), but in most cases it works as an immanent cause. Moreover, the progenitor reproduces himself, whereas the agent in the realm of art produces the form which he carries as an object of thought in his soul. As agent, he is a rational potency acting from choice. The form corresponds to the purpose he seeks to achieve and he reaches his goal by employing the necessary means (materials) in due proportion to the purpose. In the case of the architect who builds a house – one of Aristotle's favorite examples – the purpose-serving materials must be there if there is to be a house but the materials will not account for the existence of the house. It is the "purposeful intention of the maker" – the purpose of protecting and preserving certain goods – that is responsible for it. Art – the form of the purpose-fulfilling object – is a rational potency in the soul of the agent or efficient cause. The technician must know both the form as determined by the purpose and the necessary means.

What is it in natural processes that functions as an analogue to the mind of the architect? In the case of procreation, we noted above, an external agent, the semen, shapes the material (the menstrual blood, which, in Aristotle's view, is the sole substance of the foetus). The semen contains the form, the purpose and the moving power (δύναμις), and would, therefore, seem to be a perfect analogy to the architect's mind, except for the fact that no conscious activity is involved. In fact, Aristotle compares the semen not to the architect's mind but to his tools which shape the material, and he draws a distinct parallel to the model of art when he says: "In a similar way to this [i.e. the carpenter's moving his tools in accordance with the 'form' in his soul], Nature acting in the male of semen-emitting animals uses the semen as a tool." In a subsequent passage discussing other forms of generation, he describes Nature as "watching over the business" and as resembling a modeller in clay rather than a carpenter. Nature is presented here as the exact counterpart to art. It is pictured as going about its "business" in a circumspect and deliberate way, an image that comes close to the characterization of nature as "wise" and as "doing nothing to no purpose."

These personifications of Nature need not be taken too literally. In yet another passage Aristotle identifies the generative principle which uses heat and cold as its "instruments" in analogy to the instruments of human art with the *dynamis* of the nutritive soul, and he says of this "part of Soul" that it is the "nature" (.....) of plants and animals. Nature with a capital N is but an abstract of the concrete natures of organic (and unorganic) entities. In Aristotle's all-embracing definition, nature is "the principle and cause of motion and rest to those things, and those things only, in which she inheres primarily, as distinct from incidentally." It is also the form of natural things and, as such, the goal, the "for-the-sale-of-which" of the natural process. In this respect, nature is worlds apart from art: none of manufactured things "has within itself the principle of its own making." Yet despite this difference, there

is a structural analogy between art and nature.

The coming-to-be of natural things as described above is still short of an originating principle comparable to the conscious mind that produces artificial things. Does Aristotle posit such a principle beyond and above the unconscious activity of nature? That he is groping for an intelligent principle is shown by the way in which he illustrates the purposefulness in natural processes – an exact parallel, he insists, to artificial processes – by "the works of spiders and ants" which, clearly, are not "the outcome of art" or "deliberation," yet have been attributed to "intelligence" (νῷ) or "some similar faculty." In *Parts of the Animals* where, again, the purposiveness of things "arranged by Nature" is stressed, he says of the "principle" (ἀρχή) or "cause" (αἰτία) of those things that it "came to us from the universe around us." One may connect this passage with the one in *Coming-To-Be and Passing-Away* which makes the annual course of the sun in the ecliptic circle responsible for the continuous process of becoming and decay. This causality is credited, on the one hand, to Nature, on the other to God who "perfected the universe by making coming-to-be a perpetual process." In *Metaphysics*, XII Aristotle lists "the sun and the ecliptic" as one of three causes of the generation of man; the two others are the elements (the material cause) and the progenitor (the formal cause). The discussion moves, however, steadily on toward the notion of God as the "first principle and primary reality." An early passage points already in this direction: "The art of building is the form of a house, and man begets man: but besides these there is that which as first of all things moves all things." The climax is reached in the statement: "Such then i.e. the unmoved necessary Being is the first principle upon which hang the sensible universe and the world of nature." It should cause no surprise, therefore, to read in *On the Heavens*: "But God and nature produce nothing that does not fulfil a purpose."

Not all commentators of Aristotle interpret the trend of the discussion in *Metaphysics*, XII as leading up to the notion of the First Mover as the ultimate cause of purposive processes in nature. The passage 1070b (3–35 ("... besides these there is that which as first of all things moves all things") is understood by Themistius to mean that the First Mover to be spoken of subsequently is in a category different from the proximate movers such as operate in art and procreation. Alexander of Aphrodisias, on the other hand, sees here precisely a reference to "another principle" shared by all the proximate movers, a view ostensibly adopted by Averroes. For Themistius, it seems, the sun's course in the ecliptic represents the highest principle determining the process of coming-to-be in that it engenders the world-soul (lit., "the soul that is in the earth"), a concept he links both to Plato and Aristotle. "It is not to be wondered at," he says, "that nature should bring that which it does to an intended end without comprehending it. For it neither knows nor conceives what it does. This proves that the proportions [inherent in the efficient cause] derive from the most noble and elevated cause: the world-soul, of which Plato says that it is generated by the secondary deities and which Aristotle traces to the sun and the ecliptic. It is for this reason that nature does what it does, directed towards an end it does not comprehend. Just as we meet people that are inspired to utter prophetic

words without understanding what they say." Shahrastānī's short paraphrase of the Themistius passage is certainly in error when it identifies the most noble cause by which nature is "inspired" with God.

JOSEPH AGASSI

MAIMONIDES IN CONTEXT*

PREFACE

Contemporary students of philosophical texts of late Antiquity and the Middle Ages share one overall concern. They usually center on one question, how were faith and reason harmonized there? They rightly assume that, ever since Philo Judeus, the major self-imposed task of diverse philosophers of late antiquity and the Middle Ages concerned the rational attitude to faith (in one or the other of the three leading western religions and regarding any aspect of it, dogma, practice or anything else): it was the effort to bring faith into harmony with reason – to harmonize the particular with the universal. (A famous treatise of Averroes is *Harmony of Religion and Philosophy*. See Davidson, 1992, 348). Historians of philosophy ignore as much as possible those who deem religion prior and superior to reason, calling them mere theologians, not philosophers, since, by definition, philosophy seeks the universal. So the attribution to religious philosophers of the desire to rationalize faith is more of a historical demarcation than a historical statement: we call philosophers those who wished to follow the dictates of reason.

Many of the students of philosophical texts from late Antiquity and the Middle Ages also assume that the harmonization is impossible, and that this impossibility is obvious. So much so, that some of them regrettably also ascribe this view to those whose works they interpret. In this way their initial question turns into the different one: were the harmonizers rational and sincere? (See, for example, Leaman, 1988, 144: 'Let us examine more closely the assumption that Averroes ... pretended to believe ...').

The prevalent view of rationality today is strongly influenced by Descartes' assumption that rationality begins by suspending judgment on all inherited beliefs, and proceeds with the reaffirmation that they are independent of local lore and local standards. This assumption is much more radical than the one it came to replace. The older assumption demanded harmonization, not full justification and no suspension of judgment. Significantly, in line with Aristotle's view that leisure is essential for contemplation, it assumed that rationality is available only in a fairly prosperous society, and that prosperity demands some orderly social life, so that rationality is the characteristic of

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 9–24.
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thinking within civil society. As religion is a precondition for the possibility of civil society, it must also be allowed *a priori*. (See Al-Farabi, 1985, 245, §10, and 432, n. 605).

(This is the central difference between the Hellenic and the Hellenistic philosophers: the later philosophers saw in the rationalism of the earlier ones a danger to social stability. A stoic metaphor expressing the change was popular also in the Middle Ages: the earlier philosophy is flowers and the later is bread. See Kraemer's observations cited below).

Can the historians of philosophy who ignore theologians as much as possible also ignore the religion of religious philosophers while studying their philosophies? The Cartesian approach encourages this (even though for the sake of historical precision it should be noted that Descartes himself shared much with some of his predecessors, such as Al-Ghazali; see Sabra, 1994, 31): Cartesian rationality (as modified by Spinoza) opposes the assumption that rationality depends on the existence of civil society, with or without religion.

It is hard to say what is a more rational basis for philosophy, the existence of civil society or Cartesian universal doubt plus Cartesian methods and criteria. The Cartesian system has failed for a basic reason: it is ahistorical. The older view of rationality suffers from traditionalism. This defect can be evaded. Maimonides says (*Code*, Book 1, Of Knowledge, Treatise 2, Laws of Opinions, Chapter 2), deviants should request people reputed as wise to heal their minds. This may be modified and becomes the proposal to familiarize oneself with received opinions, and subject them to critical debate before replacing them (Popper, 1961; also his 1945, Chapter 24).

Is this philosophy (methodology, epistemology)? Leo Strauss said, no; it is the sociology of philosophy. Yet he notices (1952, 8) that it is necessary in order to understand mediaeval philosophy. The sociology of philosophy was missing because Descartes replaced it with his thought experiment of an individual working out a philosophy in total isolation. Whether the sociology of philosophy is allowed as philosophy or not, it is needed as a context for the history of philosophy; yet this is not sufficient: if the history of philosophers prior to Descartes is to be admitted, then they should not be put in a Procrustean bed of Cartesian principles.

I. THE BACKGROUND TO MAIMONIDES

Strauss opened his essay on Maimonides (1941) with the observation that all interpreters endorse the maxim that a presentation of the ideas of a historical figure requires some historical context, yet few attempt to follow this maxim to the full. He reported that he had managed to perform a "most thoroughgoing application" of that maxim, thus attaining "the true and exact understanding of Maimonides' teaching"; he even indicated that in this way he settled the disputes on the matter. This is naive in the extreme, of course. Disagreement about historical contexts cannot be fully eliminated. Nor can knowledge of the context of a text shed full light on it, especially when it is esoteric; and Maimonides' philosophical text, his *Guide of the Perplexed*, is openly presented

as esoteric: its preface opens with a confession that its meaning is obscured so as to be incomprehensible to the ignorant. It is sufficiently obvious why Maimonides wished his text to be incomprehensible to the ignorant: he was following Al-Farabi in his speaking disparagingly of the common people. This is in part a result of Plato's influence. They both showed a concern for the welfare of common people, intending not to confuse them, and also to enlighten them, since popular enlightenment is a precondition for the ideal society that they both aspired for. Yet they took the contempt of common people for philosophy as a sufficient reason to encourage them not to read philosophy before they were prepared for it.

Strauss's effort to reach "the true and exact understanding of Maimonides' teaching" was aided by some theory, of course. His theory is not generally endorsed (Kojéve, 1964). Perhaps there is no need to worry about Maimonides' wish to have his book closed to the ignorant, since the modern interpreters of this text are not ignorant. Yet the worry persists since, as he said explicitly, he intentionally contradicted himself, and interpreters have to decide what were his intended contradictions, so as to distinguish between intended contradictions and ones committed inadvertently (Pines, 1979, n. 82). A reasonable hypothesis may serve as a clue: the intended contradictions are all of one kind. The question is, of what kind?

Strauss had an answer, and it is a poor one. He said, the esoteric part of the book is the traditional part of Jewish mysticism, which Maimonides interpreted as metaphors. It was traditional to explain away impossible texts by viewing them as metaphors, and Maimonides did so regularly and quite openly. Yet Strauss suggested that the intended contradictions are between the literal and the metaphorical. These, however, are not contradictions that conceal ideas: they are contradictions only in the metaphorical sense, and they conceal nothing. To be clear we may ask first, what did Maimonides wish to conceal?

This question raises a prior question: how did Maimonides decide what texts have to be interpreted metaphorically since taken literally they are false? This depends on the question, what was his philosophy and how did he try to harmonize faith and reason? We may take what he deemed the dictates of reason as the standard for what invites reinterpretation. What did Maimonides take to be these dictates? This depends on a basic question that is central to the whole current literature on the interpretation of Maimonides: did he assume that faith and reason are in conflict? And if so, which of the two did he opt for? Most of the commentators assume that faith and reason are in conflict, and then they tend to ascribe this to Maimonides. They then have little choice but to ascribe to him the cynical view that religious tenets are fit for the vulgar; this leads to the ascription to him of the wish to conceal his religious disbelief. This cynicism is hardly consistent with his immense sincerity, courage and piety. The ascription of cynicism to him was refuted by Shlomo Pines, the greatest modern Maimonides scholar (1986): though the *Guide* is esoteric, the *Code* is not, and its First Book reveals his philosophical theology openly and with no compunction; it makes little sense to suggest that he masked in one book what he openly declared true in another.

This is a simple and powerful argument. As the *Guide* is a philosophical text, its teachings are not obligatory and so they may be concealed; not so the *Code*, which is a book of laws, a list of all the obligations that every Jew has, so that it does not avail itself to such maneuvers. Yet, Joel Kraemer notices, the *Code* has all the appearances of an open, exoteric statement of Maimonides' theology, no less philosophically so than in the *Guide*. In some respects the *Guide* is even more open than the *Code* and even on things that could be passed over in silence. The paradigm case here is Maimonides' view on creation. He disagreed with Aristotle on the question, was the Universe created? And he went out of his way to explain that his dissent was not dictated by Scriptures but by reason. He was silent about creation in the first book of his *Code*, where he found no need to express his assent to Scriptures. The opening Book of the *Code* is most philosophical in its presentation of God as a first being, as the necessary being which cannot be conceived but as existing. The idea sounds very Avicennian, and raises for the religious a very difficult question: is this necessary being the God of Abraham, Isaac and Jacob? Judah Halevi had much trouble with that notion; the *Code* does not deal with it. It is systemic and quasi axiomatic (the way later emulated by Spinoza in his systematic *Ethics*), as this was what he thought made it rational.

This was in accord with the general attitude exhibited by Muslim philosophy. (Much of Muslim culture was due to contributions of scholars who were Christian or Jewish, but it was the Muslim world in which they operated; see Seale, 1964). Al-Farabi and Al-Ghazali shared it and Maimonides was greatly under their influence.[1] They divided logic, as Aristotle did, into dialectics and demonstration, that is, to induction (*epagoge*) and deduction, to refutations and proofs. They identified the method of refutation with *kalam* (talk) and of proof with *fiqh* (systematic jurisprudence). They endorsed Plato's precept (*Laws*, 908b-909e) that dialectics should be esoteric.[2] Maimonides' *Guide* is his contribution to the *kalam* and his *Code* is his version of the (Jewish) *fiqh*. Confusion was endless as *kalam* is also the name of a movement, one that practiced *kalam*. Maimonides' opposition to that movement was taken as opposition to *kalam*. The literature still uses the word at times to mean the name of a movement and at time a method, but as a method it is not admitted that Maimonides embraced it.[3] Strauss declared that Maimonides shared much with the *kalam*. Kraemer, now the leading Maimonides scholar, has observed (1979, opening passages):

> In a famous passage of the *Guide of the Perplexed* ... Maimonides traces Islamic *kalam* to books of Greek and Syrian Christians who refuted philosophical opinion that destroyed the foundations of their Law ... Maimonides disassociated himself from this method ... *kalam* had no theoretical-demonstrative validity but is a dialectical instrument used for ulterior motives, an assessment Maimonides apparently derived from Alfarabi ...

Kraemer sees the discord of Maimonides with the thinkers of the *kalam* as his rejection not of their intent to 'refute philosophical opinions that destroyed the

foundations of their Law' (indeed, he says, 'in a sense the *Guide* is a *kalam* work', *ibid.*, 108) but of the lack of correctness and seriousness in its method: he was much more frank than they were.

Maimonides willfully contradicted himself, then, not in the sense that he willfully affirmed and denied some statements, as this is hardly conceivable of a serious thinker of his stature, but in that he repeated statements with the intent to refute them. Common people, who can only understand *fiqh*, will misunderstand any *kalam* text as *fiqh*, and thus as inconsistent. This reading is easily supported in the work of Al-Ghazali (Lazarus-Yafe, 1975, 361) and it renders Maimonides' esotericism no longer problematic. It justifies Friedman's assertion (1992, 793), 'It is misleading ... to call the *Guide* an esoteric book.'

Thus there is no problem with the contradictions in the *Guide*. Still, Maimonides asserted that he did not make it easy to read his book. How? That depends on how he could be reader-friendly? He had two reader-friendly techniques: clarity and systematic exposition of his text. The classification was meant to serve both as proofs and as means to convey a synoptic view. He claimed that the chief asset of his *Code* is its classification. (Axioms were the means of proof according to Plato; according to Aristotle definitions serve as the basis for classification and thus for proof. Maimonides fully endorsed the received view of Plato and Aristotle as expounding the same philosophy.) Maimonides' *Guide* and his *Code* carry the same message, but in different presentations: the *Guide* was meant to be dialectical and the *Code* was meant to be systematic. In the beginning of his *Guide* he advises readers to work for themselves a synoptic view, and liberate themselves from servility to tradition: the truth of tradition should be endorsed rationally. The link between the possession of a synoptic view and the avoidance of contradictions is also offered by Maimonides (still in the beginning of the book), as he enumerated seven causes for falling into inconsistency, the seventh of which is the lack of a synoptic view (Harvey, 1988, n. 2). Thus, the special puzzle that the *Guide* was shrouded in for generations is completely dispelled; Strauss's proclivity for the secretive gains no support here; instead, the recent comparisons of Maimonides with other thinkers of the period is vindicated.

The attitude to *fiqh* as deductive explains the fact that when presented systematically, theology was considered science. The Latin word "scientia" was used as a translation of the Greek word "episteme" – to mean certitude. Euclidean geometry was the paradigm of science, to be outdone only by theology. On a deep level *fiqh* is axiomatic exposition; superficially, for common readers, it is the method of plain, unexplained, dogmatic exposition, usually based on tradition (*Guide*, 3:51). His *Code* came to serve all Jews. Its quasi-axiomatic side is its beginning with theological first principles. Its dogmatic expository part includes many details, from religious taboos to empirical medicine. All this is lost on modern readers, since they are used to higher critical standards, they naturally respect science more than theology (even while seeking to resolve the conflict between faith and reason), and they are more prone to respect common people.[4]

A great, forgotten transformation was effected in our culture (in the spirit of

the modern age) by (Kepler and) Galileo concerning the duties which faith and reason have towards each other. It was popularized by Robert Boyle, whose piety was deemed above reproach and whose authority was tremendous throughout the Age of Reason. The demand is by now endorsed by many religious thinkers that reason should be free of the fetters of any particular faith. This demand is often ascribed to Galileo. It was of course made by Maimonides and by his predecessors. But with significant differences.

Maimonides' *Guide* is addressed to a very specific kind of reader: he presumed them, he said in the opening of that book, to be pious Jews, well educated and well-versed in logic and mathematics, but lacking the knowledge of physics – out of fear that it will shake their faith. He did not try to teach them physics, only to encourage them to study it, by trying to convince them that in principle there is no clash between faith and reason. The Mediaeval venture was thus to merge theology and natural science; the modern parallel task was lesser: it was to free science of theology. It was achieved at a great price, one that Maimonides was not ready to pay. The modern idea (shared by Kepler and by Galileo) is, since in principle the two truths, of faith and of reason, must harmonize, people concerned with science need not bother about the way science harmonizes with faith; they can leave this to those concerned with theology. This may be reasonable, as it reflects the concern of those who care for science and not for theology. Hence, it need not be endorsed by those who are concerned with both science and theology. The idea that those concerned with science need not be concerned with theology is very powerful; but then so is the idea that concern with both is richer.

Bertrand Russell noted this. He said (1935, 12), "The Mediaeval outlook of educated men had a logical unity which has now been lost." This unity has a great advantage, he suggested, which is outweighed, however, by the disadvantage of dogmatism (*ibid.*, 13). True, but not binding: dogmatism is reduced by indifference; it is better reduced by reasoning. The ideal still is to have a synoptic view without dogmatism.

This should suffice for a context. It is not meant to be an endorsement of any of the ideas here appreciatively ascribed to Mediaeval thinking: its obeisance to ancient writers, especially Aristotle, is improper, however understandable it is, and however understandable was the effort to harmonize all revered texts: Scripture and Aristotle, Plato and Aristotle, Archimedes and Aristotle. The spell of revered texts was broken when the disposition to harmonize them was overcome by Copernicus, who noted the disagreement between the Ancients about astronomy, and by Bonamico, Galileo's teacher, who declared (contrary to St. Thomas) that Archimedes is inconsistent with Aristotle. All this is systematically ignored due to the Baconian prejudice against controversy and Marxist historicism which places the Middle Ages nicely above antiquity and below modernity both economically and intellectually.

2. BETWEEN RATIONALISM AND FIDEISM

The basic problem of the context of any discourse in the history of philosophy

concerns its changing presuppositions. Modern philosophers, from Descartes to Husserl, declared that all presuppositions to philosophy are doubtful, and render doubtful its very rationality. These philosophers are the classical rationalists. Other philosophers say, as classical rationalism is impossible, one must endorse some presuppositions in a leap of faith, so as to restore rationality. These are the fideists.

By their own precepts, fideist may assume whatever they wish as the preconditions for philosophy, and they usually assume the religion of their forefathers, thus reconciling the demand for a universal code of logic with their particular heritage. Does the converse hold? Does taking religion for a precondition for rationality brand one a fideist? Since the Mediaeval thinkers, from Al-Farabi on, took religion to constitute such a precondition, were they all fideists? This is a great difficulty. The existence of humanity is inescapably such a precondition. Descartes knew this and to avoid it he began with doubting even human existence, which he found in need of a proof; the proof is his famous slogan, I think, therefore I exist. His logic here is weak. Rather than fix it, today philosophers prefer an evolutionary explanation of our existence. Is the evolutionary hypothesis thus a precondition for philosophy?

The current literature on Maimonides takes it for granted that he was a classical rationalist or a fideist (Yovel, 1986). By the same toke, this holds for other Mediaeval thinkers: limiting the choice for all of Descartes' predecessors to that between classical rationalism and fideism, dooms them all to fideism, since they all took the certitude of theology for granted. If we insist on the strict demand to have no presupposition, then, since Descartes was the first to suggest that we should avoid the presupposition of our very existence, all philosophers prior to him took their own existence upon faith; hence they were all fideists. This conclusion is absurd: they never recommended a leap of faith and they discussed rationally their presuppositions to the extent that they were at all aware of them. Hence more options are needed than between classical rationalism and fideism.

What other options are there? This question falls between stools. The chief irrationalist arguments against rationalism is the inevitability of presuppositions for philosophy, especially the existence of a social order (which includes a religion). Rationalists follow Descartes, oblivious of the social order. Yet we need not be ultra-modern to have our attention drawn to it; after all, Socrates of the *Crito* and of the end of the *Phaedo* took it for granted.[5] Descartes admitted it when he decided to conform to convention as a stop-gap before he constructed the elements of his philosophy.

Is this position of Descartes consistent with his demand for no presuppositions? This is a difficult question; probably it is not decidable. He did not think that this way he was violating a rule, any more than that his being a faithful Roman Catholic was. Was he right? It is hard to say: it is one thing to take one's religion for granted, with or without justice, consistently or not, and quite another thing to hold the view that religion is for the ignorant and to conceal this. This is Machiavellism. It should be spelled out clearly: it is not the trivial view that religion is a political tool: it is the view of religion as nothing but a

political tool. Perhaps it is more: perhaps it is the view of religion as a political lie. This makes Plato the first Machiavellian. Advocating religion only for the uneducated Machiavellian. The view of Maimonides as advocating this is the view of him as Machiavellian. The view of Maimonides as Machiavellian is common.[6]

It is difficult to read Mediaeval thinkers without anachronism, without erroneously ascribing to them ideas which we take today for granted.[7] In order to try and avoid this error, it is advisable to attempt a comprehensive view of every one of these thinkers, and see what they shared and what they disagreed about and why. This is what Kraemer has tried as he discussed Maimonides' earliest text and its impact on his later works. He says (1991b, 99),

> ... both Wolfson and Strauss contended that the governance of the pagan nations and the governance of Israel (Wolfson), or of any group constituted by a universalistic religion (Strauss), was governance by a religious polity, in contrast to the civil polity of cities. But the real distinction in our text is between the bygone nations that were governed by *nomoi* on the one hand and people 'in these times' who are governed by divine commands on the other. There is no reason to believe that the *nomoi* of the ancient nations are religious laws; on the contrary, the clear implication is that they are not.

Kraemer rejects Strauss' claim that 'the function of the Torah is emphatically political': his claim that Maimonides was Machiavellian is unacceptable. Kraemer offers an alternative: according to Maimonides the *nomoi* (Greek laws) suffice for law and order, and this justifies them in general but since they are mere conventions, they cannot be rationally justified in detail. This relates to the two greatest difficulties that Maimonides had to face. The one has to do with the fact that Jewish law is not natural. He solved it by reference to the sacred as being above the natural, which is question-begging, of course. The second is the historical fact that secular philosophy preceded its religious heir, contrary to the inner logic of the answer to the first difficulty, and contrary to all Mediaeval philosophy. The answer to this question is that law and order suffice for the beginning of inquiry, but its full expression is within religion.

This is not satisfactory, but it may suffice: perhaps it permits the rise of civil society with no revelation, but it does not explain why this is what has happened. Maimonides and his peers had no answer: they all said, the answer is beyond the limit of reason: we cannot understand miracles, including creation, revelation and the divine choice of time, place, or the individual or nation subject to revelation. This, again, is question-begging. Mediaeval philosophy is both political and religious. For, implicit here is the affirmative answer to the question, which philosophy is more rational, religious or secular? No matter what the right answer to this question is, is not at issue; the question is, can one choose religion without loss of commitment to reason.[8]

Now the interest in this discussion is that is spills over to a discussion of Maimonides' epistemology. He clearly said, religious philosophy is more rational than secular philosophy; commentators other than Kraemer ignore

this: the extant, post-Cartesian views of rationality exclude Kraemer's option: a new reasonable historical framework for it is thus needed, which will allow for a rational choice between different religions. The central interpretative question which Kraemer presents here, then, is, which views did Maimonides share with his Muslim predecessors? It is a central question in the (secular) study of any text related to Maimonides' philosophy. Yet, if Kraemer is right, then there is no way to approach it unless the new interpretation will be seen as superior to all others thus far suggested, though, hopefully, it too will be superseded.

The new interpretation, then, is the idea that we consider rational any set of preconditions for rationality, and as different from fideism, since it allows the comparison between different options and possibly a rational choice between them.

Kraemer views Maimonides' works as a whole; using his earliest text – on logic – to throw light on his whole outlook. In that work Maimonides endorses the classification of the sciences of the leading Muslim philosopher Al-Farabi. This classification, says Mahdi (1975, 144), hides a new revolutionary idea: it opens a new program; 'political science now coexists with jurisprudence and theology.' This idea, adds Kraemer, was taken over by Maimonides in his first, youthful work. Al-Farabi's classification of the sciences offers the clue to the ability, as perceived at the time, to harmonize universalism and particularism; Maimonides' early advocacy of Al-Farabi's classification of the sciences is the key, as it introduced logic as a universal grammar, playing down the grammar of particular languages (Abed, 1991, *passim*, contrary to Zimmermann, 1981, p. cxxxix).

Commentators understandably centre of Maimonides' relation to Judaism, since he had to harmonize universalism and his own particular faith. Yet the conflict is general, and, as Kraemer stresses, it is at least pertinent to examine the Muslim context in which Maimonides worked, especially since he was frankly a follower of Al-Farabi (Berman, 1974). There are two questions here. First, how should my faith harmonize with reason? Second, of the extant religions, which is the most rational? Maimonides moved the discussion from the first question to the second. In surmounting the impatience with religion Kraemer found this progress.

3. THE STRIVE FOR A UNIVERSAL RELIGION

All over the western world universalism inhabits particular societies that possess their own particular cultures. This causes a tension that appears first in learning, and then spills over to religion, to the culture at large, and so to local politics. The bone of contention between those who took religion as more basic and their critics concerned equality: if all humans are equal, then there is no need for revelation. But even then, whence the excellence of the ancient Greeks? It is not surprising that most non-religious universalistic philosophers praised the common people and were hostile to the state, and most others, including Al-Farabi and Maimonides, spoke disparagingly of the common people: their hostility to philosophy calls for ignoring them when writing

philosophy. By default this made the defense of religion approval of the established order.

The religious philosophers were not adverse to presenting Machiavellian arguments (Kraemer, 1984a, 161), as long as it is understood as second best to the truly religious state, the world state. This was an ideal that had secular and religious variants. Al-Farabi incorporated the secular variant within religious philosophy and Maimonides endorsed this move. It was the source of the effort to unify theology and science. Al-Farabi derived his universalism from the idea of humanity as political and of the political as beginning with the smallest association and ending with the universal state. (This is possibly why Maimonides endorsed Al-Farabi's quasi-mystic idea of the human as a miniature replica of the universe and of the deity as the soul in nature.) Kraemer views (1991b, concluding paragraph) the expression of piety in the *Guide* as sincere; Maimonides took the correctness of the articles of the faith as essential for the success of the great political venture of the establishment of the world state: Judaism is better suited than Islam to serve as this ideal (Kraemer, 1979, 151).

This does not resolve the tension between universalism and particularism since in order for the tension to reduce the Kingdom of Heaven must come, and for this knowledge of philosophy must be spread.

How did philosophers cope with the tension? One may be sincerely and uncritically both a particularistic and a universalistic. This is a priori unacceptable for the philosophers here discussed. But clearly they all felt the tension between faith and reason, between particularism and universalism, and they tried to resolve it as best they could, which is to say, not well but still honorably, and without being casualities to the charge of all-out Machiavellism. This should suffice; expecting more is unreasonable.

The charge of all-out Machiavellism comes from an oversight of historical factors: it is not that theology was admitted to philosophy, possibly as a Machiavellism move, but that philosophy was allowed in as the claim of the unity of theology and (natural) science, the theme of Maimonides' *Guide*. Commentators of late Antiquity, observes Mahdi, did not even notice the political character of Plato's eminently political writings. Politics entered through the political background: things changed with the mellowing of Islam that was a clerical, fairly tolerant, fairly universalistic regime. The vision of a world state under Islam in the near future was already expressed by its founders. The defense of it as the most rational of all visions is barely resistable, and it was at once sought by Muslim rulers (Ess, 1975). Al-Farabi developed it into a philosophical system.

The first step in this direction was a new classification of the sciences, in which philosophy is no longer the handmaid of theology. The classification presents the sciences in five stages, metaphysics together with physics being the fourth, and the fifth being politics, jurisprudence and dialectical theology. Like theology, philosophy was included under politics, as it is the attainment of peace of mind and thus of happiness, which the (ideal) state is obliged to cater for. This is not to deny theology its independence, but to view it as inherently political, and political theology is then an intensified version of political

philosophy. This is clearly a very significant move. Al-Farabi aimed at a philosophy fit for practical government and for the Muslim world, and yet also one aspiring to be the Kingdom of God. (See Najjar, 1961; Kraemer, 1797, 109; Gellner, 1981, 44; Galston, 1990, Chapter 3, especially section A, and references to Pines, 1963.) He refused to accept all-out Machiavellism, though he was ready to endorse some limited Machiavellian moves for popular consumption. Maimonides fully supported him. Al-Farabi spoke of religion in general; Maimonides codified Jewish law as the next step forward.

The tension between particularism and universalism was (and still is) serious regardless of convictions for or against faith; Al-Farabi had an idea that Islam may offer a resolution of the tension by becoming a truly universal state here and now; Maimonides endorsed this idea with the modifications needed for his substitution of Judaism for Islam.

This makes his abolition of animal sacrifices not a mere intellectual exercise but the improvement needed in order to present Judaism as a perfect viable option for salvation. Similarly, his famous discourse on the Laws of Kings was not meant as a mere intellectual exercise, despite what most commentators take for granted (Ravitzky, 1991), but an expression of his view of political possibilities (Kraemer, 1984b). This is why he insisted, also, that the Muslims are not heathens: it opens the road to treating them as Jews of sorts, perhaps leading to their massive conversion to Judaism. As Kraemer notices, the point that Muslims are monotheists opening the road to treat them as Jews is attractive. In the *Code* (Laws of Kings), where he discusses the seven laws of the sons of Noah, he proposes that Muslims should circumcise males on the eighth day according to the law of Moses, presumably assessing it possible that his proposal might be accepted: this is a part of his insistence that Muslim law is a corrupt version of Judaism (Kraemer, 1986). This also explains the end of his *Guide* where Judaism is praised for its not being monastic. Finally, this also explains his intense concern with the political problems of different Jewish communities, perhaps also his earnest prejudice against Jewish communities in the Christian world.

Kraemer observes (1984b) that a messianic fervor was common in the age. Looked at in this light, Kellner's reading of Maimonides as a universalistic simpliciter, though unsatisfactory, may offer the right clue: Maimonides presumably saw the messianic age not in the distant, unreachable future, so that the division between Jew and Gentile will soon abate. In Maimonides' opinion the likelihood of Jewish autonomy rested on the hope that the Islamic world will endorse Al-Farabi's recommendation to alter its ideology slightly so as to become universalistic, and then it will follow Maimonides' recommendation and become perfect.

What does the messianic age amount to? Possibly it is nothing but political independence, possibly of a state governed perfectly by Jewish law. Possibly it is eschatological, in line with a number of eschatological biblical passages. And it can be anything in between. Kraemer's view is that it is the Platonic ideal civil society in the mode understood by Al-Farabi and modified by Maimonides, who also embellished it.[9]

Whether Maimonides had in mind a restoration of prophecy and advent of the Messiah and thus intended to provide the restorated Jewish state with a constitution, is anybody's guess. Al-Farabi and Maimonides saw Islam as superior to Christianity, and the Islamic state as superior to the Christian one, which is utterly other-worldly. Also, the former but not the latter was clerical: its head was both a king and a pope, and both saw this as the cause of the fact that the Muslim regime was the more tolerant to communities of other creeds. Al-Farabi himself was a student of leading Baghdadi Christian scholars who, Mahdi tells us (1983, 22), belonged to 'the school of Alexandria, where philosophy survived despite the restrictions imposed by the church authorities.'[10]

The basis of this judgment is the view of religion as the foundation of civil society. What is the best religion, then, can be judged by the criteria of dialectics. This does not resolve the tension between universalism and particularism, but it might – on the assumption that my religion is rational and will become universal one day, when its rationality will win it universal assent.

The most telling aspect of Maimonides' *Code* is its ruling on violence. As he took seriously the idea of the law as justified by the need for a civil society, he made two astonishing reforms: he adjudicated that in war all law is unconditionally suspended; and he recommended that capital punishment should be reinstated. Bildstein notes (1991, esp. 216ff) that his view did not accord with Jewish tradition but was 'dovetailed' to fit the edicts of Jewish Law regarding Gentiles. A comprehensive view of Maimonides should relate to this background, and in consideration of his messianic fervor.

The chapter intended to be the last in the *Guide* (it was later supplemented with two more) includes a fable that is the basis of Franz Kafka's 'Great Wall of China' which reports the difficulty one has approaching the king. It conveys the atmosphere of a tremendous yearning for salvation, showing that Maimonides retained both deep faith and great doubts as to the great vision of his youth of Judaism soon becoming a universal religion.

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NOTES

* I am grateful to Joel L. Kraemer for his thoughtful, careful, and very useful comments.

1 Maimonides' expression of indebtedness to Al-Farabi is well known. His debt to Al-Ghazali is noted by his commentator, Moses of Narbon (Altmann, 1988, 155), probably in order to discredit what he said on creation, on which, Narbon suggested, he had followed Al-Ghazali. We need not enter the intellectual politics of the matter.

2 Plato required that the study of dialectic should be restricted to students past forty; the Talmud applies this to esoteric studies and adds the demand that the teaching should be one to one.

3 Perhaps an outsider like myself should not give account on complex, controversial matters such as the meaning of *kalam*. It is presented here in a lamentably simplistic manner, with *fiqh* as deductive and *kalam* as inductive: the premises of *fiqh* are taken to be self-evident, true axioms whose truth is transmitted to their conclusions, whereas the conclusions of *kalam* are taken to be errors whose falsity refute the (popular) premises from which they follow; except that in fact the

inferences in question are scarcely logically valid ones. The comparison of *fiqh* and *kalam* is incomplete without the discussion of the *shari'a* (*Kur'anic* law) or its Jewish equivalent. Also, the contrast between *kalam* and *falasifa* is relevant here; it is a most difficult item, outlined in the careful and comprehensive study of Sabra, 1994. In addition to these limitations, my presentation is very inaccurate: my suggestion that Maimonides' *Guide* is *kalam* and his *Code* is *fiqh* is correct only in a broad manner. Finally, I have not dealt with the important observation that Medieval texts are generally unclear, that the highest esteem for the clarity and boldness of Maimonides' style should not cloud the fact that as a follower of Aristotle he could not begin to approach the clarity that modern logic provides.

[4] The nearest Pines gets to an explitic general discussion of the conflict between faith and reason is the Appendix to his (1979), where he discusses the strange fact that seemingly Maimonides viewed religion as a greater obstacle to [secular] learning in his own time than in Antiquity. 'This is difficult to reconcile,' he says (101), 'with Maimonides' well-known position according to which the hints given in the Scriptures ... help ... to achieve true knowledge.' And he cites there (102) Averroes to say, 'men can only become perfect in society; and society is only possible through virtue.' Pines ascribes to Averroes the view that Muslim education was more prejudicing than pagan, and he suggests that Maimonides came to the same view on his own. The matter invites more discussion than I can undertake, but one need no subtlety to see here how unwilling Maimonides was to limit individual autonomy.

Berman, 1974, n. 51 offers a legalistic view of the matter of the conflict, which restricts the discussion to Jewish Law. He overlooks Maimonides' effort at universalism and he sees here the only deviation from his own thesis that Maimonides was a close foller of Al-Farabi. In my view Maimonides' deviation was smaller: he saw Judaism, not Islam, as the superior religion.

[5] See Jaeger, 1945, 1965, Chapter 6, notes 38 and 40, for his discussion of the import of myth of the divine origin of the laws in Plato's *Laws* and for his (Jaeger's) rejection of the sophists' dichotomy between nature and convention. This is not serious but it shows awareness of the difficulty. It also explains why the dichotomy, which is so central to Plato's works, had to be rediscovered by John Burnett and by G.C. Field (Agassi, 1977, 225–6).

[6] Sadly some commentators on religious texts show little respect for religion; some of them share the faith defended in the texts which they scrutinize and their disrespect is then the unintended outcome of their defensiveness.

[7] Pines called Maimonides' philosophy 'critical-in-quotation-marks' (1979, 94): like Kant he was a rationalist who assumed that reason is limited. The label indicates a certain unease as to how to view Maimonides from a modern perspective. In opposition to Pines, Friedman (1992) claims that Kant is closer to the *kalam*, the target of Maimonides' critique. This disagreement is not taken up here.

[8] Kraemer notices (1984b, 133) that according to Maimonides the Jews lost national independence because of the pseudo-science of astrology, which is the gateway to idolatry and thus to the loss of individual autonomy. Here, clearly, Maimonides adjudicates that a Jew is obliged by law to be a committed rationalist.

[9] The scholarly literature on the message of Plato's *Republic*, in the Middle Ages and today, is identified with the messages commentators endorse. For details see Popper, 1945. Why has no expert in Medieval studies crossed the boundary to the classicist, educational and political literature to say that Popper's reading of Plato is nearer to old traditions than today's canonic reading?

[10] This is contested; see Galston, 1990, 17 and reference to Zimmermann, 1981 there.

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APPENDIX ON MAIMONIDES AND THE COPERNICAN REVOLUTION

A growing literature is devoted to the influence of the medieval neo-platonic tradition, of light-mysticism so-called, on the rise of modern science, particularly on the Copernican revolution. This tradition has its origin in the Jewish literature known as the Cabala, that evolved soon after Maimonides' influence was established. The parallel between the spheres in the Cabala and in medieval astronomy is obvious. Gershom Scholem, the leading student of the Cabala,

took great pains to deny the parallel any scientific import, since the Cabalists were interested not in astronomy but in its secret meaning, and because science is based on empirical evidence and not on wild, quasi-magical speculations. (He viewed the Cabala as idolatrous.)

Nevertheless, Copernicus did accept the Cabalist view of the sun as a symbol of the king and deemed the proper place of the king to be in the center of the court. Moreover, the Cabalist doctrine of Emanation says, the Lord's kindness emanates in sparks issuing from the *primum mobile* and reaching earth unless they are entrapped in the shells. The shells of the spheres are thick as they accommodate epicycles, and presumably this is why it was so important to remove the epicycles. Also, since fate is in the stars, the way prayer helps is by its influence on the heavens.

What all this magic has to do with the influence of Maimonides is a matter of speculation. Maimonides' *Guide* was meant to grant legitimacy to physics in general and astronomy in particular as a proper topic for concern for a Jewish scholar. According to Moshe Idel, the heir of Scholem as the leading student of the Cabala, the influence of Maimonides legitimized astronomy and this allowed for the rise of the Cabala. The influence of the Christian versions of the Cabala on the astronomical revolution is then a strange devious story that sheds some light on the background to the story of the growth of modern science out of medieval magic. It should be noted, however, that Maimonides himself was extremely hostile to all versions of magic and more so to astrology.

DANIEL H. FRANK

"...WITH ALL YOUR HEART AND WITH ALL YOUR SOUL...": THE MORAL PSYCHOLOGY OF THE *SHEMONAH PERAQIM*

Like Aristotle, Maimonides' moral theory, his theory of the human good, rests upon a view of human nature. For both philosophers, the nature of man resides in his *peculiar* psychic capacities, those which he shares with no other species. For Aristotle, the human soul is distinguished by virtue of its rational capacities. These alone distinguish human beings from plants and (non-human) animals. In his famous '*ergon*' argument at *Nicomachean Ethics* (*NE*) I.7 (1097b22ff), that argument which defines the human good by reference to the proper functioning of the peculiarly human psychic capacities, Aristotle points out that, given that nutrition and growth are shared by all living beings and, further, that sense perception is shared by all animals, both human and non-human, the human good cannot reside in the proper functioning of the nutritive and/or perceptive capacities.[1] What remains, and that by which man can be said to achieve his *telos*, his characteristic goal, is the proper functioning of his ratiocinative capacities. A life manifesting reason is the best life for man.

From this "outline" (*perigegraphtho*, 1098a20) of the human good, Aristotle embarks in due course upon an analysis of human reason, both theoretical and practical, and its virtues, both intellectual and moral. For our purposes, however, what is important to note is that it is reason, and reason alone, which serves to distinguish humanity from all other life forms. And it is upon the proper functioning of reason that Aristotle founds his ethical theory and his view of the human good.

As I have shown elsewhere, Maimonides shares much with Aristotle in moral philosophy.[2] The celebrated doctrine of the mean is common ground, as are the distinctions between theoretical and practical wisdom and intellectual and moral virtue. But this common ground should not obscure the fact that Maimonides grounds his moral theory and view of the human good, at least in its earliest formulation in the *Shemonah Peraqim*, upon an *un*Aristotelian theory of the human psyche. In this paper I present this unAristotelian moral psychology as it appears in the *Shemonah Peraqim*, Maimonides' introduction to his commentary on *Avot* in his (early) *Commentary on the Mishnah*. In so doing, I shall consider the background of his theory and some implications of it.

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 25–33.
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MAIMONIDES' THEORY AND ITS BACKGROUND

Both Aristotle and Maimonides agree that he who wishes to learn of the human good with a view to sustaining or improving the moral habits of himself and others must first gain an understanding of the human soul.[3] Like the doctor who cures the body needs a thorough knowledge of the human body, so he who ministers to souls, curing the depraved and sustaining the upright, must possess a thorough knowledge of the human psyche.[4] It is in this (practical) context that Maimonides begins to present his view of the human soul in the first chapter of the *Shemonah Peraqim*. We will do well to have the passage before us:

> ... there are five faculties of the [human] soul: the nutritive, the sentient, the imaginative, the appetitive, and the rational. We have already indicated in this chapter that our discourse is about the human soul because man's nutritive faculty is not the same as the nutritive faculty of a donkey or a horse. For man is nourished by the nutritive faculty of the human soul, a donkey by the nutritive faculty of the donkey's soul, and a palm tree is nourished by the nutritive faculty peculiar to its soul.[5] Now, all these individuals are said to be "nourished," but by equivocation. Similarly, man and beast are said to be "sentient," but by equivocation, and not because the sensations of one species are the same as that of another. *[In sum], each species has its own characteristic soul distinct from every other [species]. Consequently, there arises from each [type of] soul activities peculiar to itself.* (tr. after Weiss/Butterworth; emphases and interpolations mine)[6]

This, then, is the crucial beginning of Maimonides' discussion of the human psyche. It is a major portion of the knowledge which the 'physician' of the soul, the wise man,[7] will base his (moral) regimen upon.

Given the (moral) context within which Maimonides' psychological remarks are nested, it is immediately seen that he, like Aristotle, links an understanding of the human good and a program for its attainment with knowledge of the human psyche. Unlike Aristotle, however, for Maimonides the human soul is totally idiosyncratic – each one of its faculties, the nutritive, sentient, imaginative, appetitive, and rational, is peculiar to the human species. For Aristotle, it will be recalled, the human soul *shares* the 'lower' faculties, specifically the nutritive and perceptive facilities, with non-human animals. For Aristotle, man is a rational *animal*, the highest being in the natural order. Not so, for Maimonides. For him, man is not an animal in any way. He shares no psychic capacity with other forms of animate life.

Maimonides' psychological theory and the roots of it have excited little concern in recent literature. Herbert Davidson, in the context of a comparative study of Maimonides' *Shemonah Peraqim* and Alfarabi's *Fusul al-Madani*, is content to point out that the passage at hand has no Farabian parallel.[8] And it is true (and, perhaps, curious) that in the *Shemonah Peraqim*, a work indebted to Alfarabi's *Fusul*, even to the point of plagiarism,[9] Maimonides' remarks

about the idiosyncrasy of the human soul have no Farabian parallel;[10] indeed, Maimonides' remarks about the idiosyncrasy of the human soul form an interpolation, as it were, within Alfarabi's *fasl* #6, between Alfarabi's enumeration of the parts of the human soul (which Maimonides adopts *in toto*) and his (immediately following) descriptions of each part (which Maimonides quotes in large part almost verbatim).

More recently, Marvin Fox, in the context of his comparative study of Aristotle's and Maimonides' doctrine of the mean, has attempted to locate the background to Maimonides' unAristotelian view of the human psyche.[11] For Fox, Maimonides' position is ultimately to be traced to the (other) major tradition to which he was indebted, the biblical tradition.[12] Fox writes:

> ... with respect to their understanding of psychology and the nature of man they [Aristotle and Maimonides] diverge very significantly ... [For Maimonides,] man is not simply an animal, in all respects, with the addition of the faculty of reason. Man is absolutely distinct from animals, even with regard to those faculties that constitute what we usually call his animal nature ... In the last analysis, it could not be otherwise; for if man is conceived as created in the image of God, he can no longer be understood as one more animal living in the order of nature ... In all respects man is now viewed as different from animals, and his ideal end, i.e. *imitatio Dei*, encompasses not only his reason, but all of his peculiarly human faculties.[13]

For Fox, then, Maimonides' non-(even anti-)Aristotelian position depends upon, indeed manifests, the biblical view that humans, and only humans, are created in the image of God (*Genesis* 1:27). Consequently, Fox argues, the human being is unlike any other creature in nature, and Maimonides' way of underscoring this latter point is the doctrine of 'psychic idiosyncrasy' of *Shemonah Peraqim* I.

I am not sure whether to agree with Fox that the biblical tradition stands behind Maimonides' psychological theory. But in any case, I dissent from his specific view that the doctrine of *Genesis* 1:27, that humans alone are created in the image of God, provide the grounds for Maimonides' doctrine of the idiosyncratic nature of the human psyche. My basic disagreement depends upon Maimonides' own interpretation of the *Genesis* passage in question. In the first chapter of the *Guide* Maimonides interprets *Genesis* 1:27 as signifying that man is made in God's image (*b'zelem*), insofar as he shares with God a rational faculty.[14] But nothing is said or implied about any *other* capacities which may (or may not) be peculiarly human and non-bestial. For all that he says in the *Guide*, Maimonides' theory of the human psyche is no different than Aristotle's.[15] Furthermore, the *Genesis* passage presupposed by Fox would seem to be suspect because it delineates, according to Maimonides' interpretation of it, that single human capacity, reason, which we *share* with God. But the doctrine of psychic idiosyncrasy suggests that the human psychic capacities are not merely non-bestial, i.e. not shared by humans and (any of) the non-human animals, but also are non-divine, not shared by humans and God. Again, the

peculiarity of the human psychic capacities is just that – peculiar to humans. In sum, granting for the moment that the biblical tradition stands behind Maimonides' psychological theory, the *Genesis* passage underlying Fox's argument cannot support that theory as we find it in the *Shemonah Peraqim*.

As an alternative to Fox, I suggest the following: In *Shemonah Peraqim* V Maimonides' subject is the *summum bonum*, the goal to which all human actions ought to strive.[16] The goal is "knowledge of God, insofar as that lies within man's power." For Maimonides, such a goal, though intellectualist in nature, cannot be achieved without directing *all* of one's actions, however mundane, toward the end. Maimonides asserts:

> A man should direct all his actions ... and all his conversation towards this goal [apprehension of God], so that none of his actions is in any way frivolous. For example, he should make his aim only the health of his body when he eats, drinks, sleeps, has sexual intercourse, is awake, and is in motion or at rest. The purpose of his body's health is that the soul finds its instruments healthy and sound in order that it can be directed toward the sciences and toward acquiring the moral and intellectual virtues, so that he might arrive at the goal.[17]

It is such 'instrumentalism,' not in itself unGreek, that provides Maimonides' interpretation of *Deuteronomy* 6:5, the imperative that "You shall love the Lord your God with all your heart and with all your soul ..."

It is this Deuteronomic imperative, interpreted as meaning that man must order *all* his actions and *all* his psychic capacities toward knowledge and love of God,[18] which I suggest may provide a grounding for Maimonides' psychological theory as we find it in *Shemonah Peraqim* I. Only humans have the capacity to direct *all* their characteristic actions, even the most mundane, toward the goal of knowledge and love of God. And given this, Maimonides might well conclude, on the basis of *Deuteronomy* 6:5 (and like passages in *Proverbs* 3:6 and *Avot* itself, at 2:17), that the human soul and its characteristic activities are different in *every* way from that of (non-human) animals.

In a sense, Fox is correct to point to man's rational capacity, via *Genesis* 1:27, as being fundamental for Maimonides' moral psychology. The self-conscious goal-directedness of human action is explicable only because of man's rational capacities. Nonetheless, this will not serve to explain why Maimonides would imagine that the non-rational psychic capacities are non-bestial, not shared by the other animals except in name. After all, Aristotle, who likewise distinguished man by virtue of his rational capacities, had no qualms about viewing man as in *other* ways an animal. At the conclusion of this essay, I shall consider whether we may understand Maimonides' organic, 'holistic,' psychological theory as a response to problems that beset an Aristotelian view that understands the human agent as half man, half beast. For the moment, let us just understand that for Maimonides, the goal to be achieved, knowledge of God, cannot be attained without the careful training of *all* of our psychic capacities. And the fact that they can be trained to such an ultimate goal gives

Maimonides a reason to conclude that *all* of man's psychic capacities are distinctly non-bestial, not shared, except homonomously, by the animals.

SOME IMPLICATIONS OF MAIMONIDES' THEORY

This latter point, the necessity and possibility of ordering all our psychic capacities toward knowledge of God, accounts for why medicine and health, bodily health, are of such vital concern for Maimonides, at least as much as they are for Aristotle, in the attaiment of the human good. For Maimonides,

> ... the art of medicine is given a very large role with respect to the virtues, the knowledge of God, and attaining true happiness. To study it [medicine] diligently is among the greatest acts of worship..., for it enables us to perform our actions so that they become human actions, leading to the virtues and truth. For if a man sets out to eat appetizing food which is pleasant..., but is harmful and could be the cause of illness, then this man and the beasts are alike. That is not the action of a man insofar as he is a man. Indeed, it is the action of a man insofar as he is an animal ... The proper goal for all of one's conduct is the body's health and prolonging its existence in a sound manner in order that the instruments of the soul's powers – which are the organs of the body – remain sound. Then the soul can be directed toward the moral and intellectual virtues without any obstacle.[19]

The fact that physical health, the goal of medicine, is a *duty*[20] follows directly for Maimonides from the Deuteronomic imperative to "love the Lord your God with all your heart and with all your soul ..." For Maimonides, no human activity or capacity is insignificant for achievement of the final goal, knowledge of God. And given this, Maimonides stresses over and over again the importance of physical well-being and, correlatively, that there is a human way to be and to act and, contrarily, that there is a bestial way. As Fox asserts: "... the [Maimonidean] physician of the soul ... is not training man on the analogy of training a dog or a horse. He is rather directing a human soul, *in its totality*, toward the divine ideal."[21]

This theocentric goal-directedness of all of man's capacities and activities has an interesting corollary. It entails the actual breakdown of the medical analogy to which Maimonides appears to be committed in the first chapter of the *Shemonah Peraqim*. There, in good Aristotelian and Farabian fashion, Maimonides asserts, as we recall, that there is a direct correlation between the doctor and his curing of the body on the one hand and "[he] who treats the soul and wishes to purify moral habits."[22] This might have led one to suppose that the ills of the body and the 'ills' of the soul, treated as they are by different professionals, are incommensurable. Moreover, we might have thought that the 'health' of each was an end in itself. On both counts we would be wrong, for in the final analysis bodily health is subsumed under the moral imperative, the Deuteronomic command, and is in fact a prerequisite for any kind of moral or

intellectual perfection. To wit:

> If one conducts himself in accordance with the [art of] medicine and sets his heart only upon making his body and limbs perfect and strong ... this is not a good way. Rather, he shall set his heart upon making his body perfect and strong so that his soul will be upright to know the Lord. For it is impossible for him to understand and reflect upon wisdom when he is sick ... (*Hilkhot De'ot* III.3; cf. *Shemonah Peraqim* V and *Guide* III.27)

This instrumentalism provides the reason why "medicine is given a very large role with respect to the virtues, the knowledge of God, and attaining true happiness." I shall resist the temptation to speculate as to whether this thought explains why Maimonides chose medicine as his profession.

In sum, then, the breakdown of the medical analogy, and with it the denial that there is a gross distinction to be made *within* man between his animal nature and his rational nature, gives Maimonides reason to believe that all of man's psychic capacities, even the lowest, are peculiar to the human species, sharing no common factor with non-human animals. Only humans are possible agents of the Deuteronomic imperative. Only they can so direct all their actions to the divine ideal.

CONCLUSION: ARISTOTLE AND MAIMONIDES ON HUMAN NATURE

In conclusion, it should be noted that Maimonides' 'holistic' psychological theory, his view that *all* of man's psychic capacities are peculiarly his own (i.e. human) and that man is *not* half man, half beast, as it were, may be understood as some kind of response to Aristotle's psychological theory. The latter's theory, which locates the essence of man in his rational capacities[23] and the human good in the proper exercise of those rational capacities, leaves unresolved what role, if any, the non-cognitive faculties play in the determination of man's essence and the structure of the human good. As a result of this irresolution about the 'status' of the non-cognitive faculties, Aristotle is saddled with a deeply ambiguous view of human nature. Is man a composite creature, a conjunct of body and soul, or rather, is he (identical to) his *immaterial* soul (and its activities), and without reference to his body? Aristotle has arguments for both positions. On the one hand, the practical life of moral virtue reveals man as a composite creature (a *suntheton*, at *NE* X.7 [1177b28–9], X.8 [1178a20]), a conjunct of body and soul, harnessing appropriate desires to requisite goals. But on the other hand, the life devoted to *theoria*, rational contemplation of the highest order, reveals the human being as identical with the divine, *immaterial* part of himself (X.7 [1178a2–4]), specifically that rational faculty which engages in contemplative activity. For Aristotle, thus, his psychological theory and irresolution about the status and role of the non-cognitive faculties in a determination of man's essence entails a puzzle about the identity criteria for a human.[24]

However Aristotle solved this puzzle and, for that matter, whether he ever

solved it, the problem does not arise for Maimonides. And it does not arise for the simple reason that, at least in the early stages of his philosophical career – at the time of writing the *Shemonah Peraqim* – there is for Maimonides no *exclusion* of *any* of man's psychic powers from being determinative of his essence, his 'humanity.'[25] Unlike Aristotle, for whom the 'lower,' non-cognitive psychic capacities are problematically part of man's essence and questionably related to his *telos*, Maimonides does not worry about the possible 'animality' of man's non-cognitive capacities. Consequently, he has no qualms about accepting *all* of man's peculiar psychic capacities as 'human,' as constitutive of his being, and the actualization of them all as necessary conditions for attaining knowledge of God, the human good.[26]

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NOTES

1 Cf. *NE* I.13 (1102b2–12); *Eudemian Ethics* II.1 (1219b37–40).

2 "The End of the *Guide*: Maimonides on the Best Life for Man," *Judaism* 34 (1985); "Humility as a Virtue: A Maimonidean Critique of Aristotle's Ethics," in *Moses Maimonides and His Time*, ed. E. Ormsby (Washington D.C.: The Catholic University of America Press, 1989); "Anger as a Vice: A Maimonidean Critique of Aristotle's Ethics," *History of Philosophy Quarterly* 7 (1990).

3 Aristotle: *NE* I.13 (1102a18–26); Maimonides: *Shemonah Peraqim* (*SP*) I.

4 Note that for Aristotle the 'doctor' to the soul is the politician-statesman (*ho politikos*, at *NE* I.13 [1102a18–19]; cf. Alfarabi, *Fusul al-Madani*, *fasl* #4), while for Maimonides, it is the wise man (*'alim* [pl. *'ulama'* at *SP* III]/*hakham*). For some thoughts on the reason for this difference between Alfarabi and Maimonides, a difference which is more than terminological, see H. Davidson, "Maimonides' *Shemonah Peraqim* and Alfarabi's *Fusul al-Madani*," *Proceedings of the American Academy for Jewish Research* 36 (1963), 47–50.

5 Cf. Avicenna, *De Anima* V.7: 260 (ed. F. Rahman).

6 In *Ethical Writings of Maimonides* (trs. R. Weiss and C. Butterworth), New York: Dover, 1983. Translations from *Shemonah Peraqim* and *Hilkhot De'ot* are from this volume, unless otherwise noted; translations from the *Guide* are those of S. Pines, in *The Guide of the Perplexed*, 2 vols. (Chicago and London: University of Chicago Press, 1963).

7 See note 4, *supra*.

8 Davidson, (*supra*, note 4), 37 and 41n20.

9 Davidson, 37–40.

10 This point is perhaps highlighted by Maimonides' concluding statement to the section: "Mark well this point [about the idiosyncrasy of the human soul], for it is very important, as many so-called philosophers have fallen into error regarding it, in consequence of which they have been driven to absurdities and fallacies" (tr. J. Gorfinkle, in *The Eight Chapters of Maimonides on Ethics* (*Shemonah Peraqim*), New York: AMS Press 1966). By underscoring here the importance of his own psychological theory, and doing so in the midst of literally copying Alfarabi's, Maimonides is perhaps signalling the divergence of his theory on this particular point from that of his predecessor.

11 "The Doctrine of the Mean in Aristotle and Maimonides: A Comparative Study," in *Studies in Jewish Religious and Intellectual History*, eds. S. Stein and R. Loewe (University, Alabama: The University of Alabama Press, 1979). This article is reprinted in M. Fox, *Interpreting Maimonides* (Chicago and London: University of Chicago Press, 1990); my pagination refers to the original.

12 Note, "*ultimately* to be traced ..."; a more proximate source may be Avicenna's *De Anima* V.7: 259–60 (ed. Rahman); see also ibn Daud, *Emunah Ramah* (tr. N. Samuelson), 86–7. Further, although Davidson (*supra*, note 4) does not find a Jewish context for Maimonides' psychological theory in the *Shemonah Peraqim*, he does locate a specifically Jewish context for Maimonides' (unFarabian) identification (in *SP* III) of the 'physician of the soul' with the 'wise man' (Davidson, 47–50 and note 4, *supra*).

[13] Fox (*supra*, note 11), 115–16.

[14] "That which was meant in the Scriptural dictum, "Let us make man in our image" (*Gen.* 1:26), was the specific form, which is intellectual apprehension, not the shape and configuration"; "it was because of the divine intellect conjoined with man, that it is said of the latter that he is "in the image of God and in His likeness" [*Gen.* 1:26–27] ..." (*Guide* I.1: 22, 23 [tr. Pines]).

[15] In fact, I would argue, but shall not on this occasion, that the Aristotelian position of the *NE*, which identifies man solely by reference to his rational capacities (or even more, by reference to a *particular* rational capacity: *NE* X.7 (1178a2–4) and J.M. Cooper, *Reason and Human Good in Aristotle* (Cambridge, MA: Harvard University Press, 1975), 168–77), *is* Maimonides' position *throughout the Guide*, i.e. at the end of his philosophical career; cf. *Guide* III.54: 635 (Pines), and, recently, C. Raffel, "Maimonides' Theory of Providence," *AJS Review* 12 (1987), 65–66 and H. Davidson, "The Middle Way in Maimonides' Ethics," *Proceedings of the American Academy for Jewish Research* 54 (1987), 46ff.

[16] Cf. *Hilkhot De'ot* III.2–3; *Guide* III.51, 54.

[17] Again, cf. *Hilkhot De'ot* III.2–3. quoting *Avot* 2:17: "Let all your deeds be for the sake of Heaven."

[18] Cf. *Guide* I.39: 89: "As for the dictum of Scripture: "And you shall love the Lord your God with all your heart ..." (*Deut.* 6:5) – in my opinion its interpretation [i.e. the interpretation of "with all your heart"] is: with all the forces of your heart; I mean to say, with all the forces of the body, for the principle of all of them derives from the heart. Accordingly, the intended meaning is, as we have explained in the *Commentary on the Mishnah* [in *SP* V] and in *Mishneh Torah* [in *Hilkhot De'ot* III.2], that you should make apprehension of Him the goal of *all* your actions" (tr. Pines; my emphasis); see also W.Z. Harvey, "Crescas versus Maimonides on Knowledge and Pleasure," in *A Straight Path*, ed. R. Link-Salinger et al. (Washington D.C.: The Catholic University of America Press, 1988), 122–3.

[19] *SP* V; cf. *Hilkhot De'ot* III.2–3.

[20] *Hilkhot De'ot* IV, intro.

[21] Fox (*supra*, note 11), 116; my emphasis.

[22] See note 4, *supra*.

[23] *NE* I.7 (1098a7–8).

[24] As will readily be seen, it also entails analogous puzzles about what constitutes human happiness (*eudaimonia*) and, more specifically, what role, if any, 'external' goods (e.g. wealth, good birth) and even the moral virtues play in a determination of happiness. On the one hand, " ... there are some things the lack of which takes the lustre from happiness – good birth, goodly children, beauty; for the man who is very ugly in appearance or ill-born or solitary and childless is not very likely to be happy ... Happiness seems to need this sort of prosperity ... " (*NE* I.8 [1099b2–7]); on the other hand, "happiness extends just so far as (*eph' hoson*, at X.8 [1178b28–9]) contemplation does, and those to whom contemplation more fully belongs are more truly happy, not as a mere concomitant but in virtue of the contemplation ... Happiness, therefore, must be some form of contemplation" (1178b28–32; tr. Ross). The contrast in the two passages is pointed. The first presents an 'inclusive' view of what constitutes happiness; the latter, by contrast, presents an 'exclusive' view, which seems to deny any role to anything but contemplative activity in a determination of (true) happiness. (This interpretation of the latter view is not uncontroversial; see, recently, J. Whiting, "Human Nature and Intellectualism in Aristotle," *Archiv für Geschichte der Philosophie* 68 (1986), 70–95.) The secondary literature concerning these Aristotelian moral psychological puzzles is enormous. But one can, I think, agree with T. Nagel, who writes: "It is because he is not sure who we are that Aristotle finds it difficult to say unequivocally in what our eudaimonia consists, and how the line is to be drawn between its constituents and its necessary conditions" (see "Aristotle on *Eudaimonia*," in *Essays on Aristotle's Ethics*, ed. A. Rorty [Berkeley: University of California Press, 1980], 8).

[25] But note, finally, that the holistic psychological theory of the *Shemonah Peraqim* is ultimately forsaken in favor of a more 'Aristotelian' position in the *Guide*; see note 15, *supra*.

[26] It has been suggested to me on more than one occasion that Aristotle's and Maimonides' views of the human soul are not so opposed to each other as is here being suggested. Perhaps, the objection goes, Aristotle's psychology (like Maimonides') entails that the human soul is 'human' all the way down, e.g. that human perception, 'infected' by reason, is qualitatively different from non-human perception. After all, the objection continues, the move from sense perception to knowledge, so vividly described in *Posterior Analytica* II.19, is not universally shared by all animals, and so perhaps human perception, the foundation of knowledge, is different in kind in human and non-human animals. Nevertheless, when Aristotle addresses himself to the possibility of defining (kinds of) soul (in *De Anima* II.3 [414b20ff]) and asserts that "we must inquire in each case what is the soul

of each thing, what is that of a plant, and what is that of a man or a beast" (414b32–3; tr. Hamlyn), he immediately indicates that souls (and, hence, animate beings) are *hierarchically* (*to ephexes*, at 414b33) arranged, from plant souls which have only nutritive capacities to human souls which *in addition* to nutritive and perceptive capacities have rational capacities as well. The point seems to be that 'higher' beings differ from lower ones, not because they share nothing in common (the Maimonidean view), but rather because of the addition of the 'higher' element. Now, it may be that the higher element transforms ('infects') everything below it, and in this way Aristotle's position approaches Maimonides'. But Aristotle never makes the point, and expressly denies it in the *Ethics* with respect to the nutritive/vegetative capacities, and so I let my remarks about the unAristotelian nature of Maimonides' position stand. At the very least, Maimonides may be credited with making an (*ex hypothesi*) Aristotelian doctrine explicit.

GAD FREUDENTHAL

MAIMONIDES' *GUIDE OF THE PERPLEXED* AND THE TRANSMISSION OF THE MATHEMATICAL TRACT "ON TWO ASYMPTOTIC LINES" IN THE ARABIC, LATIN AND HEBREW MEDIEVAL TRADITIONS

INTRODUCTION

In a draft written in Latin about 1692–3 as part of a planned revision of the *Principia*, Newton sought to establish that "by reason of the eternity and infinity of space" and "from the eternal succession and infinite number of his works" God "will be rendered the most perfect being." Newton was acutely aware, however, that an actual infinite is a most problematical notion. To bypass the difficulty he argued:

> I admit that an infinite number of things is difficult to conceive, and is therefore taken by many people as impossible: but there are many things concerning numbers and magnitudes which to men not learned in mathematics will appear paradoxical, and yet are entirely true. As that [...] two neighbouring bodies [*corpora*] are always able to approach one another and yet never touch each other. [...] For mathematicians know that [...] the distance between hyperbolae and their asymptotes, when they are produced, always becomes smaller but never vanishes.[1]

No one will doubt that Newton was a mathematician and a philosopher fine enough to be perfectly capable of inventing this reasoning himself. Yet it happens to be the case that Newton was only repeating a century-old argument whose most influential statement is that of Moses Maimonides, in his *Guide of the Perplexed*, written in Arabic in 1190. In the course of his criticism of kalâm epistemology, Maimonides seeks to establish the thesis that "man is not distinguished by having imagination," and that "the act of imagination is not the act of the intellect but rather the contrary." In support of this claim he says:

> Know that there are things that a man, if he considers them with his imagination, is unable to represent to himself in any respect, but finds that it is as impossible to imagine them as it is impossible for contraries to agree.

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 35–56.
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> [...] It has been made clear in the second book of the *Conic Sections* that two lines between which there is a certain distance at the outset, may go forth in such a way that the farther they go, this distance diminishes and they come nearer to one another, but without it ever being possible for them to meet even if they are drawn forth to infinity and even though they come nearer to one another the farther they go. This cannot be imagined and can in no way enter within the net of imagination. Of these two lines, one is straight and the other curved, as has been made clear there in the above-mentioned work.[2]

The argument was not original to Maimonides either: as we will presently see, it had already been stated in essentially the same form by Geminus, some twelve centuries earlier. Our main concern in this paper, however, will not be the history of the epistemlogical argument itself, but rather the history of a small tract which establishes the mathematical fact on which the argument rests. Indeed, although Maimonides was well acquainted with Apollonius of Perga's *Conic Sections* to which he refers here and may even have written a commentary on it, in point of fact in the above passage he does not directly draw on that work.[3] Instead, Maimonides is quoting the first sentence of an anonymous mathematical treatise whose Arabic original now seems to be lost, but whose medieval Latin translation has been unearthed and published by Professor Marshall Clagett in 1954 and again, with much additional material, in 1980. This is the *De duabus lineis semper approximantibus sibi invicem et numquam concurrentibus.*[4] This treatise, Professor Clagett wrote, is of particular interest since (as far as the Latin tradition is concerned) it is "the only medieval treatise on conic sections without an optical context."[5] In fact, as Professor Clagett has shown,[6] within the Latin tradition interest in the treatise derived from the epistemological arguments as stated by Maimonides; much the same, we will see, holds of the Hebrew tradition. Thus the principal subject of this paper is the transmission of *On Two Lines* in its relationship with Maimonides' *Guide.*

In what follows, I will proceed in three steps. I. I will show that the epistemological argument adduced by Maimonides had already been used by Geminus in the first century B.C. and was known to mathematicians writing in Arabic in the 10th and 11th centuries. II. I will next turn to the Latin tradition of the treatise. First I will supply some information concerning the translator and his circle at Frederick II's court and then will address the question, why the treatise was rendered into Latin at all. The reason for this, I will suggest, is that Maimonides' *Guide of the Perplexed* was translated into Latin at Frederick's court in the 1230's and that *De duabus lineis* become relevant as a result. Further, I will discuss the social, political and intellectual conditions to which, I believe, the Latin translation of the *Guide* and, with it, the *De duabus lineis* owe their existence: these two translations were part and parcel of an intense translation enterprise from Arabic into Latin, including notably Averroes' commentaries, an enterprise promoted by the emperor as a means in the fierce struggle between him and the papacy. III. Lastly, I will report the existence of a

Hebrew version of *On Two Lines*, which gave rise to a number of mathematical treatises bearing on the notion of asymptotes. This Hebrew tradition, which, like the Latin one, is clearly associated with Maimonides' *Guide*, throws clarifying light on the transmission of *On Two Lines* within the Latin tradition too.

I. GREEK INTO ARABIC: IMAGINATION, REASON AND ASYMPTOTES FROM GEMINUS TO MAIMONIDES

It has not yet been noticed, as far as I am aware, that Maimonides' argument on the possible discrepancy between reason and imagination, far from being original with him, had already been formulated by Geminus no less than twelve centuries earlier.

Two relevant passages from his lost work on mathematics are preserved in Proclus' *Commentary on the First Book of Euclid's Elements*. Arguing that Euclid's parallel postulate "ought to be struck from the postulates altogether," Proclus refers to some who "might mistakenly think that this proposition deserves to be ranked among the postulates on the ground that the angles' being less than two right angles makes us at once believe in the convergence and intersection of the straight lines." "To them," he says,

> Geminus has given the proper answer when he said that we have learned from the very founders of this science not to pay attention to plausible imaginings in determining what propositions are to be accepted in geometry. Aristotle likewise says that to accept probable reasoning from a geometer is like demanding proofs from a rhetorician. And Simmias is made by Plato to say, 'I am aware that those who make proofs out of probabilities are imposters.' So here, although the statement that the straight lines converge when the right angles are diminished is true and necessary, yet the conclusion that because they converge more as they are extended farther they will meet at some time is plausible, but not necessary, in the absence of an argument proving that this is true of straight lines. That there are lines that approach each other indefinitely but never meet seems implausible and paradoxical, yet it is nevertheless true and has been ascertained for other species of lines. May not this, then, be possible for straight lines as for those other lines? Until we have firmly demonstrated that they meet, what is said about other lines strips our imagination of its plausibility. And although the arguments against the intersection of these lines may contain much that surprises us, should we not all the more refuse to admit into our tradition this unreasoned appeal to probability?[7]

We learn more of Geminus' notions of lines that "approach each other indefinitely but never meet" in another context: in order to show that "absence of intersection does not always make lines parallel," Proclus reports Geminus' classification of lines. Among the asymptotic lines that lie in one plane, are those which "are always equidistant from one another," and others which are

constantly diminishing the distance between themselves and their straight lines, like the hyperbola and the conchoid. Although the distance between these lines constantly decreases, they remain asymptotes and, though converging upon one another, never converge completely. This is one of the most paradoxical theorems in geometry, proving as it does that some lines exhibit a non-convergent convergence.[8]

Clearly then, by Geminus' time Apollonius' conic sections and their asymptotes had already been invoked to establish the epistemological notion that imagination and mathematical demonstration are two distinct things which must be kept apart. Maimonides is but a distant link in a very long chain of transmission of this argument.

The detailed history of this argument throughout the centuries separating Geminus from Maimonides will not be attempted here. Let us only note that the epistemological argument may be related to the composition of *On Two Lines*. In fact, Geminus' mathematical treatise may well have been available in Arabic.[9] In any event, the argument concerning the impossibility of imagining the asymptotes whose existence is yet proven to reason seems to have been known to mathematicians writing in Arabic during the two centuries before Maimonides and in all likelihood it contributed to their interest in the subject of asymptotes. Thus, as already noted by Clagett, Abû Sa'îd Aḥmad ibn Muḥammad ibn 'Abd al-Jalîl al-Sijzî, a renowned astronomer, astrologer, and mathematician of the second half of the tenth century, wrote a "Treatise on how to imagine the two lines which approach one another but do not meet" whose incipit reads: "I have pondered the matter of the two lines, one of which is a straight line and the other the perimeter of a hyperbolic section [and concerning which it is affirmed] that they always approach each other on being extended indefinitely and that yet it is impossible that one meets the other."[10] Similarly, a younger contemporary of al-Sijzî, Muḥammad b. Aḥmad b. Muḥammad al Qummî, wrote a "Treatise on the possibility of the existence of the two lines which always approach one another but do not meet."[11] The fact that al-Sijzî explicitly refers to the problem of imagining the asymptotes suggests that he, at least, was aware of, and interested in, the epistemological consequences that can be drawn from the mathematical treatment of asymptotes.[12]

Other mathematicians, it seems, were drawn to the subject of asymptotes for purely mathematical reasons. Thus the great Abû 'Ali al-Ḥasan b. al-Ḥasan Ibn al-Haitham (945-c, 1040) wrote a tract with the title: "A treatise refuting the proof to the effect that the hyperbola and the two lines which do not meet it [i.e. its asymptotes] continually approach [each other] but do not meet"[13] – his concern, this title seems to me to suggest, was the validity of a proof rather than epistemological matters. This suggestion is confirmed by a quotation from an unnamed Arab mathematician, embedded in one of the first Hebrew commentaries on Maimonides' *Guide*, written in 1280 by R. Shem Tov b. Joseph Falaqera (c. 1225–1295). In the course of his commentary on Maimonides' asymptotes argument, Falaqera draws on (and quotes from) the Arab text of *On Two Lines* (cf. below, p. 46) and then goes on to say:

> I found that one of the geometers has written on this. He said: 'concerning the four theorems he [i.e. the author of *On Two Lines*] has adduced, they are beyond any doubt. However, what he affirmed [in the fifth], even committing his soul to it, concerning the possibility to construct on the surface of a cone two lines, a straight one and a curved one which, in its beginning, has some distance to the straight line facing it, but the further they are both protracted on the surface of the cone, the more it approaches the straight line facing it, without yet ever meeting it even if they are protracted together indefinitely on the surface of the cone – this is nonsense and has no truth to it.' [...] The writer went into great lengths concerning this matter, but I did not see fit to quote the rest of his words, for I would have had to write down the theorems [and/or figures] too. Concerning this matter, it is fit to rely on what our Master [Maimonides] of blessed memory has written, for he was very knowledgeable in geometry, and if there were any error in it, he would not have written it.[14]

Falaqera here explicitly says that he is quoting a (presumably) Arabic treatise (Ibn al-Haitham's?) which addressed itself to, and took to task *On Two Lines*. This mathematical controversy, let us note in passing, was obviously beyond Falaqera's reach, for he preferred to leave aside the arguments, entrusting himself to Maimonides' competent judgment.

Our cursory glance[15] at the Arabic tradition has shown that during the second half of the 10th century and the first half of the 11th, there was some interest among Arabic-writing mathematicians in the asymptotes of a hyperbola: some of them, it seems, had mathematical concerns only, while others were interested in the epistemological implications too. This is presumably the context which gave rise to *On Two Lines*.

II. THE LATIN TRANSLATION: THE *GUIDE* AND THE EMPEROR AGAINST THE POPE

The Latin translation of *On Two Lines*, the colophon of the manuscript tells us, was made from the Arabic and is due to John of Palermo. Whatever little we know about him, has already been discovered by Michele Amari, the historian of Muslim Sicily, more than a hundred years ago:[16] like Michael Scot between 1220 and his death (c. 1236) and Master Theodore thereafter, Master John of Palermo bore the official title of "court philosopher" to Frederick II. Two references to the notary John of Palermo, dating from 1221 and 1240, are generally believed to refer to our Master John,[17] for Frederick's courtiers usually held official positions as notaries, judges or falconers, so that, as C.H. Haskins wrote, "we are not surprised to find Frederick's astrolger, Theodore, engaged in the same year in casting horoscopes, going on missions, making confectionary, drafting letters, and translating an Arabic work on falconry."[18] In 1225 Master John is mentioned by Leonard of Pisa as having accompanied him to the emperor's presence where he proposed to him mathematical questions.[19] Thus, the only information we possess of John concerns his

knowledge of Arabic, his mathematics, and his official position at Frederick's court between c. 1220 and c. 1240.

This scanty knowledge of John himself is happily supplemented by what we know of the intellectual context within which he worked at Frederick's court.[20] Frederick II, as is well-known, combined an insatiable intellectual curiosity with a particular acquaintance with, and interest in Arabic culture. He knew Arabic from his youth, and further strengthened his links with the Arab world during the crusade which brought him to Jerusalem (1228–9). Throughout his life he remained in contact with Arab rulers, particularly the Sultan of Egypt and the ruler of Tunis, who occasionally sent him precious gifts of scientific interest such as animals unknown in the West or (in 1231) a sophisticated *planetarium*. On several occasions Frederick composed a questionnaire on scientific or philosophical matters which he sent to Arab rulers who had it answered by prominent scholars. The best-known of these are the so-called "Sicilian questions" answered by Ibn Sab'in (sometime between 1237 and 1242).[21] The emperor had very wide-ranging interests, including philosophy and its theoretical implications, zoology (particularly falconry, the subject of Frederick's own book), mathematics, optics and astronomy. Concerning the latter disciplines – which are particularly relevant here – let us note that optics and mathematics were the subject of some of Frederick's questionnaires, that he was particularly interested in the problem of optical illusions, that on at least one occasion a particularly competent mathematician–astronomer was sent to Frederick by the Sultan of Egypt, and that he took pains to meet great mathematicians personally, and most famous of whom was Leonard of Pisa (1226).[22]

With Leonard we come to the active side of Frederick's interest in science and philosophy. Far from being a mere "consumer" of knowledge, Frederick patronized scholars, facilitating the pursuit of their work. Leonardo Fibonacci may have been one of them, for he dedicated many of his works either to Frederick himself or to Michael Scot, Frederick's court astrologer and philosopher. Scot was indeed the central intellectual figure at Frederick's court. As is well known, the introduction of Averroes' writings into the West, particularly into the University of Paris, took place in the wake of their translation by Michael Scot. According to R.A. Gauthier's recent findings, Scot entered Frederick's service already in 1220 and thus it is under Frederick's patronage that he produced his most important works: the abbreviation of Avicenna's *De animalibus* and the translations of Averroes' commentaries on *Metaphysics*, *De caelo*, *De anima* and *Physics*, probably also those on *De generatione et corruptione*, *Meteorologica IV* and *Parva naturalia*, as well as of Averroes' own *De substantia orbis* from Arabic into Latin, making Sicily a highly important center of translation, second, if at all, only to Toledo.[23] Indeed, as R. de Vaux wittily wrote, although the story according to which Averroes' sons stayed at Frederick's court is certainly a legend, Averroes' writings were definitely there.[24] Nor was Scot a lone translator at the court: Master Theodore of Antioch, probably Scot's successor as court astrologer–philosopher, translated a work on falconry from Arabic. According to Roger

Bacon's unfavorable comment, Scot's knowledge of Arabic was insufficient, so that for his translations he was dependent on help from scholars more knowledgeable in Arabic. Such scholars were usually Jews (possibly also converted Jews) and it is therefore not surprising to find Frederick patronizing also Jakob b. Abba Mari Anaṭoli, a Jewish philosopher–translator who was employed by Frederick as a physician at Naples and of whom we know that he collaborated with Scot and that he translated several works of Averroes from Arabic into Hebrew.[25] Emperor Frederick II, in short, made his court into an outstanding intellectual center in which learning was intensely pursued, with much of the activity directed toward translating philosophical and scientific literature from Arabic into Latin and Hebrew. This is also the context in which Master John of Palermo produced the Latin versions of *De duabus lineis*.

Yet, even if we are now aware that John was not working in a void and that, quite to the contrary, his translation was an integral part of a large organized enterprise promoted by the emperor, a puzzle remains: Why *On Two Lines*? After all, in the 1220s or 1230s the translation of philosophical and scientific works had not gone very far; the translation of Averroes' works was just beginning to get under way. Why, then, of all things, translate *On Two Lines*, a probably anonymous, short treatise which stands quite apart from mainstream mathematics? What indeed could one do with *De duabus lineis*?

The answer I suggest to this question is that *De duabus lineis* came in the wake of the translation into Latin of Maimonides' *Guide of the Perplexed* at Frederick's court: the Latin version of our treatise owes its existence to the fact that it bears upon an interesting passage of the *Guide*, one which was particularly intriguing to a ruler with a bent for mathematics. Looking at the matter in some detail will prove rewarding, I believe, because it sheds light on the social and political context and on the motives underlying the translation into Latin of the *Guide* and, therefore, of *On Two Lines* too.

It was Moritz Steinschneider, that incomparable historian of Hebrew, Arabic and Latin medieval literatures, who, in 1863–4, was the first to come up with the hypothesis that the medieval Latin translation of Maimonides' *Guide* was done at Frederick's court.[26] This suggestion was further elaborated by J. Perles in 1875.[27] The evidence adduced by these two scholars is essentially the following: 1. The emperor Frederick himself displayed an early acquaintaince with, and interest in, the *Guide*.[28] 2. Various Hebrew sources report on a meeting, or at least a correspondence, between Frederick and al-Ḥarizi, from whose Hebrew rendering of the *Guide* the translation into Latin was made. 3. Writing in Southern Italy as early as the 1240s, Moses ben Salomon of Salerno, a student of Jacob Anaṭoli and the very first commentator on the *Guide*, was already acquainted with the Latin translation which he quotes five times.[29] All this, Steinschneider and Perles argued, suggests that the *Guide* was translated into Latin at Frederick's instigation. Obviously, the fact that during the 1230s Frederick's court was the place at which Scot translated works of Averroes lends further credence to Steinschneider's and Perles' thesis.

More recently, however, W. Kluxen has challenged this view.[30] His principal argument is that the extant manuscripts of the medieval Latin translation of the

Guide point to southern France as the place at which the translation was undertaken. In addition, it is unlikely, he maintains, that the Latin translator, who worked from al-Ḥarizi's Hebrew version of the *Guide*, should do so at Frederick's court, where Jacob Anaṭoli, the son-in-law of Shemuel Ibn Tibbon, the other translator of the *Guide* into Hebrew, was present. Lastly, among the first quotations from the Latin version of the *Guide* are those that occur a little after 1240 in works written in Paris (Albertus Magnus, Alexander of Hales) and this, Kluxen argues, points more to the south of France than to Italy. Kluxen suggests that the fierce and spectacular dispute inside the Jewish community of southern France over the legitimacy of studying the *Guide*, a dispute in which the ecclesiastical authorities, in particular the Dominicans, intervened (cf. below), attracted the latter's attention to this work: following its public burning at Montpellier in 1233, they had the *Guide* translated so as to be able to get acquainted with it.

Kluxen's thesis must be rejected, however.[31] To begin with, the vicissitudes of survival of manuscripts can never provide conclusive evidence. The fact that at Frederick's court the Latin translation should be made from al-Ḥarizi's Hebrew version can fairly easily be accounted for if we accept the reports according to which the emperor was in personal contact, or even met, al-Ḥarizi. Further, simultaneously with Albertus Magnus, we find, as Kluxen himself notes, the Dominican inquisitor–philosopher Moneta of Cremona quoting from the Latin *Guide* in northern Italy, a region not in particularly close contact with southern France, but (as we will presently see) one in which Frederick wanted the literary productions of his court to make their impact.[32] In fact, the main weakness of Kluxen's view is that it completely disregards the social and political context of the time which makes it virtually impossible to think that the *Guide* was translated in southern France, but which, inversely, makes very plausible the thesis that it was translated at Frederick II's instigation, along with Averroes' writings.

The *Guide*, so much is clear, was translated during the mid or later 1230s.[33] Now 1229 is the year during which the crusade against the Albigensians ended with the latter's total defeat and with the capitulation in disgrace of their protector, Count Raymond VII of Toulouse. From then on, the uprooting of heresy was in the hands of the Inquisition, an office with which the Dominicans are formally entrusted in 1233. During the following fifteen years, repression was systematic, thorough and ruthless. Thus Roland of Cremona, the first Dominican holder of the chair of philosophy at the University of Paris and head of the Dominicans at Toulouse from 1230 to 1233 (when other Inquisitional charges called him to northern Italy), held that 'opus dei est impugnare heraticos et infideles." Roland in fact did not shy away from undertaking the necessary measures to accomplish this *opus*: when, for instance, it became known that a man who was buried as a Christian had in fact been a heretic, he had his body dug up, dragged through the town and burnt.[34] At that time the burning of heretics on the stake, virtually unknown until the end of the 12th century, became more and more widespread.

Repression by sword and fire was accompanied by measures to eradicate

heretical ideas from the minds: "pravos extirpat et doctor et ignis et ensis," wrote John of Garland who, all imbued with missionary zeal, came from Paris to Toulouse to be one of the first masters of the new University there.[35] In fact, the aim of the very foundation of the University of Toulouse in 1229 – it was imposed on Raymond VII among the conditions of his capitulation – was to combat heresy and establish orthodoxy.[36] The crucial importance Rome accorded to this move can be inferred from the fact that the masters and students who, during the *dispersio* of the University of Paris (1229–1231) agreed to prefer Toulouse to a well-established university or to returning home, were accorded plenary indulgence, equal to that granted to crusaders. Books being (then as now) the main agent responsible for the spread of, and the contamination by heresy, the possession of the Bible (the edifying Psalms excepted) in the vernacular, was prohibited.

All these developments had an immediate impact on the Jewish communities in southern France and, in particular, on the literary history of the *Guide of the Perplexed.* The Jews' fate and well-being were linked to those of the Albigensians. The Church suspected that Jews stimulated heresy and some heretical sects indeed accorded great importance to the Old Testament. Cities which were the most affected by the heresy, also had large Jewish populations. Rulers who favored Albigensians were usually friendly towards Jews, appointing both Albigensians and Jews to functions in the fiscal administration. No wonder, therefore, that after 1229 the heretical Albigensians and the Jewish unbelievers were usually the target for ecclesiastical repression.[37] This set of circumstances was used by a number of prominent "conservative" rabbis who sought to uproot what in their eyes was a widespread and dangerous heresy among their own correligionists: the study of philosophy, in particular of Maimonides' *Guide.*

The essential facts are well-known:[38] opposition to the *Guide* among traditionalists arose as soon as it was translated into Hebrew for the first time (1204), and disputes between Maimonidians and anti-Maimonidians must have been going on for a long time. Then, in 1232, things quickly moved toward a crisis: R. Salomon b. Abraham of Montpellier and two of his student-followers initiated a movement of opposition to the study of the *Guide* and of philosophy in general, a movement which resulted in a ban on that study. As H. Graetz perspicaciously observed,[39] the idea of banning the *Guide* was probably conceived in imitation of Pope Gregory IX's recent interdictions (1228, 1231) of the study of Aristotle's works.[40] The ban was pronounced, it seems, by the majority of the rabbis of traditionalist northern France. Then, however, some anti-Maimonidians were themselves the object of a counter-ban issued by a number of Maimonidian communities in southern France and in Aragon. Thereupon the rabbis of northern France withdrew their ban on the Maimonidians, leaving R. Abraham and his two students isolated. It is then, in about December 1233, that some anti-Maimonidians turned to the Dominican inquisitors and to the Cardinal (probably the pontifical legate Romano, cardinal of Sant'Angelo) for help, denouncing the *Guide* as containing heretical ideas. Under the then prevailing political conditions, the ecclesiastical autho-

rities did not wait to be asked twice: they had the accusers read and translate to them relevant, allegedly heretical passages, whereupon the *Guide* (or, at least, though less probably, parts of it) were publicly burnt at Montpellier (end of 1233).

In 1233, then, the *Guide* had not yet been translated into Latin for, as Kluxen pointed out, the incriminating passages had to be translated for the inquisitors.[41] It is very unlikely, I believe, that a Christian residing in southern France would choose to translate the *Guide* into Latin just after it had been condemned and burnt there by the ecclesiastical authorities; and it is almost absurd to believe, as Kluxen does, that the Dominicans themselves would translate a book they had just put on the stake as heretical. Yet it is plausible to surmise with Kluxen that there is *some* connection between the burning of the *Guide* and the appearance of a Latin translation of it a few years later. My suggestion is that the burning of the *Guide* by the papal authorities induced their archenemy, emperor Frederick II, to have it translated into Latin with "subversive" purposes in mind.

The story of the long continuous struggle which opposed Frederick II to the popes need not be retold here. Let us only note some of its consequences for intellectual history. Just as the University of Toulouse was founded to foster orthodoxy and the papal hold over Languedoc, so also Frederick had founded (in 1224) the University of Naples: he needed trained public servants, but preferred them to be educated at a university under his direct control rather than have them go to universities in northern Italy, in particular to that of Bologna which depended on the pope. Indeed, as R. de Vaux wrote, just as Frederick's saracen army faced the papal army, so also "the Naples professors would dress the Greek and Islamic science and philosophy against the theological wisdom."[42] In fact, in 1238 we find Master Theodore of Frederick's court, who accompanied the emperor to the siege of Brescia, engaging in a series of disputations with Dominicans: he won them all, but was finally defeated by the former professor of philosophy, then inquisitor in northern Italy, Roland of Cremona.[43] Above all, it is in this context of continuous philosophical and theological struggle between Frederick and the popes that the former prompted the translation of Averroes' works by Michael Scot: As R. de Vaux has persuasively argued, Frederick encouraged the translations not out of pure love for science alone, but also as an integral part of deliberate policy of destabilization (to use a trendy term) directed against the pope. In fact, in 1231 Frederick seems to have generously presented the University of Bologna – a Dominican stronghold – with Scot's new translations of commentaries on the prohibited Aristotelian writings, thereby pursuing his war against the pope (with whom he had just concluded another treaty) with other means; similarly, Scot himself took care to send his translations to influential scholars at the University of Paris.[44] Thus, translating Maimonides' *Guide* into Latin fits perfectly well into Frederick's policy. Indeed, as Graetz has pointed out, the *Guide*'s "biblically colored" philosophical style was more accessible to Christians than the Arab philosophical works and could, therefore, appear as more subversive.[45] In fact, the Latin *Guide* surfaces for the first time in northern Italy

and in Paris – precisely the same places to which Scot's translations of Averroes were directed.

To sum up: I have suggested that *On Two Lines* was translated into Latin in the wake of the *Guide*. This hypothesis, I believe, affords the only explanation as to why our tract was translated at all, for *On Two Lines* is hardly meaningful unless associated with the *Guide*. Moreover, independent evidence clearly points to Frederick II's court as the place at which the *Guide* was translated into Latin during the late 1230s, i.e. the very same place and time at which Master John of Palermo produced there the *De duabus lineis*. Therefore, the social and political context of the *Guide*'s Latin translation is also the one which occasioned that of *On Two Lines*. The *Guide* had been rendered into Latin at Frederick II's instigation after that work had been declared heretical and burnt by the ecclesiastical authorities in 1233; the Latin *De duabus lineis* is therefore an offshoot of the long and merciless struggle between the Hohenstaufen emperor and Rome.

III. THE HEBREW TRADITION

Written in Arabic about 1190, Maimonides' Guide of the Perplexed immediately became very widely diffused, both in Arabic and in Hebrew. In fact, a first Hebrew translation was completed by Shemuel ibn Tibbon before Maimonides' death in 1204; a second, less precise, but stylistically purer translation was prepared by the poet Yehuda al-Ḥarizi a few years later (1205–1213). Maimonides' enormous religious authority largely legitimated and promoted the study of the *Guide* against the anti-rationalist opposition. The *Guide* thus became the object of much intensive study throughout the Middle Ages and thereafter, and it has given rise to numerous long and short, specific and general commentaries on it.[46] Among the commentaries addressing themselves to specific passages of the *Guide* there are some which bear on Maimonides' asymptotes argument: they occasionally bear the title "Concerning the Statement of the Master on Two Lines Which Do Not Meet."[47] Many of these commentaries, dating from the fourteenth century onwards, derive from, and elaborate *On Two Lines*, which, in fact, has been available in an excellent Hebrew translation.

At present, no less than eight manuscripts containing a Hebrew version of *On Two Lines* are known to me. Seven of them – belonging to three distinct families – carry one and the same text; an eighth manuscript contains what apparently is a different recension of the same translation.[48] The Hebrew text corresponds in all details to the Latin one published by Clagett.[49] Most manuscripts also carry four figures conforming to those printed by Clagett.[50] Disappointingly, none of the Hebrew manuscripts indicates the author of the text, nor the translator, nor even the fact that the text is a translation.

That *On Two Lines* was translated into Hebrew because it elaborated on Maimonides' argument can hardly be doubted. But who is the translator? It is tempting to think of the translation as having been made at the same time and place as the Latin translation, i.e. at Frederick II's court during the 1230s.

Indeed, as has already been noted, Jewish scholars familiar with the *Guide* and interested in mathematics were present at the court at that time. The complete conformity of the Latin and the Hebrew text would seem to confirm this hypothesis.

Two considerations militate against this view, however. The first is this: the first Hebrew commentary on the *Guide* was written in the 1240s at Naples by Moses b. Salomon of Salerno who, as noted earlier, was a student of Jacob Anaṭoli, one of Frederick II's protégés. It is plausible to think that if *On Two Lines* had been translated into Hebrew at Frederick's court, Moses would already be acquainted with it and allude to it in his commentary, just as he mentions the *Guide*'s Latin translation. An examination of the relevant passages in Moses' commentary reveals, however, that the author merely paraphrases and abridges Maimonides' argument, even leaving unmentioned the fact that one line is a curve, the other a straight line:[51] to be sure, Moses b. Salomon of Salerno was unaware that Maimonides' argument can be the object of a lengthy mathematical commentary; in all probability he was unacquainted with *On Two Lines* in either Hebrew or Latin.

A second consideration confirms this conclusion and suggests that *On Two Lines* was not available in Hebrew before the beginning of the 14th century. Writing in 1280, R. Shem Tov b. Joseph Falaqera, also among the early commentators on the *Guide*, quotes the beginning of *On Two Lines*, but in a translation which is his own and which differs from the one found in our manuscripts.[52] In fact, Falaqera was knowledgeable in Arabic and in his various works he quotes abundantly, without ever naming his sources, from Arabic philosophical texts.[53] In the relevant passage he is commenting on Maimonides' asymptotes argument:

> As to the second notion invoked by him [Maimonides], namely the one concerning the drawing of two lines – it has been invoked by the geometers too. Here is what they say. They said: 'We wish to draw two lines such that in the beginning of their extension there is some distance between them, but the more they are protracted, this distance diminishes and the closer they approach each other, it being impossible, however, that they ever meet, even if they are extended indefinitely. One of these lines is straight and the other is a curve. The curved line is drawn on the cone described by Euclid in the beginning of the eleventh book [of the *Elements*]'. And it is known that this can be correctly imagined only by someone who attended to geometry and who knows the figure called cone as well as the four theorems demonstrating that the more the curve is protracted the more it approaches [the straight line].[54]

In this passage, the sentences in inverted commas are obviously a quotation from *On Two Lines*,[55] to which also the mention of the "four theorems" refers. It seems reasonable to conclude from it that by 1280 there still was no, or at least no widely diffused, Hebrew translation of the treatise and that Falaqera felt called upon to communicate to his readers ignorant of Arabic what "the

geometers" had to say on Maimonides' argument (and even, as noted above, to acquaint them with the existence of a controversy over it). Indeed, half a century later, Joseph Kaspi (1279–1340), yet another early commentator on the *Guide*, contents himself to quote from Falaqera the above passage (with some omissions): he too still seems to have been unacquainted with a Hebrew translation of the entire tract.[56]

Although Falaqera's and Kaspi's testimonies *a silentio*, which are confirmed by similar ones of some fourteenth-century philosophers, do not establish the claim conclusively, it would appear that *On Two Lines* was not translated into Hebrew before the beginning of the 14th century. In that case the conjecture may be suggested that the anonymous translator was Qalonymos b. Qalonymos of Arles, known to the Latins as Maestro Calo, whose productive period covers the first two decades of the 14th century. Indeed, among the medieval Hebrew translators of mathematics, Qalonymos is the one who was most interested in works not belonging to the Euclidean tradition: he translated the anonymous treatise *On Five Bodies*, and Archimedes' *On the Sphere and the Cylinder* and *On the Measurement of the Circle*.[57] This surmise would lead us to date the Hebrew translation of *On Two Lines* to the first quarter of the 14th century. Let me note, however, that although the Hebrew version may postdate the Latin one by almost a century, its syntax and vocabulary make it clear that, as practically all scientific translations of that period, it was done directly from the Arabic and not from the Latin.

Indeed, toward the end of the fourteenth century we find definite evidence of the impact of *On Two Lines* within the Hebrew tradition. It comes from Profiat Duran, also known as Efodi (d.c. 1414), one of the *Guide*'s best known commentators and the author of works in astronomy, philosophy, and religious polemics.[58] Efodi's commentary on the *Guide* contains what Clagett has described as "confused comments" on the asymptotes argument,[59] and in these no traces of our treatise are discernible. However, Efodi also wrote an extended mathematical commentary on *On Two Lines*, extant in two Paris manuscripts,[60] which elaborates and explains its demonstrations. Probably written in the last one or two decades of the fourteenth century, this commentary plainly proves that by that time the Hebrew version of *On Two Lines* has become the object of intensive study.

The tradition issuing from the Hebrew version of *On Two Lines* thrived for more than two centuries. Steinschneider gives a probably inexhaustive list of tracts devoted to the problem of asymptotic lines.[61] Of the greatest historical significance among these tracts is the one by Moses b. Abraham Provençal (1503–1575), published in Hebrew in 1549 and in Italian translation in 1550. Now Provençal already belonged to the generation of Italian Renaissance Jewish scholars who could draw on sources of languages other than Hebrew (Latin and/or Italian), and he indeed mentions Apollonius of Perga's name (in its Italian form), although there never was a Hebrew version of the *Conic Sections*. Nonetheless, Provençal's tract issued straight from the Hebrew tradition of *On Two Lines*: its wording is identical with that of the other Hebrew treatments of the problem, and he even explicitly says that his aim is only "to

expand the explanation concerning this problem which I have found in a very short [obviously Hebrew] commentary, from which I have understood the truth of the matter; for I have not invented it myself."[62]

Through the Italian translation of Provençal's tract, the Hebrew tradition of the study of *On Two Lines* flowed into the Latin one. Clagett has in fact pointed out that Cardano drew on Provençal in his 1554 enlarged treatment of the problem,[63] a work which in turn influenced Jacques Peletier's poor treatment of it.[64] This medieval and Renaissance tradition culminates in Francesco Barozzi's *Admirandum illud geometricum problema tredecim modis demonstratum: Quod docet duas lineas in eodem plano designare, quae nunquam invicem coincidant, etiam si in infinitum protrahantur: et quanto longuis producuntur, tanto sibiinvicem propriores evadunt* of 1586, which contains *inter alia* a lengthy "complete reworking" of Provençal's treatment of the problem.[65] Now six of the thirteen proofs adduced by Barozzi, namely the first, second, tenth, eleventh, twelfth, and thirteenth, derive from *On Two Lines*, and of these, all except the first have their origin in the Hebrew tradition, notably in Provençal or in those depending on him (Cardano, Peletier).[66] Only Barozzi's first proof comes from Johann Werner, the author of the *Libellus super vigintiduobus elementis conicis* (Nuremberg, 1522), who apparently knew *On Two Lines* in one of its Latin versions.[67] This means that the impact of *On Two Lines* on the Latin tradition derives almost completely from the Hebrew version of this tract. We thus arrive at the somewhat unexpected and paradoxical conclusion that the two Latin versions of *De duabus lineis* unearthed by Clagett had almost no influence on the subsequent inquiry into the asymptotes problem. By contrast, the Hebrew *On Two Lines* was the fountainhead of a fairly lively research tradition among the scholars writing in Hebrew, a tradition which ultimately influenced the Latin one too, mainly *via* Moses b. Abraham Provençal's treatise. In short, the impact of *On Two Lines* in the West is due principally to its Hebrew version.

The Hebrew writings on the asymptotes problem, let us finally note, continued to arouse interest even in the seventeenth century. Thus Joseph Salomon Delmedigo (1591–1655), replying to a query on that matter from the Karaite Ẕeraḥ b. Natan writes:

> Concerning the matter of the inclined (*noṭim*) lines of which the Master [i.e. Maimonides] has written: many have written about it, and one of the great men of my country has gathered [what has been written] in a special book which contains thirteen modes [of proof]. I myself have seen additional ones in manuscripts in the sacred tongue.[68]

Half a century later, a traditional Rabbi, Yair Ḥayyim b. Moses Samson Bachrach (1638–1702) still mentions in one of his Responsa a Hebrew treatise of two folios on those curious lines which come ever closer to one another but never meet.[69]

IV. CONCLUSION

This paper was concerned with the literary history of *On Two Lines*. I have suggested that this anonymous Arabic treatise, presumably dating from the second half of the 10th or the first half of the 11th century, was written in the context of an ongoing debate among mathematicians over the properties of asymptotes. This debate was probably nourished by the idea, which goes back to Geminus, that the notion of asymptote fosters the epistemological argument to the effect that there are things which can be demonstrated to reason although they cannot be imagined. Maimonides, through whom this argument came into prominence, undoubtedly was acquainted with *On Two Lines*.

In the West, I have further suggested, the history of the treatise was linked to that of Maimonides' *Guide of the Perplexed*. John of Palermo produced the Latin *De duabus lineis* at emperor Frederick II's court, in all probability as a sort of appendage to the Latin translation of the *Guide*. Therefore, the social history of the Latin *Guide* is also that of *De duabus lineis*, which thus owes its existence to the concurrence of the following factors: (1) disputes between Maimonidians and anti-Maimonidians inside the Jewish communities of southern France attracted the attention of the ecclesiastical authorities to the *Guide*; (2) the *Guide* was judged heretical and burnt (1233), an action which was an integral part of the vast and thorough repression of all dissident and heretical movements in southern France, following the end of the Albigensian crusade (1229); (3) since the 1220s, Frederick II directed against the pope a policy of "ideological subversion," consisting mainly in having Averroes' commentaries latinized and diffused; (4) therefore, a translation into Latin of the *Guide* appeared to the emperor as only too congenial. All these contingencies provided the context in which a Latin version of *On Two Lines* was prepared.

Lastly, *On Two Lines* was translated into Hebrew, apparently only in the beginning of the 14th century, because it elaborated on the asymptotes argument adduced in Maimonides' *Guide*, the main philosophical work in Hebrew. The Hebrew version of *On Two Lines* gave rise to a number of mathematical treatises on asymptotes but, it should be noted, apparently has not drawn the attention of philosophers: in slightly varying forms and for different purposes, the epistemological argument is adduced by Isaac b. Abraham Ibn Laṭif (c. 1210–1280),[70] Levi ben Gershom (Gersonides, 1288–1344),[71] Ḥasdai Crescas (1340–1410)[72] and presumably many more,[73] all of whom simply quote or abridge Maimonides' formulation of it, with no reference to *On Two Lines*. To make the philosophical point, it would seem, Maimonides' statement of the argument was sufficient and one could tranquilly follow Falaqera's advice to put his trust in Maimonides' competent judgment.

As it happens, it was mainly the Hebrew version of *On Two Lines* rather than the Latin *De duabus lineis* itself, which influenced the Latin tradition to which that treatise gave rise in the second half of the sixteenth century. This tradition included Cardano, Peletier and Barozzi, one of whom may have been Newton's source for the epistemological argument.

Maimonides and, seven hundred years later, Newton, used the asymptotes argument in order to demonstrate the power of reason. But the argument can also be enlisted on the other side in this battle of ideas and some hundred years before Newton, the sceptic Michel de Montaigne drew from it quite opposite conclusions. In the second book of the *Essais* (published 1580) he wrote:

> Or ce sont des choses qui se choquent souvent; et m'a l'on dit qu'en la Geometrie (qui pense avoir gaigné le haut point de certitude parmy les sciences) il se trouve des demonstrations inevitables, subvertissans la verité de l'experience: comme Jaques Peletier me disoit chez moy qu'il avoit trouvé deux lignes s'acheminans l'une vers l'autre pour se joindre qu'il verifioit toutefois ne pouvoir jamais, jusques à l'infinité, arriver à se toucher.[74]

APPENDIX: THE HEBREW MANUSCRIPTS OF *ON TWO LINES*

The Hebrew text of *On Two Lines* is found in the following manuscripts. (In brackets I indicate, in compliance with the regulation of the Institute of Microfilmed Manuscripts in the Jewish National and University Library, Jerusalem, the number of the microfilm at the Institute.)

1. Paris, Bibl. nat., héb. 1021 (15716), ff. 67^{r}–68^{v}.
2. Paris, Bibl. nat., héb. 1026 (15025), ff. 41^{r}–44^{r}.
3. Florence, Bibl. Naz. Centrale Ms. 25(III 137) (11976), unpaginated, inserted after Euclid's *Elements*.
4. Oxford, Bodl. Mich. 835 (catalogue number 2006) (19291), ff. 12^{v}–14^{r}.
5. Vienna, Österr. Nationalbibliothek, Hebr. 194 (1456), ff. 87^{r}–89^{r}.
6. Naples, Bibl. Naz. Emanuelle III, Ms. III F 12 (11526), f. 185^{r}–185^{v}; the end is on f. 173^{r} (wrongly numbered 143).
7. Madrid, Bibl. Nacional Ms 5474 (7233), unpaginated, inserted after Euclid's *Optics* (*Ḥilluf ha-Mabbaṭim*) and *De speculis* (*Sefer ha-Mar'im*; cf. Steinschneider, *Hebräische Übersetzungen*, pp. 512–3).
8. Vienna, Österr. Nationalbibliothek, Hebr. 46 (1323), ff. 203^{r}–205^{v}.

Nos. 3, 6 and 7 of the above-mentioned manuscripts have been identified by Dr Y. Tzvi Langermann to whom I am very grateful for having made available to me and allowed me to use these unpublished findings.

These eight manuscripts fall into the following distinct families:

I. Nos. 1 and 2 clearly belong to a class apart: the text they both share varies, slightly but systematically, from that of the other manuscripts. Moreover, in both manuscripts, *On Two Lines* is accompanied by a commentary due to Efodi (cf. above, p. 47): in héb. 1021 Efodi's commentary is on the margin of *On Two Lines*, and in héb. 1026 it follows it (ff. 44^{r}–49^{v}). Héb. 1021, let me add, is inferior, having three lacunae of a few lines in addition to a number of less significant errors.

II. Nos. 3, 4, and 5 also form a class apart. They share the same typical text variations and, in addition, in all three, *On Two Lines* is embedded in a fixed sequence of the following distinct pieces:

(a) A number of questions to, and (fairly pedestrian) answers by an unidentified "divine" scholar. These questions concern the possibility to apprehend the notions of number and of the point by the senses; Euclid's parallel postulate; the construction of an isosceles triangle whose base angles are twice the angle at the apex. (Ff. 10^{r}–11^{v} in no. 4, ff. 83^{r}–85^{r} in no. 5.)

(b) Next comes a short text beginning with the sentence: "The following are the theorems from Euclid necessary for understanding and verifying the matter that comes next." Then follow, without proof, propositions II.5, II.6 and VI.8 from the *Elements*. (F. 11^{v} in no. 4, f. 85^{v} in no. 5.)

(c) There follows a text beginning with almost the same words as *On Two Lines*. This, however, is a distinct treatise on the same subject, namely the one attributed to Simeon Moṭoṭ (cf. below); this occupies ff. 11^{v}–12^{v} in no. 4 and ff. 85^{v}–87^{v} in no. 5.

(d) Then, on the same line, without any indication for the beginning of a next text, follows *On Two Lines*.

Given the similarity of the subject-matter of the tract attributed to Moṭoṭ with that of *On Two Lines*; the fact that both tracts begin and end almost identically; and finally the fact that in all three manuscripts – which obviously derive from a common ancestor – the two treatises are not set apart, it is understandable that the authors of the respective catalogues have usually failed to distinguish between the two treatises; in fact, only Schwarz's catalogue of the Vienna Nationalbibliothek (p. 223, no. 193.7) makes the appropriate distinction.

The first of the above-mentioned two treatises has been published in French translation by G. Sacerdote ("Le livre d'Algebre et le problème des asymptotes de Simeon Moṭoṭ", in: *Revue des études juives*, 28 (1894), 228–46, on pp. 228–35; 29 (1894), 111–26, on pp. 119–26; cf. Clagett, *Archimedes*, 4, p. 338 ff., particularly note 46). Sacerdote was unaware of the above three manuscripts (because in them the treatise is anonymous) and translated the text from the Munich manuscript 36, ff. 262^{r}–263^{v} in which it is in fact ascribed to Simeon Moṭoṭ, an author otherwise known only from a brief treatise he wrote on algebra in the middle of the fifteenth century. The fact that the Munich manuscript is the only one to ascribe the treatise to Moṭoṭ, makes it very doubtful whether the ascription to Moṭoṭ can be upheld.

III. The text of manuscripts nos. 6 and 7 is close to that shared by nos. 3, 4 and 5. It appears, however, separately, with neither the treatise ascribed to Moṭoṭ, nor any of the above-mentioned elements appended to it. These two manuscripts are the only ones which explicitly relate *On Two Lines* to Maimonides' *Guide*. No. 6 bears the title: "A commentary (or: explanation) on a statement adduced by the Master in his venerable book"; no. 7 has no title, but adds at the end: "This matter was adduced by the Master in his book, Part I, chapter 73."

IV. The eighth manuscript, lastly, carries a text quite distinct from the one shared by the other seven manuscripts, differing from it in both locutions and some technical terms. Thus, most cospicuously, it has *ḥarut (sic)* for a cone, whereas the text of the other manuscripts uniformly has *meḥudad* or *meḥudad 'agol*. Strangely, though, this text too has one occurrence of *meḥudad 'agol*. This feature, but above all the fact that, the differences notwithstanding, this text shares many locutions and technical terms with the "standard" text, seems to suggest that we have here a different, presumably earlier, recension of a single Hebrew translation.

This manuscript, let us note in passing, is the old Vienna Ms. 75 of which Steinschneider had already noted that its beginning and end are similar to the tract attributed to Moṭoṭ and suspected that the two were related (cf. his *Mathematik bei den Juden*, 219 f.). Schwarz's catalogue (p. 160, no. 150.3), less prudently, affirms it to be identical with the treatise attributed to Moṭoṭ.

POSTSCRIPTUM (1999)

This paper was first published in *Vivarium* 26 (1988), 113–40 and is reprinted here essentially unaltered. Without in any way attempting to review relevant literature published after 1988, I wish to draw the reader's attention to some particularly important publications by M. Roshdi Rashed bearing on the subjects discussed in this paper and already alluded to in the notes. His article referred to in n. 10 is now reprinted in his *Optique et mathématique. Recherches sur l'histoire de la pensée scientifique en arabe* (Aldershot, 1992). The text by Ibn al-Haytham (n. 13) will presumably be included in vol. 3 of Rashed's *Mathématiques infinitésimales*. Lastly, R. Rashed published a text on asymp-

totes by Sharaf al-Dîn al-Tûsî in the latter's *Oeuvres mathématiques. Algèbre et géométrie au XIIe siècle*, ed. by Roshdi Rashed (Paris: Les Belles Lettres, 1986), II, 129–135.

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NOTES

Acknowledgements: I owe my acquaintance with the *Tractatus de duabus lineis* (cf. below) to Dr Tony Lévy (CNRS): had he not mentioned to me the existence of a Latin tract by this name, this paper would not have been written. For helpful discussions I am grateful to Professor B.R. Goldstein (University of Pittsburgh), to Dr Lévy and to Professor Y.T. Langermann (Bar Ilan University). Research on Hebrew manuscripts not in Paris was done at the Institute of Microfilmed Hebrew Manuscripts in the Jewish National and University Library, Jerusalem, to whose assistance I am much indebted.

[1] J.E McGuire, "Newton on Place, Time, and God: An Unpublished Source," in: *British Journal for the History of Science*, 11 (1978), 114–29, at p. 119 (McGuire's translation). I am indebted to B.R. Goldstein and to J.E. McGuire for guiding me to this text.

[2] Maimonides, *Guide of the Perplexed* I, 73; quoted after the translation by Shlomo Pines (Chicago, 1963), I. 210.

[3] That Maimonides was well acquainted with the *Conic Sections* is evident from the allusion to it in the above-quoted passage. Therefore, the fact that Maimonides chose not to use the Apollonian formulation of the relevant theorem (2.14: "The asymptotes and the section, if produced to infinity, approach nearer one another and come within a distance less than any given distance," quoted after T.L. Heath, *Apollonius of Perga, Treatise on the Conic Sections* (Cambridge 1896), p. clxiv), is probably to be explained as due to his wish to avoid such a technical formulation in a philosophical work.

Y. Tzvi Langermann ("The Mathematical Writings of Maimonides," in: *The Jewish Quarterly Review*, 75 (1984), 57–65) has recently attempted to confirm F. Sezgin's statement (*Geschichte des arabischen Schrifttums*, V, Leiden 1974, p. 141) that Maimonides is the author of a commentary on Apollonius' *Conic Sections*, preserved in an Arab manuscript ascribing it to "al-ra'is Ibn 'Imrân Musâ bin 'Ubayd Allâh al-'Isra'îlî al-Qurṭubî." Langermann's argument in favor of this ascription is mainly that Maimonides was indeed knowledgeable enough in mathematics to be capable of writing such a commentary. (We may add here the following further indication: in an analysis of the notion of "commentary," Maimonides quotes al-Nairîzî's commentary on Euclid's *Elements* as an example of a work that is not, in truth, a "commentary" (cf. Maimonides, *Commentary on the Aphorisms of Hippocrates*, Hebrew translation by R. Moshe ibn Tibbon, ed. by Suessmann Munter, Jerusalem 1961, p. 3); Maimonides' brief remark makes it perfectly clear that he knew and understood al-Nairîzî very well.) There are, however, reasons for strongly doubting this ascription. Langermann (*op. cit.*, p. 58) argues that the "identification of Maimonides as the author of our text is made certain" by the fact that Maimonides' name, in the Arabic form noted above, appears both at the beginning and in the colophon of the text. Yet, against this argument one may bring up the fact that a Princeton Arabic manuscript (Garrett MS 1070), containing excerpts from Aristotle's so-called *Book of Animals*, also gives as the name of the author an Arabic form of Maimonides name (namely: Mûsâ b. 'Ubaid Allâh al-Qurtubî al-'Isra'îlî), but the text is quite certainly *not* by Maimonides. (This has been argued, very convincingly as it seems to me, by the editor of the treatise: cf. J.N. Mattock (ed. and trans.), *Maqâla Tashtamil 'alâ Fuṣûl min Kitâb al-Ḥayawân li-Arisṭû*, Cambridge, 1966, pp. x–xii; I am grateful to Dr Langermann for having brought this book to my attention.) Moreover, as Langermann himself has noted, no medieval source, Jewish or Moslem, lists a treatise on the *Conics* (nor, for that matter, one containing excerpts of *The Book of Animals*) among Maimonides' writings. Therefore, until further research, notably on the treatise itself, comes up with new and convincing arguments confirming the ascription to Maimonides, that ascription must, I believe, be regarded as very doubtful.

[4] Marshall Clagett, "A Medieval Latin Translation of a Short Arabic Tract on the Hyperbola," in: *Osiris*, 11 (1954), 359–85, *idem, Archimedes in the Middle Ages*, Vol. Four: *A Supplement on the Medieval Latin Traditions of Conic Sections (1150–1566)*, Philadelphia 1980, pp. 33–61, 335–57.

[5] *Ibid.*, p. 34.

[6] *Ibid.*, p. 335 ff.

[7] Proclus, *In Primum Euclidis elementorum librum commentarii* ed. G. Friedlein, Leipzig 1873, 192; quoted after Proclus, *A Commentary on the First Book of Euclid's Elements*, Translated with Introduction and Notes by Glenn R. Morrow, Princeton 1970, 150–51. The references are identified by Morrow as Aristotle, *Nicomachean Ethics*, 1.2, 1094 b 26 f. and Plato, *Phaedo* 92 d.

[8] Proclus, *In primum*, 177; quoted after *A Commentary*, 139. On Geminus' classification of lines, cf. Sir Thomas L. Heath, *Euclid, The Elements*, New York 1956, I, 160–161.

[9] F. Sezgin, *Geschichte des arabischen Schrifttums*, V, pp. 157–58.

[10] Clagett, *Archimedes*, 4, 34. Cf. Yvonne Dold-Samplonius, "Al-Sijzī", *Dictionary of Scientific Biography*, vol. 12, New York 1976, 431–2, where his dates are given as c. 945–c. 1020. On al-Sijzī's works cf. Fuat Sezgin, *Geschichte*, V, 329–34; VI, 224–6; and VII, 177–82. The incipit is that of the Leiden manuscript Bibl. der Rijksuniversiteit, Cod. Or 14(6), ff. 226–31. I have translated it as given in P. de Jong and M.J. de Goeje, *Catalogus Codicum Orientalium bibliothecae academiae Lugduno batavae*, III, Leiden 1865, 56. The relevant manuscripts have been examined by G.J. Toomer who found that what were held to be three different treatises are in fact but a single one; cf. his *Diocles, On Burning Mirrors*, Berlin etc. 1976, 30. On the variegated meanings of the notion of imagination (*tasawwur*, translating *phantasia*) here invoked, cf. H.A. Wolfson, "The Internal Senses in Latin, Arabic, and Hebrew Philosophical Texts," in: *Harvard Theological Review*, 28 (1935), 69–133; reprinted in *idem, Studies in the History of Philosophy and Religion*, vol. 1, edited by I. Twersky and G.H. Williams, Cambridge, Mass. 1973, pp. 250–314. [Added in proof: Al-Sijzī's treatise has now been edited, translated and interpreted in: R. Rashed, "Al-Sijzī et Maïmonide: Commentaire mathématique et philosophique de la proposition II–14 des *Coniques* d'Apollonius," in: *Archives internationales d'histoire des sciences*, 37 (1987), 263–96.]

[11] Sezgin, *Geschichte*, V, 336.

[12] This idea was elaborated by M. Roshdi Rashed in a lecture given on 21 March 1986 at a meeting of the group "Histoire des sciences et de la philosophie arabes" of the C.N.R.S. in Paris (Cf. also note 15 below.) [Added in proof: This lecture has now been published in the article indicated in note 10.]

[13] Sezgin, *Geschichte*, V, 373,

[14] Falaqera, *Moreh ha-Moreh*, ed. by M.L. Bisliches, Pressburg 1837, 61.

[15] With which we can content ourselves all the easier since, as I understand, M. Roshdi Rashed (Paris) is preparing editions and detailed studies of all the treatises mentioned above.

[16] Cf. Michele Amari, *Storia dei Musulmani di Sicilia*, Vol. 3, Firenze, 1868, pp. 692–5.

[17] *Ibid.*; Charles Homer Haskins, *Studies in the History of Medieval Science*, 2nd edition, Cambridge, Mass. 1927, p. 248.

[18] Haskins, *Studies*, p. 245; cf. also p. 247.

[19] Amari, *Storia*, 3, p. 692; Haskins, *Studies*, p. 249; Clagett, *Archimedes*, 4, p. 33, no. 1; *idem*, "A Medieval Latin Translation," pp. 359–60.

[20] For what follows cf. Hans Niese, "Zur Geschichte des geistigen Lebens am Hofe Kaiser Friedrichs II," in: *Historische Zeitschrift*, 108 (1912), 473–540; C.H. Haskins, "Science at the Court of the Emperor Frederick II," in: *Studies*, 242–71; Ernst Kantorowicz, *Kaiser Friedrich der Zweite*, Berlin 1931, 313–30 and Ergänzungsband, 149–55; M. Grabmann, "Kaiser Friedrich II und sein Verhältnis zur aristotelischen und arabischen Philosophie," in his *Mittelalterliches Geistesleben*, 2, München 1936, 103–37; Heinrich Schipperges, *Die Assimilation der arabischen Medizin durch das lateinische Mittelalter* (= *Sudhoffs Archiv* Beiheft 3), Wiesbaden 1964, 164–85.

[21] For the full text cf. Ibn Sab'în, *Correspondence philosophique avec l'Empereur Fréderick II de Hohenstaufen*. Texte arabe publié par Şerefettin Yaltkaya, avant-propos par Henry Corbin, Paris 1943; see also M. Amari, "Questions philosophiques adressées aux savants musulmans par l'empereur Fréderick II," in: *Journal asiatique*, 5th ser., 1 (1853), 240–74.

[22] Cf. Haskins, *Studies*, 249, 253, 259, 265, 316; E. Wiedemann, "Fragen aus dem Gebiet der Naturwissenschaften, gestellt von Friedrich II, dem Hohenstaufen," in: *Archiv für Kulturgeschichte*, 11/4 (1914), 483–5; H. Suter, "Beiträge zu den Beziehungen Kaiser Friedrichs II. zu zeitgenössischen Gelehrten," in: *Abhandlungen zur Geschichte der Naturwissenschaften und der Medizin*, 4 (1922), 1–8. Cf. also M. Steinschneider, *Die hebraeischen Übersetzungen des Mittelalters und die Juden als Dolmetscher*, Berlin 1893, rpd. Graz 1956, p. 3, on the correspondence over mathematical questions between Frederick II (and his court philosopher) and the eighteen-years old Jewish scholar Judah b. Salomon ha-Kohen ibn Matqah of Toledo (about 1237).

[23] Cf. R. de Vaux, "La première entrée d'Averroès chez les Latins," in: *Revue des sciences philosophiques et théologiques*, 22 (1933), 193–245; M. Grabmann, "Kaiser Friedrich II ..."; Fernand van Steenberghen, *La Philosophie au XIIIe siècle*, Louvain-Paris 1966, p. 110–15; R.A. Gauthier, "Notes sur les débuts (1225–1240) du premier 'averroïsme,'" in: *Revue des sciences philosophiques et théologiques*, 66 (1982), 321–74.

[24] R. de Vaux, "La première entrée," p. 202.

[25] Roger Bacon in fact mentions a converted Jew named Andrew as having been Scot's collaborator. Andrew has been identified by Haskins (*Studies*, p. xv) as Master Andrew, canon of Palencia (Castile). This means that Scot was helped by Andrew only during his Spanish period, so that in order to produce translations at Frederick's court he must have collaborated there with other scholars knowledgeable in Arabic. Cf. also "Anatoli" in: *Encyclopedia Judaica*, Jerusalem 1971, vol. 2, 927–9.

[26] Cf. *Hebräische Bibliographie*, vol. 6 (1863), no. 31, note 2; vol. 7 (1864), no. 39, pp. 62–66, 136. Also: M. Steinschneider, *Die hebraeischen Übersetzungen*, pp. 432–4.

[27] J. Perles, "Die in einer Münchener Handschrift aufgefundene erste lateinische Uebersetzung des Maimonidischen 'Führers,'" in: *Monatsschrift für Geschichte und Wissenschaft des Judentums* 24 (1875), 9–24, 67–86, 99–110, 149–159, 209–218, 261–268; also printed separately, Breslau 1875.

[28] This had already been noted by Amari; cf. *Storia*, 3, 705 ff.

[29] That Moses was writing in Southern Italy, probably at Naples, can be inferred from the fact that he studied with Jacob Anatoli and from his acquaintance with Petrus de Hibernia (i.e. Peter of Ireland, Thomas Aquinas' teacher of the *artes liberales* at the University of Naples between 1239 and 1243). Moses mentions as his "associate" Nicolo di Giovenazzo, identified by Steinschneider (*Hebräische Übersetzungen*, p. 433) as the Dominican Nicolo Paglia da Giovinazzo (1197–1255). On the commentary cf. J. Sermoneta, "Moses b. Solomon of Salerno and Nicholas of Giovinazo on Maimonides' 'The Guide of the Perplexed'" (in Hebrew), in: *Iyyun*, 20 (1969), 212–40.

[30] W. Kluxen, "Literaturgeschichtliches zum lateinischen Moses Maimonides," in: *Recherches de théologie ancienne et médiévale*, 21 (1954), 23–50; *idem*, "Die Geschichte des Maimonides im lateinischen Abendland als Beispiel einer christlich-jüdischen Begegnung," in: *Miscellanea Mediavalia*, 4 (Berlin 1960), 146–166.

[31] As it has already been in: Giuseppe Sermoneta, *Un Glossario filosofico ebraico-italiano del XIII secolo*, Rome 1969, p. 31–42. My conclusions partly overlap those of Professor Sermoneta.

[32] Kluxen indeed remarks that it is "strange" that Moneta was acquainted with the *Guide* so early in northern Italy ("Literaturgeschichtliches," p.33). He tries to account for this uncomfortable fact by noting that Moneta was writing against heresies which his order was fighting in southern France ("Geschichte des Maimonides," p. 157). Moneta himself was, however, fighting heresies in northern Italy and there is no evidence to connect him with southern France.

[33] Cf. Kluxen, "Literaturgeschichtliches," p. 33 and below, p. 44.

[34] Ephrem Filthaut, *Roland von Cremona und die Anfänge der Scholastik im Predigerorden*, Vechta 1936, p. 21 f., 23–25. Roland's practice was not original to him. For a detailed, distressing, account of the repression of the heresy in Southern France between 1229 and 1244 cf. C. Schmidt, *Histoire et doctrine de la secte des cathares ou albigeois*, Paris-Genève, 1, 293–327.

[35] Quoted after Etienne Delaruelle, "De la croisade à l'université: La fondation de l'Université de Toulouse," in: *Les Universités du Languedoc au XIIIe siècle* (=Cahiers de Fanjeux, 5) Toulouse 1970, 19–34, on p. 34.

[36] Cf. Delaruelle, "De la croisade à l'université," and Yves Dossat, "L'Université de Toulouse, Raymond VII, les capitouls et le roi," in: *Les Universités du Languedoc*, 58–91. As is well known, Aristotle's writings were taught in Toulouse from the outset: probably the pontifical legate, Cardinal Romano, who was the protector of the university, had "larger views" than those prevailing in Paris, believing that Christian thought might well assimilate, and correct, Aristotelism (Steenberghen, *La philosophie au XIIIe siècle*, p. 104). In fact, those who taught in Toulouse were Dominicans as e.g. Roland of Cremona and John of Garland.

[37] H. Graetz, *Geschichte der Juden*, Bd. 7, Leipzig 1873, p. 8. On the intellectual relationships between Jews and Albigensians, cf. Joseph Shatzmiller, "The Albigensian Heresy in the Eyes of Contemporary Jews" (in Hebrew), *Commemorative volume for H.H. Ben-Sasson* (Jerusalem, 1989), pp. 333–352 and the literature indicated.

[38] There are differences of opinion over details, but these do not concern us here. For what follows cf. e.g. H. Graetz, *Geschichte der Juden*, 7, p. 31–64; J. Sarachek, *Faith and Reason. The Conflict over the Rationalism of Maimonides*, Williamsport 1935, p. 73–127; A. Shoḥat, "Concerning the First Controversy on the Writings of Maimonides" (in Hebrew), in: *Zion*, 36 (1971), 27–60.

[39] H. Graetz, *Geschichte der Juden*, 7, p. 39; Shoḥat, "Concerning the First Controversy," p. 35.

[40] Cf. F. van Steenberghen, *La philosophie au XIIIe siècle*, p. 100, 106 ff.

[41] This conclusion is confirmed by the following, hitherto unnoticed fact. Writing in 1234, during and a little after his stay at Toulouse, Roland of Cremona mentions Maimonides twice and he is, in fact, the first Latin writer to do so. However, Roland displays such an erroneous and distorted knowledge of him (cf. Filthaut, *Roland von Cremona*, p. 72), that it is plain that he derived his information from oral communication and not from reading.

[42] R. de Vaux, "La première entrée d'Averroès chez les Latins," p. 200; cf. also Haskins, *Studies*, p. 250.

[43] E. Filthaut, *Roland von Cremona*, p. 27–8; Haskins, *Studies*, p. 246 f.

[44] R. de Vaux, "La première entrée," p. 205–19. The famous letter purportedly addressed by Frederick to the university of Bologna to announce his gift of books (and which was held to be authentic by de Vaux) is apparently a forgery; cf. Gauthier, "Notes," p. 322–30. This does not, however, exclude the possibility of the gift itself, nor does it undermine de Vaux's analysis of the political context in which the translations were made.

[45] H. Graetz, *Geschichte der Juden*, 7, p. 59.

[46] Cf. Moritz Steinschneider, "Die hebräischen Commentare zum 'Führer' des Maimonides," in: A. Freimann and M. Hildescheimer (eds.), *Festschrift zum siebzigsten Geburtstage A. Berliner's*, Frankfurt a/M 1903, 345–63.

[47] Steinschneider (ibid., p. 363) lists five such commentaries; cf. also his *Mathematik bei den Juden*, ed. by A. Goldberg, Hildesheim 1964, p. 144, 218–220. The list is certainly not complete: for instance, Falaqera's extensive discussion of the two lines (cf. below) is not included.

[48] Cf. the Appendix.

[49] Clagett in fact published two versions, designated as A and B, the second being "a scholastic adaptation" of the first. As could be expected, the Hebrew, having been made from the Arabic (cf. below), corresponds to version A. There are virtually no variations except for the following fairly trivial one: at 5.16 Clagett added "indefinitely" not found in the Latin text; it is however there in the Hebrew.

[50] Clagett, *Archimedes*, 4, p. 476.

[51] Bibliothèque nationale, Paris, héb. 687, f. 148^{r}. Here is the entire relevant passage: "It has been made clear in a book of the *Conic Sections* that lines, between which there is a certain distance at the outset, may approach one another the further they go, but without ever meeting. Thus the existence of something that cannot be imagined and which cannot enter within the net of imagination has been demonstrated." (Translation adapted from that of S. Pines; cf. above note 2).

[52] Almost all the verbs are different (although, of course, they are synonyms). Most interestingly: the anonymous translator of *On Two Lines* uses the standard term "mḥudad 'agol" for a cone; Falaqera uses the Arabic term "makhruṭ" to which he nonetheless adds "'agol". (The printed editions of Falaqera and at least some of the manuscripts get "makhruṭ" wrong as "mabruṭ," being unfamiliar with this Arabic term.)

[53] Cf. Falaqera in: *Encyclopedia Judaica*, 6, 1140–43.

[54] Falaqera, *Moreh ha-Moreh*, 60–61. I have slightly corrected the printed text according to a manuscript (Bibliothèque nationale, Paris, héb. 706, f. 43^{r}). The translation of the passage from *On Two Lines* (see following note) has been adapted from Clagett, *Archimedes*, 4, 49 in accordance with Falaqera's text.

[55] Corresponding to Clagett, *Archimedes*, 4, p. 44, Proemium, lines 1–6.

[56] Cf. Joseph Kaspi, *Maskiyot Kesef*, in his *'Amudey Kesef u-Maskiyot Kesef*, ed. by S. Werbluner, Frankfurt/M 1848, p. 80 f.

[57] Cf. M. Steinschneider, *Mathematik bei der Juden*, p. 122–6. My conjecture agrees with the following remark of Steinschneider: "Auf Jakob ben Machir und Kalonymos werden wir also hauptsächlich geführt, wenn wir einigen, allerdings wenigen, älteren hebräischen Schriften begegnen, welche sich als Übersetzungen kennzeichnen, aber keinen Namen eines Übersetzers kundgeben" (*ibid.*, p. 121–2). Jacob ben Machir's productive period is the last third of the 13th century and this, it seems, rules him out as a possible translator of *On Two Lines*. The treatise *On Five Bodies* is apparently a Greek text of which only the Hebrew translation (done on the Arabic) is extant; cf. Y.T. Langermann and J.P. Hogendijk, "A Hitherto Unknown Hellenistic Treatise on the Regular Polyhedra," in: *Historia Mathematica*, 11 (1984), 325–6 and Y.T. Langermann, "An Unknown Greek Geometrical Text" (in Hebrew), in: *Qiryat Sefer*, 58 (1983), 199.

[58] Cf. *Encyclopedia Judaica*, 6, 299–301.

[59] Cf. Clagett, *Archimedes*, 4, p. 239 (end of note 46).

[60] Cf. the Appendix, mss nos. 1 and 2.

[61] Cf. supra, note 44 [Added in proof: These treatises have now been studied by T. Lévy in his paper 'L'étude des sections coniques dans la tradition médiévale hébraïque," *Revue d'histoire des sciences* 42 (1989), 193–239.

[62] M. Provençal, *Be'ur 'Inyan Shney Qawim*, to be found at the end of certain copies of the 1553 Sabionetta edition of Maimonides' *Guide* (unpaginated).

[63] Clagett, *Archimedes*, 4, pp. 345–51.

[64] *Ibid.*, p. 351–2.

[65] *Ibid.*, p. 356.

[66] *Ibid.*, pp. 354–7.
[67] *Ibid.*, pp. 256–7, 354.
[68] Joseph Salomon Delmedigo, *Sefer Ma'yan Ḥatum*, 57, in: *Sefer Elim*, Odessa 1867, p. 424–6. The "great man" in question is of course Francesco Barozzi. Elsewhere Delmedigo mentions Efodi and Provençal among those who have written on the subject. Cf. Abraham Geiger, *Melo Chofnajim. Biographie Josef Salomo del Medigo's*, Berlin 1840, Hebrew section, p. 18; translation: p. 23 f; cf. also Geiger's comments in note 70, p. 68–9.
[69] Yair Ḥayyim b. Moses Samson Bachrach, *Ḥawat Yair*, Frankfurt a/M. 1699, responsum no. 174, p. 165^{v}.
[70] "The knowledge of counting bears upon sensible reality, but [its object] stretches further and further to infinity. So also the science of geometry, *al-handasah* in Arabic, [bears upon] the sensible which stretches further and further until it disappears from the eye, the end existing only in the intellect, just as in an infinite march. So also are two lines between which there is a certain distance at the outset and which may go forth in such a way that the further they go, this distance diminishes and they come nearer to one another, but without it ever being possible for them to meet even if they are drawn forth to infinity." Isaac Ibn Latif, *Sefer Rab Pe'alim*, ed. Samuel Schönblum, Lemberg, 1885, 21^{r}.
[71] "Infinite increase is impossible inasmuch as magnitude is [taken to be] in absolute body, even if we do not postulate this to be a natural body. For body, whatever body it may be, is comprehended within the size of the world. Ibn Rushd [therefore] says that since in its existence line is not separate from matter, the geometer who postulates a line greater than the world postulates something wrong and false. [...] And Ibn Rushd further says that the geometer need not at all postulate such a line, for the proof bearing on the long and on the short line is one and the same. According to my own opinion, however, occasionally the geometer must postulate such a line. For instance when, defining the parallel lines, he says that if protracted infinitely to either side they do not meet. Indeed, lines which do not meet when drawn to an extent equal to the size of the world are not necessarily parallel. This is self-evident. The same holds of what the geometer says of two lines which, the further they go, come closer but whose meeting is impossible, even if they are drawn forth to infinity." Levi ben Gershon (Gersonides), *Supercommentary on [Averroes'] Intermediate Commentary on Aristotle's Physics* III, iii, 5; Bibliothèque nationale, Paris, ms héb. 964, f. 54^{v}–55^{r} and héb. 937, f. 18^{r}. For this reference too I am indebted to Y.T. Langermann; cf. also Charles Touati, *La Pensée philosophique et théologique de Gersonide*, Paris 1973, p. 224, note 17. Gersonides invokes the asymptotes also in his "Notes on Euclid's *Elements*"; cf. J.Z. Carlebach, "*Liqutim mi-Kitvey ha-Ralbag*," in: M. Stern (ed.), *Festschrift zum vierzigjährigen Amtsjubiläum des Herrn Rabbiners Dr. Salomo Carlebach in Lübeck*, Berlin 1910, Hebrew Section, 151–178, at p. 157.
[72] "That the possibility of infinite increase is not incompatible with being actually limited may appear from the case of infinite decrease. [...] It has been demonstrated in the book on *Conic Sections* that it is possible for a distance infinitely to decrease and still never completely to disappear. It is possible to assume, for instance, two lines, which, by how much farther they are extended, are brought so much nearer to each other and still will never meet, even if they are produced to infinity. If, in the case of decrease, there is always residual distance which does not disappear, *a fortiori* in the case of increase it should be possible for a distance, though infinitely increased, always to remain limited." Quoted after Harry A.Wolfson, *Crescas' Critique of Aristotle*, Cambridge, Mass. 1929, p. 207. On Crescas' "mathematics of the infinite" see also Tony Lévy, *Mathematiques de l'infini chez Ḥasdai Crescas: Un chapitre de l'histoire de l'infini d'Aristote à la Renaissance* (unpublished Ph.D thesis, Université de Paris-Nord, Department of Mathematics, 1985) and his *Figures de l'infini* (Paris, 1987).
[73] Added in proof: As e.g. Gershom ben Shlomo (second half of the thirteenth century), in his *Sha'ar ha-Shamayim*, Roedelheim 1801, 76^{a}; Warsaw 1875, 73^{a}. Also Alfonso, the author of the philosophical-mathematical treatise *Meyasher 'Aqov* (ed. and trans. by G.M. Gluskina, Moscow 1983), in all likelihood Abner of Burgos (1270–1350), who after his conversion to Christianism took the name of Alfonso de Valladolid, was apparently acquainted with it: he formulates (p. 193; cf. also p. 153 f) the problem of constructing asymptotes in a wording recalling that of *On Two Lines*. Alfonso's solution, however, is very different from those found in the tradition of *On Two Lines*; rather, it is based on the construction of a conchoid. According to Y.T. Langermann, Alfonso's solution was known to Mordekhai Finzi in the middle of the fifteenth century; cf. Y. Tzvi Langermann, "The Scientific Writings of Mordekhai Finzi," in: *Italia*, 7/1–2 (1988), 7–44, on pp. 33–9.
[74] Michel de Montaigne, *Essais* 17 ed. by Alexandre Micha, Paris 1969, II, pp. 236–7. I am grateful to François de Gandt for this reference.

L.E. GOODMAN

MAIMONIDEAN NATURALISM*

A telling criticism of the mechanistic tradition in science is made by Pierre Teilhard de Chardin in his celebrated cosmological meditation, *The Phenomenon of Man.*[1] Natural scientists have concerned themselves largely, perhaps exclusively, with just one of the two basic forms of energy of which we are aware, the outwardly directed or "tangential" energy by which bodies affect one another. The inwardly focused or "radial" energies by which things are centered and integrated in themselves and through which they are drawn, in seeming defiance of the second law of thermodynamics, towards ever higher levels of complexity and integration, have been neglected or ignored. All energy, Teilhard remarks, almost incidentally, must be assumed to be psychic in nature. But the radial sort, as the foundation of heightened complexity, is the prototype of consciousness.

Teilhard's two sorts of energy, radial and tangential, sustain a curious complementarity – mutually dependent, yet not reducible to each other's terms – as though locked in a sort of whirling dance, like twin rotating stars whose identity and distinctness are defined, for the moment, by one another's presence. Teilhard's terminology, in the nature of the case, is somewhat solecistic, and his thesis itself is rather opaque – perhaps, as he suggests, because science does not give us (as experience clearly does) a means of encountering consciousness: We cannot render subjectivity an object like other objects without eliminating all that makes it subjective. Still less does science hand us those inner dimensions of existence in inarticulate beings which are the prototypes – in medieval terms the "matter" – of consciousness. Yet, despite its inherent difficulties, Teilhard's point needs perennially to be made, lest the drive toward completeness in our physical models of nature be mistaken to imply the comprehensiveness of mechanistic models, and a dimension be overlooked that runs through nature as pervasively as the "tangential energy" normally studied by the natural sciences. Without this "other energy," no finite thing would exist. For none would have a determinate form.

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[1] *An earlier version of this paper was presented at the International Conference on Neoplatonism and Jewish Thought, Honolulu, 1987, and published in the proceedings.

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 57–85.
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Our penchant for seeking to objectify the unobjectifiable as energy runs back at least as far as the Stoic notions of *tonos* and *pneuma*.[2] But to avoid confusion we should probably drop that sort of naming, at least in its most familiar applications, where it encourages more confusions than it forestalls. Teilhard uses the term energy in a somewhat more generic, more Aristotelian sense than does our physical science. If we trace the concept back as far as the philosophy of Maimonides we find still functioning there the differentiated Aristotelian concepts of force or power (*dynamis, quwwa*) and task, act, work or function (*ergon, fi'l*), laid out in a neoplatonic scheme as one variety of cause and effect; for Plotinus recognized that a power is no mere passive receptivity.[3] Plotinus was building upon the pervasively teleological conception of causality pioneered by Aristotle, for whom *energeia* refers to that actuality which is both the goal of activity and the source of the powers which make action possible (*Metaphysics* VIII 8, 1049b 5, 1050a 9; 9, 1051a 4–5). Maimonides finds in neoplatonism a means of fleshing out Aristotle's sketchy account and resolving some of its ambivalences between transcendent and immanent causation. In the Torah he finds warrant for regarding the neoplatonic view as congruent with the Biblical one and hints that enable him to correct the neoplatonic view when it seems in jeopardy of falling short of its goal.

Maimonides, like Teilhard, is persuaded by the weaknesses of mechanism and dualism to treat all forms of energy spiritually.[4] He takes to task the neoplatonic Aristotelians of his day for failing adequately to exploit the opening given them by the role of matter in their metaphysics for addressing the central problems of theology – finitude, privation, providence (its possibility and limitation)[5] – problems which Maimonides grouped together under the paradigmatic rubric of theophany, the Rabbinic issue of the chariot (manifestation of the Infinite in finite terms). By neglecting to apply the fundamental discovery or axiom of their own philosophy, that all actuality is form or spirit (and that prime matter, accordingly, is the mere principle of otherness), the neoplatonic philosophers had made matter a realm apart and generated within their own system a dualism which made problematic (and needlessly so by their own premises) not only the relations of governance between mind and body, God and creation – but even the act of creation itself.[6]

Modern philosophers tend sometimes to think of some form of Cartesian dualism as the ancestral or "background level" position of philosophy. Even Plato, despite his identification of being with the hypostatic Forms and his loyalty to the Parmenidean conception of the ultimate reality, is often assimilated casually to some form of dualism. And Aristotle again is treated as a dualist, despite his retention of the Platonic formula identifying *ousia* with forms – now brought down to earth.[7] So the problem of the ghost in the machine (and the related but larger problem of the larger but related Ghost beyond the natural machine) are made to appear much more pervasive (and medieval philosophers much more naive) than they were in fact. The neoplatonic synthesis is regularly overlooked. Yet, in its diverse monotheistic recensions, for centuries it afforded an integrated view of nature by locating the Platonic Forms as thoughts of an Aristotelian divine intelligence (thus obviating the Peripatetic worry about

freestanding Forms[8]) and made those forms the mediating principles between the pure and absolute perfection of the Divine and the partial and relative perfections found in the material world – principles of intelligibility, as in Plato, but also principles of activity (energy), as the Aristotelian demand that explanatory principles have a causal role[9] requires.

The purpose of this paper is to explore the Maimonidean version of this classic mode[10] of integrating the cosmos within itself and with God. Our aim, however, is not to uncover historic curiosities but to discover modes of thinking that might help us with some of our own persistent philosophic difficulties. Our task in that sense is one of critical appropriation. Curiously, but not surprisingly, we find Maimonides himself engaged in a similar task. For he couches his emanative naturalism in terms of a critical appropriation of the Biblical and Rabbinic idea of angels.[11]

I. ANGELS AS FORMS AND FORCES

Maimonides discriminates two kinds of angels: permanent and transitory. He warrants the distinction Rabbinically by the typical Rabbinic expedient of discovering an aporia in the dicta of the Sages. For traditionally angels are thought to be immortal (*ḥayyim we-kayyamim*), but the Midrash relates, "Each day the Holy One blessed be He creates a band of angels, who sing their song before Him and go their way" (Genesis Rabbah LXXVIII; cf. *Ḥagigah* 14a). How is this dictum to be squared with the idea of immortal angels? "The answer is that some are enduring and some transitory. And that is what is in fact the case. For particular forces come to be and perish continually, but the kinds of forces endure without disruption."[12] Maimonides' proposed solution to the problem of integrating the temporal with the eternal is appropriately Platonic. His suggestion that angels are forces and kinds of forces is borne out by another Rabbinic dictum: "No angel performs two missions, and no single mission is performed by two angels." This, Maimonides urges, lifting the passage from the midrashic idiom in which it is embedded, is an explicit avowal on the Sages' part, that angels are forces – an avowal that will be transparent to the wise, since they know that "every force has its own action (*fi'l*), specific to it and does not have two."[13] The types of forces, which are enduring by Maimonides' account, correspond to the angels construed as immortal beings. In Aristotelian parlance they are the disembodied intellects. Their message (for they remain intermediaries, as the Hebrew *mal'akh* implies) is the content of their thought; for they are thinking beings. Imparted one to the next and ultimately to the world, this thought is the objective, active, organizational form and force within things.[14] In us the corresponding form becomes the subjective answering rationality by which we apprehend the essences of things and thereby understand them.[15]

God does not act upon the world directly but through the mediation of natural forces. Paradigmatically, He burns things by means of flame. Thus, "God spoke to the fish and it vomited out Jonah," means that God imparted the volition to the fish, not that He made the fish a prophet![16] The ignorant, who think pictorially, imagine that God acts (and then only in rare and

dramatic instances) by sending gigantic emissaries with bodies composed of fire. They do not understand that God's real majesty and might are manifested not in such displays but in "bringing to be powers that act invisibly within a thing."[17] God is not "in" the created objects that are His instruments but rather acts through their actions, as their Creator.[18]

Arguing from a famous midrash designed to promote consultation, a gloss on the use of the plural in Genesis 1:26 ("Let us make man in our own image"), Maimonides elucidates his equation of enduring angels with the Platonic forms. As the Sages gloss the passage: "The Holy One blessed be He, as it were, does nothing without consulting His supernal retinue." Maimonides marvels that the very word *consulting* was used as well by Plato for the Creator's resort to the eternal forms of things.[19] These forms are the celestial intellects themselves, the heavenly host; for forms do not exist alone.[20] The thoughts in the minds of the hypostatic intellects are identical with those intellects; for as Aristotle explained in *De Anima*, the thought, the thinker, and the act of thinking are one and the same.[21] God's determination to "consult" the universal forms, which are the patterns of all things, is the basis of creation. Yet the intellects themselves are created as specifications of the divine Perfection and Intention.[22] And the world is created by God's thinking the forms those intellects contain. For the correspondence between God's thoughts and reality is not reflective like ours, but projective, inventive, productive, by way of emanation.[23] The disembodied intellects and souls of the spheres are the abiding intermediary hypostases, and the transient forces governing all natural events are the ephemeral causes.

Glossing Psalm 94:6–9, "Will He who emplanted the ear not hear and He who formed the eye not see," Maimonides argues that the design in nature – manifest in the human frame – bespeaks an intelligence not present in nature itself but capable of governance through the characters it imparts to things, allowing vision by devising the appropriate character and arrangement in the aqueous and vitreous humors, membranes, nerves and sinews of the eye: For one cannot think that such an arrangement of materials, each with character and placement so ideally disposed to its function, came about by chance.[24] The characters or natures Maimonides refers to are the patterns of the transient forms. They thus instantiate the abiding forms, the thoughts of God, by which the world is given being. But God acts immanently, *through* the aqueous and vitreous humors. One must not suppose, Maimonides insists, that the "planting" of eyes was done *by means of eyes*, as though the argument were that "the Creator of the mouth must eat and the Creator of the lungs must shout":

"The clear sense of the argument is that any maker of any sort of tool could not make it without conceiving its function. The correct analogy is that a smith could not make a needle in the form needed for sewing well unless he had the concept and understood the nature of sewing."[25]

God's wisdom, unknowable in itself, can be inferred from the objective wisdom manifest in nature. But the linkage of God's wisdom to nature, classically called governance or providence, is not on all fours with the processes of nature but works through a higher order idea like the plan of a

designer, who does not *use* the tools he makes but relies on an implicit understanding of their tasks. God conceives the enduring forms of things and instantiates them in particulars.

> There is a great difference between a maker's knowledge ... and someone else's. For the ... maker simply followed his understanding ... But for anyone else ... the knowledge must follow the product ... the craftsman who made this case, with its weights moved by the flow of water to mark the passing hours of day or night, must know and understand the whole course of the water through it and each turning it takes, every thread that must be pulled and every ball that must drop. But he does not know these movements by studying them now as they occur. Rather these movements ... come to be only by his understanding. Not so with one who studies this instrument. For him each new movement he sees gives him new knowledge, and he continues to study and gradually to enhance and augment his knowledge until he has attained an understanding of the instrument as a whole. Supposing that the movements of this instrument were infinite, the investigator would never understand it comprehensively and would never be able to know even one of its movements before it occurred. For whatever he knows is derived from what *has* occurred.
>
> This is just the situation with existence as a whole *vis à vis* our knowledge and God's. Whatever we know, we know only through study of what exists. That is why our knowledge does not attach to the future or the infinite. Our sciences grow and vary with the objects from which our knowledge is derived. Not so with Him. His knowledge is not *a posteriori*, so that it should involve multiplicity and change. Rather things follow His prior knowledge, which makes them as they are, whether as disembodied beings, as enduring material particulars, or as changeable beings whose pattern of change is undisrupted and invariant.[26]

Maimonides' emphasis on the specificity of the forms bespeaks his naturalism. The proof-texts he draws from scripture to corroborate his interpretation of angels as forces or powers are earnest of the comprehensiveness of his project: When God shut the lions' mouths (Daniel 6:23), or made Balaam's ass halt (its speech was a subjective event in the consciousness of the prophet), He acted through an angel – that is, through natural forces in the animal. Strikingly, "even the elements are called angels: 'Who makest the winds His angels, the flaming fire His ministrants' (Psalms 104:4)." When the Rabbis wonder how Judah could have been moved to visit a prostitute (Genesis 38:15–16) and R. Yohanan reasons that Judah intended to pass by but for the intervention of "the angel appointed over lust," Maimonides seizes the usage to clinch his argument that a natural force or type of force can be called an angel – because, in fact, all forces are angels: "this is the explicit teaching of all our Books. For you will find no reference to any act of God in them except by way of an angel, which you already know means a messenger: Thus anything appointed to a charge is an angel – even the motions of animals, including those that are inarticulate."[27] The two phases of the emanative causal sequence,

then: the localized forces resident in bodies, and the disembodied ideal types of those forces in the detached intelligences. Every natural process or event is derived from its neoplatonic first principles via its own proper proximate causes, themselves intellectually disposed.[28] Nothing is left to the play of chance, if the term 'chance' is understood to suggest an uncaused outcome.

Maimonides rejects the *Kalâm* occasionalist doctrine of God's immediate causation of each event[29] on the theological grounds that such causation would render much of God's creation otiose. If our food is not necessary to our nourishment or sustenance, or not sufficient in due measure to nourish and sustain us, then it was otiose for God to create it.[30] God does not, in fact, proceed directly to His goal (like an imperfect being impatient of perfection) but rather leads finite beings mediately to theirs. For the correct interpretation of the dictum that God created all things for His glory is that God created each thing for its own sake – to progress towards its goal: in the human case, realization of our inner likeness to God Himself.[31] As babes are fed on milk before achieving solid food, and as the Israelites were led via the wilderness rather than directly to the promised land, and enculturated through sacrificial worship before they learned to pray, and through prayer before they learned of silent contemplation of God's Perfection, so each thing requires its history. No step can be left out.[32]

Maimonides rejects the Epicurean claim that chance is an active force in nature: A central role is denied to chance by the regularity of the causal process. Natural events, as Aristotle argued, happen always or for the most part in uniform patterns. Such patterns require causal explanation. The name chance is therefore properly shifted, as it is in Aristotle, from the non-existent realm of the uncaused to the realm of the unusual or unfamiliar: Chance is not an absence but a superfluity of causes.[33] "Chance" events result from the intersection of sequences not regularly associated in nature, because their causes normally operate independently. But even in these cases there are causes, not only for the individual events but even for their juxtaposition. What we cannot analyze under the formal aspect of nature, as an expression of God's wisdom, we refer to chance. But the notion, so applied, is purely subjective, referring – if Biblical parlance be taken seriously – to God's will, which is, in fact, by the arguments of radical monotheism, no different from His wisdom. All causal trains run back to the natural motions engendered by the rotations of the spheres and to the governance of the celestial intelligences, which contemplate God's perfection and manifest that contemplation by projecting the forms of things on nature.[34] All actions pursue the good, as constructed by each being and type of being. Volitional actions are motivated ultimately by the pursuit of perfection, which articulate beings construe under the guise of some subjective good.[35]

The existence and the properties of natural objects are not necessary in absolute terms. For God was under no logical compulsion to create or to impart the natures we observe. But given that God did choose being over non-being for the world and did specify the characters of things as He did, there is a (relative and internal) necessity in the cosmos.[36] The whole is like a single

organism[37] with its own settled order. And that order does not change essentially within itself, but things operate by the essences they are given: Elements and their compounds and complexes, monovalently; animate beings, volitionally.[38] God acts through emanation, and what emanates are the natural forms of beings, including the souls of all living things (said to be in God's hand), and the rational soul of man – said to be in God's image.

Some of the "angels" which enamate from the divine are conscious; others are not. Among the former, of course, Maimonides counts the disembodied intelligences and the souls of the spheres, but also the human soul. Even animal souls have some measure of consciousness, although not rational thought and choice; for all animals, as in Aristotle, have perception and volition. The forms of inanimate things are not conscious. Their rationality is objective rather than subjective. But the forms in each being are the active, causal factors, existentiating each as an exemplar of its kind and founding its dispositional characteristics, by which it expresses its nature.

In keeping with Rabbinic exegetical practice, Maimonides embeds a small aporia in his own text on emanative naturalism, designed Socratically to prompt an inquiry and an inference: Among the Rabbinic texts he cites to warrant the claim that the principal parts of the cosmos include animate and intelligent beings entrusted, by delegation, with the governance of nature, is one that oddly seems to warrant the quite un-Aristotelian and un-Maimonidean claim that the earth is intelligent as well as the spheres. For just as we read that "The heavens declare the glory of God" (Psalms 19:2), teaching us that "the spheres are living and rational," so at the beginning of *Genesis* we read that "the earth was *tohu* and *bohu*," which the Rabbis (in a gloss that Maimonides approves) interpret to mean "mourning and weeping." The earth bewailed the fact that although the heavens were created with her, they were alive and aware while she was dead.[39] The aporia lies in drawing the claim from the testimony of the earth itself. Comparable personifications only a few lines earlier were taken by Maimonides as proof that Scripture and the Rabbis assumed the heavens to be conscious and alive.

The resolution of the aporia arises from the equivocal status of matter, for earth is the paradigm of physicality. As a principle of otherness, prime matter is a mere abstraction, a concomitant, Maimonides argues, of finite being, but not a being itself – still less to be numbered among "the sons of God" – that is, the principles of being.[40] Yet "even the elements are called angels."[41] Matter becomes articulate to the extent that it is governed by form, that is, by the ideas that enamate from the Divine; relative to the heavens the elements are dead.[42] They are the most primitive actual instances of matter and achieve actuality by virtue of the specificity of form, with which they are endowed. Elements are said to speak by a license beyond the poetic license of personification – a licence which depends upon the fact that they have been assigned determinate characters and identities, that is, by virtue of the fact that they are not pure prime matter but actual existents.

Maimonides makes some remarkable claims in behalf of the celestial intelligences: Not only are they alive, intelligent, enduring beings, but also

(unlike Islamic angels[43]) they outrank humanity in the scale of being – a crucial point in Maimonides' arguments for humility as a human virtue and against the notion that man is the goal and cynosure of creation.[44] Moreover the disembodied intellects exercise a rather paradoxical sort of volition: The spheres and intelligences apprehend their own actions, choose rationally and govern, but not as we choose and govern. For all our choices and decisions address emergent events (*lâkin laysa mithla ikhtiyârinâ wa lâ tadbîrinâ, allâdhi huwa kulluhu bi-'umûrin mutajaddidin*) – that is, new events about to take place, over which our choices and decisions will exercise a determining impact. The angels, by contrast, are given no arbitrary discretion. Thus the angel says to Lot: "I cannot do anything" (Genesis 19:22), and again (in Exodus 23:21), God's angel exercises no discretion "for My name is in him." Human beings are allotted choice and may choose wisely or unwisely; but the consciousness of the "angels," on which depend the motions of the heavens and operation of all natural processes – through these motions and through the forms imparted by the Active Intellect – is perfectly informed and chooses always "for the best," in accordance with the dictates of God's wisdom.[45] Their "choices" are not immediate but eternal.

Clearly part of Maimonides' intention in his remarkable passages about angels is to demythologize:

> If you told one of those men who purport to be the Sages of Israel that the Deity sends an angel that enters the womb of a woman and then forms the foetus, that would impress him and he would accept it as an expression of God's greatness and power and an instance of His wisdom – although still convinced that an angel is a body of flaming fire one-third the size of the entire world – supposing that all this was perfectly possible for God. But if you told him that God placed a formative power in the semen, by which limbs and organs are shaped and demarcated, and that this is the angel, or if you told him that the forms of all things are the work of the Active Intellect and that this is the angel constantly mentioned by the Sages as the magistrate of the world, he would recoil at such a view. For he does not understand the real meaning of greatness and power.[46]

The truth is that "all forces are angels"; and the Rabbis called an angel the third part of the world (Genesis Rabbah X) not to suggest its size, but to show the place of spiritual, that is, intellectual beings in the cosmic order: Angels, that is disembodied intellects and forms, the bodies of spheres, and the continually changing bodies of the sublunary world, constitute the three types of created being. Only in the poetically charged imagination of the prophet is an angel actually envisioned:[47] Angels are invisible because they are forces or powers, the generative forms which organize and enliven the natural world, differentiating it from mere chaos – and, indeed, from nonexistence. They are perceived from their effects; apprehended, when we understand the structures of natural things and the characters and causes of natural processes. Yet, if Maimonides' goal is to demythologize, why does he insist that "angels" are

conscious, rational, volitional beings? Has he escaped the confines of Midrashic mythology only to ensnare himself in the myths of the Philosophers?

2. TWO KINDS OF VOLITION

The forms, forces or angels that are permanent, as distinguished from those that are distributed in matter (divided with its divisions and dissolved when their work is finished[48]), are conscious, intelligent, rationally choosing beings. They are delegated the governance of nature in accordance with their (invariant but inexorable) choices. Clearly Maimonides' naturalism is not reductionistic in a physical direction. His retention of the Biblical and Rabbinic language, referring to the powers that govern nature as angels, despite his vehement rejection of the mythic image of an angel, is far more than a mere *façon de parler* or shallow bow in the direction of tradition. We gain an insight into his intentions from his insistence that the articulacy of the angels is not explicit but inner, like the silent consciousness of the meditative man who contemplates the Divine as he lies still upon his bed.[49]

Maimonides' treatment draws on a tradition that goes back to Plato's enunciation of Socrates' disappointment with the philosophy of Anaxagoras. Anaxagoras had promised, Socrates complains, to show that the world is governed by intelligence. If so, the young Socrates reasoned, one ought to find from reading Anaxagoras how all things are governed for the best, as intelligence requires: "Somehow it seemed right that mind should be the cause of everything, and I reasoned that if this is so, mind in producing order sets everything in order and arranges each individual thing in the way that is best for it ... I thought that by assigning a cause to each phenomenon separately and to the universe as a whole he would make clear what is best for each and what is the universal goal." Instead, however, *nous* in Anaxagoras' system proved a fairly adventitious principle, lacking the power of governance for the good which Socrates reasoned that divine intelligence must exercise.[50] Aristotle carries the same criticism further, arguing that the ultimate causal principle responsible for the cosmic order should not operate externally, like a *deus ex machina* in a bad play, but from within, through the inner dynamic of each player's actions.[51]

Both Plato and Aristotle devoted central attention in constructing their philosophies to emending the weaknesses they had found in Anaxagoras. Plato fused reality, causal power, rationality and goodness in his conception of the divine. Aristotle gave special emphasis to the immanence of divine causality by arguing that the being of things (the "what-it-is-for-a-thing-to-be") is specific to that thing and amounts to the nature each sort of thing develops and expresses in its actions in the world. All processes are teleological in the sense that they head toward a goal (completion), whether or not that goal is consciously articulated, and regardless of the fact that the endpoint of one natural process may be (must be) the initiation of another.[52] Platonically one can say that essences *specify* the universal idea of the Good. Aristotle renders the same conception dynamic and more pointedly causal by differentiating the material

ground, telic goal and mediating formal and active principles that govern the action of all things in nature. For each species, the pursuit of pure actuality and emulation of pure perfection are expressed by the interpretation of actuality or perfection in a specific natural mode of action or of life. Things realize themselves through their pursuit of goals. For no atemporal essence is ever wholly present in any particular at a given instant. And no single goal is ever comprehensive of all good.[53] God rules the world as He moves it, through the attraction towards divine perfection expressed in their diverse ways by the very essences which are the presence in each thing of that measure of pure actuality which properly belongs to each natural kind.

In the perspective of this tradition, it becomes quite intelligible how Maimonides can claim that the Aristotelian (by which he means neoplatonic Aristotelian) affirmation of consciously choosing intellects associated with the spheres is congruent with Biblical and Rabbinic views. To be sure, Aristotle is an eternalist and Maimonides is a creationist. But the means by which Maimonides will account for God's relation to the world – God's governance and even God's creation of the world – are the same emanationist means as those that the neoplatonic philosophers had derived from their study of the metaphysics of Aristotle and Plato. Granted the world is distinct from God, and the intelligences and forms are not to be deemed divine – still less the forces they induce in natural particulars – nonetheless, these forms and forces and the consciousnesses which represent the highest rung attained among imparted forms are "emissaries" of the divine. They do God's will, not by acting for Him but (like the breath of life God breathed into Adam) by imparting to things the power of acting for themselves.

If the incorporeal intellects are to play the role assigned to them, it is necessary that they be consciously choosing beings; for the specifications they determine are not exhaustive of the logical possibilities for finite being. Similarly, the intellects of the spheres must choose in order to govern – to steer and pilot the great ship entrusted to them.[54] Yet the choices made by the disembodied intelligences follow a single uniform pattern. The cosmos will not take an alternative course to the one it actually follows – not because its motions are automatic but because the guiding intelligences choose always for the best.

This seems a strange admission for Maimonides to make, since he himself criticizes the neoplatonic Aristotelian philosophers for purporting to assign to God the determination of the existence and character of all things yet simultaneously denying any real alternative possibilities: The cosmos of the philosopher, as an eternal existent, becomes a necessary existent. Its character too is necessary. All things in nature must be as they are. It is highly problematic in that case, Maimonides argues, for the Philosophers to assign to God the authorship of the cosmos.[55] Al-Ghazâlî argued, in the proof that forms the precedent for Maimonides' criticism, that it is contradictory for the Philosophers to ascribe the world's constitution to God's free act or volition, if the world would have had the same character regardless. What can be meant by the notion of God's choice, if there were no real alternatives for it to range over?[56]

Now the same criticism might be applied to Maimonides himself. How does it make sense to say that natural events are brought about by rational choices of the angels (rather than, automatically or mechanically) when the "choices" of the angels will never eventuate other than as they do and their outcomes are in fact the same that any mechanist would identify as the regular outcomes of physical causes? There are two problems for Maimonides to clear up here, both hinging on his curious insistence on applying the language of rational volition to the governance of nature: (a) Why is such governance called volitional at all, when by Maimonides' own standards volition must confront real alternatives? Why does Maimonides insist on applying the notion of volition when he is equally insistent on the absence of arbitrary discretion? Has he somehow abandoned the Aristotelian standards he applies throughout his discussion of human and divine volition: that voluntary choices are those which might eventuate in several different outcomes, whereas events that occur in accordance with nature are distinguished as such by the fact that only one outcome is possible given a particular set of starting conditions?[57] And (b) what function does cosmic volition play in Maimonidean nature when Maimonides is at pains to ensure that the system he describes would generate no event incompatible with natural science? If we can answer this pair of related questions, we come to the heart of Maimonides' naturalism, the distinctive basis of his dissatisfaction with mechanism and automatism.

(a) The theological-cum-modal question rests on a rather superficial confusion and is easily cleared up by logical considerations: God's choice does confront real alternatives: being or not being for the cosmos, this set of natural principles or that. Likewise with human choices: We confront the choices between life and death, the blessing and the curse.[58] The notion of alternative futures (implied in the very logic of the divine commandments and particularly in the ordinances that demand we take precautions against causing injury to others) does not imply the reality of alternative *actualities*. Only one actuality will ever be real. The other possibilities are virtual. There is no rabies on Oahu, there never has been, and perhaps there never will be. But to grant those facts is not to deny the possibility of rabies on Oahu and therefore abandon all precautions against its introduction. An event (pace Aristotle) is not to be called impossible merely because it will never take place. Accordingly, an option is not impossible merely because it will not be chosen. On the contrary, *to speak of choosing among alternatives is to acknowledge their possibility within a given framework of assumptions and to abstract from the assumptions which exclude or necessitate one alternative or another.* To speak of God's choosing to create the world or to create the world in a certain way is to abstract from the considerations (be they what they may) which actually govern God's choice and to make reference only to a looser framework of assumptions in which that choice is not constrained. Perhaps God's choice to create the world was directed by His generosity, and withholding of creation was excluded by God's grace. But when we speak of choice we mean to abstract – as much as to say that leaving grace and generosity out of the question, the world need not have

existed.[59] The same analysis, of course, can be applied to any determinations, including human choices. When Maimonides says that human choices deal with emergent events or ephemera he addresses the contingency of outcomes: If Zayd makes a parapet on his roof,[60] he may prevent a particular catastrophe that might otherwise have occurred. If he fails to do so, an event that would otherwise have been impossible might become actual. But Zayd is the sort of being that can fail, through negligence, fatigue, distraction or forgetfulness.

What of the "choices" of the disembodied intelligences? God chooses to create; and, were it not for His generosity, might have chosen otherwise. Nothing in the nature of finite being determined Him to act, for it did not exist. Similarly, God chose the nature of the world. A variety of different sorts of cosmos are compatible with the logical requirements of internal coherence.[61] God chose this one, the one that operates by these natural principles. But these principles, according to Maimonides, are not abstract "laws" but determinants. They are in fact disembodied intelligences, the beings traditionally called angels, prime objects of divine creation. Their actions are invariant. Their "choices" are not irresolute in execution, and their steadiness is the constancy of the natural system. The instances they govern are the forces that order and inform matter. They are purely intellectual (thus disembodied, fully actual, causally potent and conscious) forms. These intelligences choose in the same way that they were chosen: by delegating to what lies beneath them inwardly centered, natural control, for each thing, over its own motions and expressions, in accordance with the natures (rational or non-rational) chosen and imparted by the creative act of God. The intelligences are said to act volitionally, then, because every natural juncture involves confrontation of alternatives. Things might have been determined so or so – not in the sense that, say, appetitive beings confront pragmatic vicissitudes, flexibly, prepared to alter our choices if our actions produce other than the expected outcomes, but determinatively, creatively, specifying the requirements of universal wisdom, with all but infinitely painstaking detail and care,[62] until all the myriad steps have been traversed between the generalized idea of grace and the concrete particularity required for the instantiation of each natural kind and creature. The "angels" do not falter; for it is only for temporal beings that the future is new; indeed it is only for temporal beings that there *is* a future.

I think the reason for Maimonides' assignment of volition – and volition of such a curious kind – to the angels/intellects is his desire to maintain a naturalism which respects the regularities of the cosmic order, without, through that very commitment, subjecting nature to the fatal necessity of strict, intellectualist determinism. To explain: In the emanative schemes of al-Fârâbî and Ibn Sînâ, God brings about the world through a mediating sequence of disembodied intellects, each of which is not only caused (timelessly emanated) but entailed by what lies above it. As a result, it seems, the entire emanative sequence becomes a matter of necessity. God's act too is seemingly a matter of necessity. As such, it becomes eternal and loses the contingency which should have been the chief differentia of creation from God Himself. Human freedom and natural contingency are compromised beyond preservation when all events

become matters of mechanical or indeed logical, geometrical implication from first principles. The Aristotelian doctrine of the eternity of the world is then emblematic of this entire system, in which divine creativity has been made somehow mechanical and automatic.

Following al-Ghazâlî, Maimonides argues that if emanation means the necessitation of the world by God, it will be difficult, if not impossible to explain how a differentiated and changeable world comes to be at all, let alone how freedom or contingency are possible. Only volition, al-Ghazâlî had argued, can introduce diversity into what is otherwise simplex and undifferentiated. And al-Ghazâlî makes a point, for this reason, of insisting on the role of volition in God's act of creation from the outset, and of insisting on the preservation of volition in the action of "first principles."[63] When Maimonides takes over these arguments from al-Ghazâlî he moderates them in the interest of naturalism, insisting that what God chooses is what will become "the settled order of nature," and consigning miracles that seem to violate that nature to "the twilight of the sixth day" of creation, in keeping with the traditional midrashic device for subordinating specific extraordinary events to the general, ordained scheme and pattern of nature. But, like al-Ghazâlî, Maimonides preserves the volitional character of the angels/first principles, lest the aspect of liberty and contingency that voluntarism introduces into nature be lost before it is allowed its full effect. The impact of this decision, to treat the angels as volitional beings (even though what they choose is the order of nature) is to prevent the natural order from seeming to be absolutely or permanently fixed, allowing it to lapse back into the necessitarianism of logicist or intellectualist neoplatonism, from which theistic voluntarism had only just rescued it.

The move is portentous or suggestive for our own purposes, not in the sense that one might hope in the twenty-first century to resurrect some form of animism or hylozoism, but in its resonance with our own post-evolutionary recognition that nature is not something that is merely finished but something that must (continually) be chosen, and that analogues of choice operate at every level, down to the subatomic, in (continually) determining what nature shall be. In critically appropriating what is of lasting value in Maimonides' approach, we would press further in the direction of his own stress on the inner workings of natural choice at the junctures of contingency, which in our world would be understood as evolutionary. We would place no emphasis at all on poetically personified hypostases, whose personae it is Maimonides' intention to resolve. But the projection and pursuit of a good by each natural being remains as vital a supplement to mechanism as it was when Maimonides signalled the inadequacy of automatism in accounting for emanation, or when Socrates said that if all things are ruled by intelligence they should be directed toward the best. Volition in the "angels," even when they are construed as forms and forces, performs a specifying function that no mere automatism can achieve alone. Choice, specification of what need not have been, Maimonides argues, is the only factor that ensures that divine creativity and governance are not halted at the level of universals but actually reach the world of nature. For, as Aristotle himself taught, despite the Peripatetic denial of particular

providence, nothing exists but particulars.[64] There are no independent universals to be recipients of God's grace.

(b) What then of the cosmological point? If Maimonidean angels answer faithfully to the requirements of the good, obeying God's wisdom as each in its specificity perfectly but partially conceives it, faithfully replicating the very cosmos that would be expected on any rational scientific account, why are the angels retained at all? Why the emphasis on their intelligence and volition, when the same results could be achieved by mechanistic materialism or by a more strictly intellectualist (less emphatically voluntaristic) neoplatonism? Part of the answer has been already given: The rationalistic intellectualism which excludes voluntarism makes both the world and God's act necessary and eternal. At the same time it cuts off the world of particulars from the divine, as though universals somehow were debarred from governing their particulars. One more of the dangers of the exclusively intellectualist view, very obvious to us, is that it excludes empiricism – a failing marked both by Maimonides and by al-Ghazâlî.[65] For it relegates to randomness what it cannot assimilate to wisdom and rational necessity, rather than leaving room for the kind of *a posteriori* recognition of necessity that discovers wisdom in nature even where we did not anticipate it and so allows us to assimilate apparently random events to causal pattern without reducing them to matters of logical inevitability.

As for mechanism, its difficulties seemed obvious to Maimonides: It reduced the causal order to the play of chance. Indeed, mechanism tends to make necessity and chance indistinguishable. It thus has the effect of leaving nature unintelligible and causal regularities unexplained and inexplicable.[66] Where strict intellectualism seemed to carry rationalism too far, making God's choices themselves phenomena to be explained and treating all events as necessary categorically (as though logic were the sole and sufficient determinant of all natural determinacies), mechanistic materialism plainly did not go far enough. By debarring rational principles it made all natural events a mere series of inexplicable motions. Causes and effects become mere givens; every event, a pure positivity, with no principle of explanation to appeal to for understanding or even prediction. We still confront the impact of this irrationalism when our own positivistic heirs to the mechanistic tradition of Democritus attempt (rather lamely and inconsistently) to explain events in terms of natural laws and then turn the ledger to a bankrupt page when faced with the inquiry or the wonder why events should obey such laws.[67] Part of the strength of Maimonides' rationalistic naturalism lies in the very fact that its principles are not abstractions but concrete forces, intelligences which issue orders not as mere commands but through the inward natures and characters of things, which are, in fact, selected and designed – chosen – by the rational principles operative in nature.

Being determinative in their actions, the Maimonidean intelligences are not like ordinary mechanical forces. Yet the choice and consciousness assigned to the disembodied intellects are not like ours either: Their consciousness is of

their own actions; and the choices they make, not dealing with contingent eventualities and ephemeral goals and patterns, are (as Socrates might have hoped) always for the best. This does not mean, of course, that the intelligences act as a kind of predestiny, charting the course of each finite being. On the contrary, such anthropomorphising notions of governance over nature treat the conduct of nature as though it were simply another pragmatic decision sequence handling contingent ephemera. Whereas in fact divine governance operates through the imparting of natural forms. Even in the human case, God's providence is expressed through the imparting of the human form and specifically, the rational soul or human intelligence.[68] Destiny is always causal but never wholly external. In the human case it arises in significant measure from our own acts and choices. We do not choose as angels do, but the capability for choice is the "angel" in us.

Thus there are no Panglossian implications to the Rambam's version of the notion that God governs for the best. For what is chosen by the hypostatized intelligences (from a diversity of alternative virtualities on Maimonides' acccount, which regards strict neoplatonic emanation as too automatic to allow real differentiation and emergence of diversity and multiplicity[69]) is the pattern of nature at each step and stage of its elaboration. What God chooses is not the future of each being but the specificities of grace and nature by which each will freely manifest its own character in its milieu. In this specification, the divine wisdom is expressed in much the manner of a creative artist, where the wisdom is not fully articulated until it is instantiated. Thus the emanative generosity of God finds its meaning in the act of creation itself, not in its abstract virtuality. God, we can say, might not have created; but that would have been no act of grace. This fact is symbolized traditionally, both in the neoplatonists and in the Psalms, by the representation of God's creativity as a fountain of light and life.[70] For light and life are not real until they are imparted; not imparted until they are real.[71] What is entailed in the notion that intelligences of the spheres rule by conscious choice is that what we apprehend as an objective rationality in the cosmos has its roots in a higher, subjective rationality. It is to this matter that we must now turn – Maimonides' version of the answer to the mystery encapsulated in the famous words of Einstein: "The most incomprehensible thing about the universe is that it is comprehensible."

3. INWARD RATIONALITY AND CHOICE IN NATURE

The Aristotelian spheres have fallen, and the neoplatonic intelligences are dispersed. One might almost say that their work is completed. If God is to govern nature, He must govern it Himself.[72] The age of vice-regents is past, and for that very reason the Aristotelian idea of immanence acquires a new and compelling force – although the Maimonidean value of distinguishing what is immanent from what is transcendent remains. But further, the Aristotelian natural forms have proved mutable – as a Plato or a Maimonides might have expected.[73] Indeed they are more mutable than Maimonides suspected. *He* confined evolutionary change to the formative age of the cosmos and preserved

the settled order of nature as an inner necessity against the supernaturalism of the superstitious. But we know that creation is not over. Natural laws are invariant at a rather higher level of abstraction than classical naturalists suspected. Seeming sports of nature prove to be causally significant in a process that may well be unrepeated; its outcomes, unexampled. The universe itself has a history, and chance is not only not the exception but indeed the very medium of causal rationality. New meanings are discovered for the old ideas of Aristotle, Plato and al-Ghazâlî, that time and space are relative to the things within them, or to the perceptions of observers, or the sensibilities of a percipient.[74] Even the idea of concreteness is profoundly altered with the discovery that matter is not what is ultimately conserved, and again with the recognition that the chemical atom is composed of parts and that these in turn are made of particles whose properties are anything but homogeneous with those of the matter they are supposed to constitute.

If any natural object inherits the explanatory primacy of the Aristotelian spheres, it is the electron, or perhaps the quark. But electrons, like the spheres, no longer orbit. Their paths are not continuous curves – indeed they do not seem to be continuous. We can no longer even say of electrons – or of quarks – as once was proposed of the spheres, that they determine events by the locus of their positions. Yet the curious status of our ultimate particles between matter and energy does somehow echo the character once assigned to the curiously non-material matter that Aristotle relied on as the substance of the spheres. And the ambiguous status of light, as wave or particle, seems strangely to echo the ambiguous status of light in neoplatonic systems, between matter and the ideal. Still no one is likely to pretend that photons are alive. What possible meaning can be found for the Maimonidean scheme of angels as forces in a post-Aristotelian, post-Newtonian, post-Darwinian, even post-Planckian age? The beginnings of an answer are hinted in a passage cited by Averroes from Themistius, a philosopher well respected by Maimonides.[75]

Taking exception to an anti-Platonic argument in Aristotle's metaphysics based on the fact that man begets man – hence, that the human form comes to humans from their progenitors – Themistius argued that if "man is born only from man and horse from horse" spontaneous generation becomes inexplicable.[76] Now spontaneous generation is no more live an option today than are the crystalline spheres. But the logic of spontaneous generation – by which species emerge from what they are not – is far more central to our evolutionary sciences than it was to Themistius, where it represented an odd countercase to Aristotelian naturalism, based on uncontrolled observation of marginal phenomena like the supposed generation of bees from dead cattle, hornets from dead horses and the like. In an evolutionary context all species are taken to emerge from precursors which are, in Aristotelian terms, essentially other than they, i.e. which lack the "form" of the emergent species. And all life is thought to derive from what was not alive.

Normally, in our science, such emergence is ascribed to the work of minute particles. For Mendelian genetics has made good on the proposal of Epicurus that the causal principles guiding natural selection should be sought not where

Empedocles sought them, on the level of gross anatomy and function, but on the micro-level, in the germplasm, much coseted from the environment, and capable, on the model laid out by Jacob and Monod and given biochemical configuration by Watson, Crick, Franklin and others, of organizing all the processes of life. But two assumptions common to most evolutionary schemes (whether their end products are living species or galaxies) call for closer examination in our Maimonidean framework: (a) The explanatory particles, at whatever level the analysis ends and synthesis of higher order complexes is begun, have active and dispositional properties by which they express their own character: They move or spin or have a charge to impart. In short, all the particles used in our reductive explanations have distinctive, interactive characters expressive of their own natures. (b) In forming complexes or entering into other sorts of interactions, regardless how evanescent, the lower level particles manifest a drive towards complexity and higher order properties through which emerge behavior and dispositions which are not describable in terms of the properties found in their precursors. We like to say that the higher order properties are explained by the lower, but that is not strictly true. The lower order properties we find in nature describe boundary conditions for the higher but neither predict nor explain them.[77] Indeed they do not even generate the categories necessary to describe the higher order activities, which mechanism ascribes to the unexplained fact of complexity – as though the emergence of chemical activity from physical givens, or of biological activity from chemical givens, or of psychological activity from biological givens were somehow trivially, mathematically deducible from our necessarily spare and reductive descriptions of the more primitive givens. Yet we know and can demonstrate that there is no mathematical process of addition, multiplication or any other functional relationship that can derive the higher order from the lower. For not only are the requisite descriptive categories absent, but they are sought in the wrong direction: The explanatory and predictive power of our reductive sciences rests on abstractive analysis from the very thickness and complexity it seeks to explain, whereas here what we seek to explain is complexity itself, and emergence. Our mode of inquiry and discovery must be synthetic and material rather than abstractive and analytic: Arithmetic will never "explain" geometry without the postulation of space, and chemistry will never explain psychology without the postulation of thought. Biology lays the basis but does not "contain" the outcome.

We cannot reduce biology to physics without remainder for the simple reason that what we note in physics abstracts away from all that is distinctive to biology. Physical laws are formulated to cover both living and non-living systems and attain their generality by ignoring the activities specific to living beings, which *exploit* the properties of matter, not "defying" them but *using* them to attain ends that matter considered *as* matter could never attain. Where science achieves generality by abstracting from the complexity and "thickness" of phenomena, it loses explanatory power over the specificities that are the quick of evolution. What emergence defies is not the general principles of nature but reduction to the terms of such general principles.

Mechanism ascribes the attainment of higher ends to complexity. But that is a clear case of disguising an abstract description of the effect as a reductive explanation of the cause, like saying that intelligence is a matter of problem solving or that opium acts through the *virtus dormitiva*. Here what we seek to explain is complexity itself, a certain kind of complexity – not turbulence or chaos, but a kind of order. In the emergence of life from non-living matter, organic ends are projected beyond the elemental ends of the given. Matter exhibits such properties as impenetrability and inertia; compounds show acidity and basicity. But out of these properties new goals are constituted, by complexes capable not just of *pursuing* such goals but of projecting (and enlarging) a meaning for them: survival, reproduction, efflorescence, biological evolution.

Theorists of evolution who recognize the emergence of complexity tend to treat the fact not as a phenomenon but as a tautology: Of course the complex emerges from the simple, what else could it emerge from? Emergence represents not a tendency but the exception to the general rule of breakdown. Stability, complexity, and higher order properties are not values pursued by lower forms but mere names for that which successfully persists, the delicate toy that rests glistening atop the slag heap of disordered wastes and failed attempts. Insensibly, iridescently the claim that emergence is a tautology verges into the charge that emergence is a paradox. The notion of stability or success is bundled into a neutral seeming package. Life and consciousness become random fragments of a random walk rather than (as in Plotinus) a grand procession (*prohodos*) or (as in Maimonides) a cosmic panorama – nature passing before Moses in the panoply of its kinds (*Guide* I 38) as what "follows from" – what *emerges* from the will and word of God. By this means emergence is assimilated to the random noise around it and ceases to stand forth as an achievement or a gift. And the value of the initial given, along with the values generated by evolving beings themselves in setting out their own goals and ends, is dismissed to the grey and neutral realm of pure facticity, the inexplicable facticity that positivism acknowledges but cannot explain.

Simultaneous with the assimilation of the emergent to its background comes the paradoxical insistence on the ultimacy of disorder. It would take us far afield to excavate the anthropomorphisms and projections latent in metaphysical applications of the idea of entropy, to urge reinstatement of the Aristotelian and Spinozistic insight that order and disorder, being value concepts, are *in our application of them* (as Maimonides himself insists for all human applications of value notions – *Guide* I 2) necessarily tinged with subjectivity. We must await another occasion to attempt to reenliven, as a wholesome alternative to all anthropomorphising views of evolution and devolution, the Aristotelian response to Empedocles' first falling foul of love and strife: the recognition that the breakdown of one thing is the build up of another.[78] What is pertinent here is the recognition that there is evolution in nature. To this we may add a recognition of ecological opportunism based very much on reading the Second Law of Thermodynamics in an Aristotelian spirit: Energy is not wasted in the cosmos if waste itself can be a resource – if a world as rich as ours can be sustained by the casual effluence of a middle class star like the sun.

Spinoza captures the dynamic of the two evolutionary assumptions far more forthrightly than do most evolutionary theorists when he generalizes them to being at large: The essence of each thing is its tendency to preserve and promote its own being – not statically but through the expression of its own character and the elaboration of that character towards perfection, insofar as in it lies. Here despite (or perhaps because of) Spinoza's strictures against teleology of the anthropomorphising and anthropocentric type, we see the basis of a new, yet, at the same time, properly Aristotelian teleology, in which all things in pursuing their own goals pursue perfection and by so doing, as Maimonides puts it, express the glory of God – or, as Spinoza puts it, express infinite being, each in its own way (*Ethica* I, def. 6). The means by which they do so, in Maimonidean language, are the essences imparted by God. For Maimonides is emphatic in maintaining that the disembodied intelligences from which stem the forms are nothing apart from God, and matter itself is nothing but the condition of otherness by which God gives freedom or existentiation to finite particulars.[79]

In her efforts to rehabilitate Aristotelian teleology, [80] Martha Nussbaum is at pains to exclude as un-Aristotelian three doctrines which she plainly regards as damaging to the credibility of the Aristotelian approach in a modern scientific context: (i) "the idea of a universal teleology of nature," (ii) the notion of mysterious, "non-empirical" strivings toward the realization of form, and (iii) the inclusion of non-organsmic processes in teleology. She also objects to any effort to disengage matter from form or to see form as anything but the arrangement of matter. It is difficult to see in this context what would become of Aristotle's God, the pure Intelligence which is also pure Actuality, or how form is prevented from becoming always the secondary and passive, dependent variable, rather than the active and actualizing, ontically primary principle that Aristotle's metaphysics wants to make of it and requires it to be. But confining ourselves to the realm of nature and recognizing the indissolubility *here* of form from matter – for surely form cannot actualize when there is nothing in need of actualizing – we must recognize that Maimonides has followed an alternative line of interpretation to Nussbaum's in integrating the Aristotelian concepts of form, matter, telos and efficient cause – an alternative, closer to that of Joseph Owens than to that of Nussbaum, but not necessarily bad Aristotle, or bad philosophy, and not necessarily as incompatable with the findings of our sciences as Nussbaum fears. There are good grounds for including non-organic processes in teleology, especially if we accept, as Nussbaum does, the distinction between objective and subjective ends. The goal of a process need not be conceptualized or envisioned by the actor in the process. Aristotle (like Spinoza) likes to speak in relative terms – of some actors as more articulate than others in reference to their goals. Clearly, in evolutionary terms, no integrated organic system focused on (and thereby constituting) higher order goals is possible unless it can be built of components whose conatus is toward lesser, simpler, non-conceptualized goals.

The idea that such a conatus is a non-empiric "mysterious striving" towards the actualization of form is quite un-Aristotelian. To be sure, no ontic *élan* or

thrust can ever be sensorily detected. But Aristotelian induction makes it clear that a nisus in each thing towards the expression (and preservation, elaboration) of its character is the common theme in all finite beings. There is nothing to save in Aristotelian teleology if we discard the notion of unconscious and inchoate goals. For the very essence of Aristotle's teleology is the distinction between the ends, which all processes in nature have, and the purposes, which only deliberating beings have. Speaking Spinozistically, we do not depart far from the thought of Aristotle if we say that the conatus of each thing is its essence, and that this is a fact experientially derived, although no conatus is a sense datum.

As for a general causal plan or universal teleology, Maimonides concurs with Nussbaum's suspicions of this notion, if the phrase "universal teleology of nature" intends the assignment of a single overall anthropomorphic purpose to God, as in the thesis (enunciated, although significantly qualified, by Saadiah) which Maimonides anticipates Spinoza in rejecting: that God made all things for man and man that he might worship God.[81] Maimonides, as we have seen, holds that God made all things in the first instance for their own sakes. Things glorify God in pursuing their own perfection. For in so doing they manifest, each in its own way, one aspect of the perfection of God. In this sense, on a meta-level, there *is* a general teleology of nature for Maimonides. The same is true, of course, for Aristotle: That is why the love and strife schematism of Empedocles must be rejected. It relies on separate principles to explain creation and destruction (order and entropy) instead of recognizing that in a single system of nature only one (but very general) principle is required or relevant, since build up and break down (like our oxidation and reduction) are the same process viewed from opposite perspectives. The single necessary principle is that of perfection.[82]

Each being in nature has an end or good of its own. It is for this reason in part that the term 'good' is systemically (*pros hen*) ambiguous for Aristotle. But there is no comfort for the relativism of the Sophists here. As in Spinoza, and Maimonides, whom Spinoza follows on this point, the recognition that finite beings have partial and partisan perspectives on the good is seen not to entail that all differences in levels of perfection are subjective or that one segment of being is no better than another – the grub or speck of dust on a par with the inspired lawgiver and poet. The notion of a universal good remains applicable by reference to the common orientation of each thing toward its own perfection – a specification of the pure actuality and orienting perfection of God. Of course the idea of the Good does not specify the particularities of perfection. Each species and particular must do that for itself, to the best of its ability. But the fact remains that perfection, in all these diverse ways, is what is sought. And in that sense the work of the "angels" is not empty or vacuous, as though it contributed no directionality whatever to creatures' striving.

Nussbaum argues that Aristotle might have had a notion of general or cosmic teleology had the concept of an ecosystem been available to him, but she denies that such a concept was accessible to Aristotle. Yet Aristotle has the idea of a single integrated cosmic system; and his distinctive use (against

Empedocles) of the Heraclitean notion that "the way up is the way down" perfects that concept and allows for a characteristically Aristotelian ecology: Since the breakdown of one thing is the build up of another, energy in Aristotle's sense is not lost in the cosmos but systematically recycled by the action of the spheres and under the influence of the intelligences – there is no loss of complexity for the cosmos as a whole. It was for this reason in part that Aristotle's successors kept alive the ancient equation of the cosmos with an organism.

We cannot retain Aristotle's confidence in the absolute stability of the cosmic plan. But Maimonides, following the lead of al-Ghazâlî and Philoponus, long ago found excessive the Aristotelian claims for the stability of the cosmos. One of his great contributions was to disentangle the Aristotelian idea of the consistency of natural law from the metaphysical notion of an unalterable nature. As for ourselves, we expect neither unlimited cosmic "progress" nor necessarily (as in Philoponus) a universal cosmic endgame, but continued opportunities for evolution, accompanied by continued liabilities to decline – the two being by no means mutually exclusive.

Clearly, for Aristotle, if there were no notion of integrating all causes in a single system (one cosmos) there would not be much point in taking to task Anaxagoras for failing adequately to integrate the rationality of Nous into the account of nature, nor would it be clear why Aristotle should place Nous, in the climax of his own systematic exposition, at the helm (but not anthropomorphically) of the entire cosmic system, or why – for that matter – at the outset of this ethics (*Nicomachaean Ethics* I 1) he should build upon an axiom that treats means which have no ultimate end as having no end at all. Maimonides profits from the neoplatonic recension of Aristotle's metaphysics by discovering in it a subtle account of how it can be possible for the form or essence of each thing to be both its project and its charge from God. It is in this conception that Maimonides finds an affinity between the thinking of the neoplatonic Aristotelians as to forms and ends and the Rabbinic, midrashically enunciated, teachings and Biblical vignettes about angels. The astronomy of the scheme, of course, is quite secondary.

Maimonides, in fact, is rather diffident about committing himself to the Aristotelian cosmological scheme. He is well aware of the weaknesses of Ptolemaic astronomy in accounting for the retrograde motion of the planets[83] and skeptical of claims to knowledge about the celestial beings.[84] He echoes Plato's treatment of cosmology as "a likely story," arguing that the Aristotelian schematization of cosmology is plausible but by no means established or even verifiable, and he stresses Ptolemy's treatment of astronomical theories as mathematical models designed to account for the observed phenomena, not necessarily to describe the cosmos as it actually is.[85] In several passages he disclaims any intention of adding to the store of astronomical theory or information, and in one he urges that there are already enough books speculating on the correct number of the disembodied intellects.[86]

Yet despite these expressions of restiveness with classical astronomy and despite his explicit efforts to bracket the detailed claims of classical cosmology,

Maimonides argues strenuously for the congruence of Biblical and Rabbinic angelology with the Greek cosmological scheme and outspokenly avows as general principles what he presents as its key thematic elements: the existence of non-material beings of an intellectual nature superior in nobility to humanity and exercising volition in the governance of the cosmos.[87] What I have argued is that there is something of value here, to be disentangled from Ptolemaic astronomy, mythic angelology and even Aristotelian cosmology. Maimonides clearly thinks there is. His efforts to give articulation to a thematic or programmatic insight which he sees expressed in quite non-Aristotelian idioms in Scripture and the Rabbinic literature aid us in disentangling that insight once again and endeavoring to articulate it in idioms which do not offend our present scientific beachhead.

The quintessential spheres, slowed by retrogradation, breached by comets and shattered by the laws of paralax that sent them careening into one another, were brought to the ground finally by the very demands of elegance which had erected them. It was no longer necessary to appeal to 55 or 47 or even 10 intelligences to account for the observed celestial motions, when two impersonal forces – gravity and inertia – would suffice, given the adequacy of Newton's principles to account for Kepler's laws. The facts of relativity and the quantum relationships emerge from study of ambiguities in the behavior of light and its emanative cousins and cousins german – electromagnetism, gravity, and the other sorts of forces that might be resident in a body or even propagated where no body is present to support them. The mechanistic materialism once taken as the message of Newtonian physics has given way (yet not entirely and consistently) to a variety of alternative metaphysical readings. Prominent among them are the Whiteheadian deemphasis of substance in favor of events, and the phenomenalistic metaphysic that sometimes passes as radical empiricism or even bravely manifests its allegiance to the old materialism after which it still hankers, but sometimes openly or tacitly avows one form or another of idealism. For moody or disenchanted phenomenalists can still argue that appearances are nothing without subjects and thus that there are no facts without subjective apprehendors – that the very content of physics requires the positing of human subjects. Such arguments, regardless of where they are assumed to lead – whether to subjectivism, humanism, cultural relativism, mysticism, or some form of Buddhism – have no more in them today than they had before the advent of quantum physics. That observations are subjective is a tautology and cannot imply the metaphysically freighted denial that the world would not exist without an observer – a claim about the world which we have no evidence to support.

Both Process Philosophy and the many varieties of subjectivism that have claimed paternity in the new physics seem to rest their most convincing claims on the fact that what we study in physics (and thus what we know about nature) are intelligible patterns among things. This is what Heraclitus and Greek speakers after him, from Plato and Aristotle to Philo and beyond, called *logos*. That was not something subjective, at least not a figment of human thought alone. The tendency to read the intelligibility of nature as an artifact of human

study is a symptom but not a demonstrated consequence of renaissance and enlightenment humanism. The projective/reflexive structure of such a claim is as indicative of its doubtfulness as is the same structure in any other anthropomorphism.[88] We achieve some hope of overcoming subjectivism in our accounts of science by the same means that promise us some hope of objectivity in science itself: desisting from seeking in the cosmos (or in science) only images of ourselves. For the same distaste for narcissism which once taught us not to find an image of ourselves in the sky ought now to teach us not to seek that same image deflected to the sciences, but to structure and angle and cross-calibrate those sciences so that they reflect the world at large and not ourselves alone.[89] Accordingly, the intelligence that we detect in nature (and must detect in order to explain) must not be judged *as* intelligence by the extent of its approximation to a human mentality. Rather, we must recognize its wisdom in its own terms and learn what universal or absolute intelligence is from the inductive study of its work, not from the application to it of our own preconcerted notions.

The same notion, that we can triangulate from our diverse findings to generate some measure of objectivity in science, is expressed, with a slightly different (but still rather Pythagorean) emphasis when modern theorists say that mathematics is the language of physics. What they mean is that a scientific finding is one that answers to formal values such as comprehensiveness, symmetry, rhythm, harmony, and elegance, whose exact character cannot be specified a priori, just as there is no formal definition of a melody, a pattern, or a game, but which are in some measure, in specific circumstances, predictable, given an informed awareness of their context – susceptible to speculative or conjectural anticipation – and confirmable a posteriori.[90]

No one could predict a priori that there were not four but over a hundred elements. Yet, given close observational experience and controlled experimentation with the patterns of behavior of many elements, it was possible in some measure to predict the character and even existence of others – even to generate the conditions in which new elements would produce themselves. The same fact about the nature of science is expressible in Maimonidean terms by saying that scientists study the rationality embedded in nature; in Aristotelian terms, by saying that the sciences study why things must be as they are; in Platonic terms, by saying that they study how intelligence governs all things for the best.

Explicitly, or implicitly the standpoint remains teleological – explicitly in the medieval and classical formulations; tacitly often surreptitiously, in our own: Standards of value are still used in framing viable hypotheses and in recognizing their confirming instances – which still answer to the description Aristotle gave: that in studying nature we will discover craftsmanship such as that of the most skilled artistry.[91] For when mechanists say that stable complexes survive, or that organisms pursue homeostasis, or life or the survival of the species, they are arguing teleologically, whether or not that is their intention. The objective perspective clearly is not human or anthropocentric. But in our haste to avoid describing it as divine (for what is science if not the endeavor to understand the world in some small measure as God does and thereby transcend some of our

human limitations) we conceal the very character of the standards we apply, positivistically deny them (while still using them), or projectively displace them – as we do when we treat them as subjective – as though the order of the world (which in other contexts we feel free to criticize) could somehow be the work of our own minds.

The idea of forms[92] does not die as readily as that of spheres or sphere souls. For matter without form remains a mere virtuality, and all the principles we appeal to in the description or explanation of natural phenomena – forces, fields, charges, dispositions – remain formal characters in things. Nor does Aristotle's profound conception that the linkage between God and nature must be telic die with the gradual rusting of his all too material mechanism for that linkage, which Maimonides, Averroes, and Aristotle himself were more than prepared to bracket as a mere model of what must one day prove to be the case, and which Plato included most emphatically in what he called "a likely story." The ideal that beings strive for, the form they grope to realize as their own – conceptualizable as the orienting goal of their conatus – is, in its immediacy, neither hypostatic nor immanent. Rather, like Philo's *logos*, it remains, through all changes in its conceptualization, a virtuality projected by each individual being, specifically or uniquely, with a characteristic degree of articulacy, propinquity or remoteness.

The Maimonidean claim that the forces governing nature are not only rational but volitional, conscious and intelligent has some salvage value, then, in suggesting an alternative to the positivism that negates the categories of explanation we employ and to the reactive subjectivism that romantically confounds those categories with artifacts of our culture or figments of our psyches: (a) To invoke the notion of choice, as the Rambam does, is to imply that values are at stake, that the determinations we discover in nature are not made among neutral, equally valuable or valueless alternatives but involve a directionality. Something is better than nothing; a world in which evolution occurs is better than one in which no such process is possible – even though not every product of evolution will be concordant with *our* purposes.[93] (b) To invoke the notion of intelligence is to make explicit the claim that a rationality is operative in nature, answerable to our ideas of rationality, although far transcending these, since we at best anticipate the course of divine artistry and never know it a priori.

God governs by delegation in that God leaves all beings to the solution of their own problems, but not without means to address them. Human intelligence is a special case: Here the inner or self-focused energies of a being are brought to a pitch of articulation and integration that allows the conscious and communicable setting forth of values and the assignment of orders of priority among them. At the inanimate and inarticulate levels of being, clearly no such integration occurs. Yet the lower is necessary to the higher, as finite minds cannot act without matter; and, for any action to take place or even the most elemental coordination to persist, some measure of integration is required. It is anthropomorphic to call elemental integration purposive. But all beings have goals – create goals, we must say – in the very acts by which each being

manifests persistence. Such blind gropings as are necessary to the emergence of conscious purpose and the distinction of proper purposiveness from its organic and pre-organic prototypes are referred to intelligence, by license, in the sense that they project a goal; but, in earnest, in the sense that goal-directed and goal-constituting activity presupposes a directionality whose orienting pole is the pure intelligence and pure perfection of the divine.

(c) Thus, perhaps most importantly, to find hallmarks of the intelligence that governs nature in the forms of things (not in the celestial bodies alone of course, but in all parts of the cosmos) is both to make that intelligence knowable and to deny that its apprehension depends on our projection. It is to locate in each thing the groping towards choice made by the conatus which is the being and the value of that thing. If the heavens are not alive, as Maimonides hoped, neither is the earth as dead as he supposed: The universe is rife not only with living beings but with the possibilities of life, light and consciousness. These come not from our perception but from things. They argue the governance of God with the same silent voice that bespeaks the possibility of science: When beings grope toward the definition of their future and the future of their kind they do not do so because we might say they do or as we might say they should. The values that direct their determinations are their own – most often fully articulated for the first time and thereby made actual in the very act of their selection. To understand the world is to see it not from our own perspective but from that of things themselves – that is to say, from the perspectives which the grace of God unselfishly, or to use Plato's term, unstintingly imparts. Even the elements have their silent song to sing.

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NOTES

1 London: Collins, 1959, 62–66.
2 See Shmuel Sambursky, *Physics of the Stoics* (London: Routledge Kegal Paul), 1959, 1–48.
3 See *Enneads* V 3.15; cf. III 8.10, 2; V 4.2, 38.
4 See Maimonides, *Guide* II 12; and cf. Ibn Ṭufayl's *Hayy Ibn Yaqẓân*, tr. L.E. Goodman (Boston: Twayne, 1972; repr. Los Angeles, 1991), 125–127.
5 *Guide* III 16.
6 See *Guide* III 16; cf. I 17, 28, II 13. Maimonides follows Saadiah's lead in treating theodicy as one of the few legitimate problem areas in theology. He follows Aristotle himself, but more specifically the tradition we know as represented by al-Kindî and al-Āmirî, in assimilating First Philosophy to theology. See Dimitri Gutas, *Avicenna and the Aristotelian Tradition* (Leiden: Brill, 1988) 238–53; Everett Rowson, *A Muslim Philosopher on the Soul and its Fate*. Of the two major families of issues addressed in the *Guide to the Perplexed* – the Account of Creation and the Account of the Chariot – Maimonides treats the former as a special case of the latter: The problems of cosmology and cosmogony (philosophical "Physics") are a subset of the problems of theophany, God's manifestation in finite terms (metaphysics or theology). Rival schools of thought – creationism, interventionistic occasionalism, the laissez faire theology of the Epicureans and the eternalistic naturalism of the Aristotelians – accordingly lead to corresponding positions with

regard to providence and creation. The idea that the principal problem of metaphysics is the emergence of the many from the one is, of course, neoplatonic.

[7] See Joseph Owens, *The Doctrine of Being in the Aristotelian Metaphysics*, 3rd ed. (Toronto: Pontifical Institute of Medieval Studies), 1978, 315–74.

[8] Dillon traces the placement of the Forms in the mind of God as far back as the Middle Platonists and ultimately to Plato himself: *The Middle Platonists* 6, 95, 255, 410, with *Timaeus* 35A, *Laws* X. Plotinus fuses Aristotle's *Nous* with Plato's realm of forms, referring to the now content-filled thought-thinking-itself as Being. The synthesis of Alexander of Aphrodisias was crucial in making the transcendental intelligibles objects of the thought of *Nous*.

[9] *Metaphysics* A 9, 991a8: "Above all one might discuss the question what on earth the Forms contribute ... For they cause neither movement nor any change ..." Peirce is one of the few modern thinkers to take cognizance of theories of the type we are discussing. He writes (in a paragraph cancelled by Langley but restored by Wiener): "Another philosophy which had some currency in England in Hume's time was the theory of a 'plastic nature,' that is to say, a slightly intelligent agent, intermediate between God and the universe, God's factotum, which attended to the ordinary routine of administration of the universe. This theory was so much out of date that I should not have mentioned it were it not that I suspect it aided considerably in bringing into vogue the phrase 'law of nature' in England, an expression which the sectaries of the plastic nature might very naturally, and in fact early did employ. One of them, for example, Lord Brooke, in a work published in 1633 ..." C.S. Peirce, ed. P. Wiener, 297. I am indebted to Jim Tiles for the foregoing reference. Peirce has little use for Brooke's line of thinking, finding its explanatory principles too non-specific (or tautologous!). But since the aim was not directly to explain effects but to mediate between the universal and the particular, the concept remained in use down to the 18th century.

[10] Philo, following Platonic, Stoic, Rabbinic and Scriptural hints and suggestions, is clearly an architect of the approach, for his *logos* partakes of both of objective and subjective rationality and thus mediates between the absoluteness of God and the finite particularity of the world. Philo, like Maimonides, calls the ideas powers, following *Sophist* 247DE; he makes them subordinate to God and in effect answers Aristotle's charge (n. 9 above) by treating the ideas as the active (*energoun*), organizing principles of nature. See *De Mutatione Nominum* 21, 122 and *De Specialibus Legibus* I 8, 45–48 and H.A. Wolfson, *Philo*, 1.217–18; cf. David Winston, citing *Phaedo* 95E and Diogenes Laertius 7, 147 in *Logos and Mystical Theology in Philo of Alexandria* (Cincinnati: Hebrew Union College Press, 1985), 19.

[11] The identification is not confined to the *Guide to the Perplexed*. See Maimonides *Code*, I, *Hilkhot Yesodei Torah* 2.7, ed. and tr. M. Hyamson (Jerusalem: Feldheim, 1974) 36a, where the highest echelon of angels, the scriptural *ḥayyot*, are called forms (*ẕurot*).

[12] *Guide* II 6, Munk, 2.17b, II, 14–17.

[13] *Guide* II 6, Munk 2.17b, II, 5–6. The usage which refers to emanative energies as forces or powers is precedented in Arabic in al-Fârâbî's *Fî 'Aql* (*De Intellectu et Intellecto*), ed., M. Bouyges (Beirut: Catholic Press, 1939); tr. A. Hyman, in Arthur Hyman and James Walsh, eds. *Philosophy in the Middle Ages* (New York: Harper and Row, 1967), 211–21.

[14] *Guide* II 5, citing Psalms 19:2–4.

[15] For the complementarity of rationalism and empiricism in this type of account of knowledge and discovery, see my *Avicenna* (London: Routledge, 1992), chapter 3.

[16] *Guide* II 4, Munk 2.14ab; II 48, citing Jonah 2:2.

[17] *Guide* II 6, Munk 2.17b, II. 1–3; cf. *De Generatione Animalium* II 3, 736b 26–737a 11.

[18] Thus 1 Kings 19:11–12: " ... and the Lord was not in the wind ... the Lord was not in the earthquake ... the Lord was not in the fire: and after the fire was a still small voice ..." Maimonides cites the passage in *Guide* II 41 in justifying his account of prophecy, which neither reduces prophetic inspiration to a matter of subjective appearances nor treats it as a matter of divine indwelling but relies upon the (creationist) mediating scheme of (neoplatonic, intellectual/formal) angels between the divine Absoluteness and human intelligence.

[19] *Guide* II 6, Munk 2.16b–17a. The Rabbinic text Maimonides cites echoes Sanhedrin 38b but the verbatim citation is unknown. The celestial retinue are called God's *pamalya* (cf. the Latin *famulus*), servitors or ministrants, not peers. Plato speaks of the creator (i.e. the demiurge) consulting the forms at *Timaeus* 28b, 29ab, 30c.

[20] See *Guide* III 18.

[21] *De Anima* III 4, 429a 15–16, 430a 3, 5, 430a 17–20; *Guide* I 68, Munk 1.86b; *Code* I, *Hilkhot Yesodei Torah* 2.10.

[22] *Guide* I 48. Philo reaches a similar conclusion.

[23] *Guide* III 21.

[24] *Guide* III 19.

[25] *Guide* III 19, Munk 3.40.
[26] *Guide* III 16, Munk 3.43b–44a.
[27] *Guide* II 6, Munk 2.16–18.
[28] Cf. al-Ghazâlî, *Tahâfut al-Falâsifa*, The Incoherence of the Philosophers, ed. M. Bouyges (Beirut: Catholic Press, 2nd edn., 1962): "Our second point addresses those who grant that these events flow (or emanate) from the First Principles of temporal events ..."
[29] This is what Peirce, perhaps recognizing its Islamic origins, called "explanation *à la Turque*"; ed. Wiener, 296.
[30] *Guide* III 17, II 13; cf. III 31.
[31] *Guide* III 13, I 1; "Eight Chapters" 5, echoing Plato's *Theaetetus* 176.
[32] *Guide* III 32. Cf. Miskawayh, *The Refinement of Character, tr. Constantine Zurayk* (Beirut: American University, 1968), 81–83 and my discussion in "Humanism and Islamic Ethics: The Curious Case of Miskawayh," in Brian Carr, ed., *Morals and Society in Asian Philosophy*, (London: Curzon, 1996), 1–22.
[33] *Guide* II 20, citing *Physics* II 4–5; and *Guide* II 12, 48.
[34] *Guide* II 3, 10, 12. For God's "will" and "wisdom," see my "Matter and Form as Attributes of God in Maimonides' Philosophy," in R. Link-Salinger et al., eds., *A Straight Path: Essays in Honor of Arthur Hyman* (Washington: Catholic University Press, 1988), 86–97.
[35] See *Guide* I 2, II 4.
[36] *Guide* II 17; cf. III 15.
[37] *Guide* I 72, II 10.
[38] Maimonides *Code* I, *Hilkhot Teshuvah* 5.2, 5.1, 5.4 viii, Hyamson, 86b–87b; cf. my *Jewish and Islamic Philosophy: Crosspollinations in the Classical Age* (Edinburgh University Press and Rutgers University Press, 1999), 146–200. For animal vitality see *Guide* I 72, Munk 1.102b l. 17–103a l. 1.
[39] *Guide* II 5, Munk 2.15ab. Maimonides emphasizes the inanimateness of the four elements in *Guide* I 72 and argues that if the elements were alive and the forces of nature exercised discretion, confining their actions only to what is necessary, there would be no natural evils.
[40] See *Guide* III 22.
[41] *Guide* II 6, Munk 2.16b l. 10.
[42] *Guide* I 72, Munk 1.100b.
[43] See Qur'ân 2:34 and the commentaries; for Shi'ite views, M.J. Kister, "Legends in *tafsîr* and *ḥadîth* Literature: the Creation of Adam and Related Stories," in Andrew Rippin, ed., *Approaches to the History of the Interpretation of the Qur'ân* (Oxford: Clarendon Press, 1988), 108–9.
[44] *Guide* II, 11, III 12–14. The spheres, being composed of matter, are "impure" relative to the disembodied intellects; but even the spheres are nobler as bodies than human bodies are: They do not exist for our sake. For the nobility of the spheres and intellects, see Abraham Ibn Daud, *The Exalted Faith*, ed. and tr. Norbert Samuelson and Gershon Weiss (Rutherford: Fairleigh Dickenson University Press, 1986), 120b.
[45] *Guide* II 7, Munk 2.18b. Cf. Saadiah, on Job 1:6 in Goodman, tr., *The Book of Theodicy*, 154–59.
[46] *Guide* II 6, Munk 2.17ab. Note the terminological affinity of Maimonides' 'formative power' and the 'plastic nature' mentioned by Peirce.
[47] *Guide* II 6, Munk 2.18b.
[48] *Guide* II, Introduction, Premises 10–12. Natural forms are "forces in a body," but the substantial forms through which a body exists – soul and mind, for example – are not forces in a body or divided even per accidens with its divisions (cf. Aristotle, *De Anima* I 5, 411b 19–27). Maimonides accepts all the premises of the Philosophers, except the eternity of the world, which he treats as an isolable postulate of their system.
[49] See *Guide* II 4, 5, 7, 8, esp. II 5, citing Psalms 19:4, Munk 2.15b.
[50] *Phaedo* 97C–98E. Socrates assumed that if he knew how all things are governed for the best and thus what is best for each, he would know how human beings too should be governed. Cf. Maimonides' understanding of Moses' desire to learn God's ways (the laws of nature), so as to know how to govern the people: *Guide* I 54, glossing Exodus 33:13–20 and 34:6–7.
[51] *Metaphysics* I 3, 984a 11–19, 985a 18; cf. *De Anima* I 2, 405a 14–17; *Poetica* 15, 1454b 1.
[52] *Metaphysics* I 4, 985a 5–29.
[53] Cf. al-Fârâbî, *Kitâb Mabâdî' ârâ' ahlu 'l-madînatu 'l-Fâḍila* (The Book of the Principles behind the Beliefs of the People of the Outstanding State) III 9, tr. R. Walzer as *Al-Fârâbî on the Perfect State*, 145–49.
[54] *Guide* II 4.
[55] *Guide* II 19, 21.

[56] *The Incoherence of the Philosophers*, Discussions 3–4, 10; see my "Al-Ghazâlî's Argument from Creation," *International Journal of Middle Eastern Studies* 2 (1971) 67–85, 168–88; "Did al-Ghazâlî Deny Causality?" *Studia Islamica* 47 (1978) 83–120; RAMBAM, 175–204.

[57] See *Metaphysics* 1046b, 1048a 8–12, and Maimonides, *Guide* II 19; "Eight Chapters," 8; *Code*, I, *Hilkhot Teshuvah* 5.2, with 5.1 and 5.4 viii; see my discussion in *Jewish and Islamic Philosophy: Crosspollinations in the Classical Age*, pp. 146–200.

[58] *Guide* III 17.5 and Deuteronomy 11:26.

[59] To affirm an open future is not to affirm the *actuality* of alternative futures but only the reality of alternative possibilities as possibilities – that is, their virtuality. See my "Leibniz and Futurity," in *Leibniz and Adam*, ed. M. Dascal and E. Yakira (Tel Aviv: University Publishing, 1993), 301–324. If we adopt the notion of emergence portended in Bergson's idea of duration or even in Spinoza's dynamism with regard to the conatus, we can say that even if only one future will be actual, there are a variety of alternative possibilities for that future, since its nature does not become determinate until it exists, that is, until its causes make it actual.

[60] Cf. "Eight Chapters," 8, citing Deuteronony 22:8.

[61] If the position sounds Leibnizian, there is good reason: see my "Maimonides and Leibniz," with Leibniz' reading notes on the Latin *Doctor Perplexorum* (Basel, 1629).

[62] I say *all but* infinitely painstaking care, because had infinite care been taken, the task could not have been completed and finite being could not have emerged. Finitude would have been overwhelmed. Cf. David Novak's paper in L.E. Goodman, ed. *Neoplatonism and Jewish Thought*, (Albany: SUNY Press, 1992), 299–318.

[63] *TF*, 197–98.

[64] *Guide* III 18.

[65] See my *God of Abraham* (New York: Oxford University Press, 1996), 240–241.

[66] *Guide* II 20.

[67] Cf. my discussion of the incoherence of positivism in *God of Abraham*, 73–78.

[68] *Guide* III 25.

[69] See Arthur Hyman's paper in *Neoplatonism and Jewish Thought* (Albany, SUNY Press, 1992), 111–135.

[70] See *Guide* II 12, citing Jeremiah 2:13, Psalms 36:10; *Guide* I 68. The ideas of light, life, being and truth, come together in the Psalmist's fused image a fountain of life which is the source of our enlightenment – the image in which Ibn Gabirol saw the affinity of Biblical poetry to Neoplatonic metaphysics. The elaboration of the intuition is the substance of Ibn Gabirol's metaphysics, as set forth in the papers of Professors Dillon, Mathis and McGinn in *Neoplatonism and Jewish Thought*.

[71] See *Guide* III 21.

[72] Cf. *Guide* I 23, 65.

[73] For Plato insisted that all temporal things are mutable, and Maimonides urged that one cannot make a metaphysical canon of the observed stability of kinds in nature. See *Guide* II 17, 14; cf. Maimonides' suggestive gloss of Genesis Rabbah XXI at Guide I 49: "Through this dictum they state clearly that the angels [sc. forms] are immaterial and have no fixed bodily form outside the mind." Munk 1.55b II 2–4. For what is fixed, by Platonic standards must be ideal, and what is mutable must be sensory and so imaginable.

[74] See Aristotle, *Physics* IV 2; al-Ghazâlî, *Ma'ârij al-Quds* 203-04; *Tahâfut al-Falâsifa* (Incoherence of the Philosophers) Bouyges 2nd ed., 67; *Guide* I 52.

[75] See *Guide* I 71, Munk 1.96a.

[76] *Themistii in Aristotelis Metaphysicorum librum Lambda paraphrasis*, Medieval Hebrew translation, ed. S. Landauer, in *Commentaria in Aristotelem Graeca* 5.5 (Berlin, 1903) 8, cited in Herbert Davidson, "Averroes on the Active Intellect," 202.

[77] See P.S. Schiavella, "Emergent Evolution and Reductionism," *Scientia* 108 (1973) 323–330.

[78] Aristotle, *Metaphysics* Alpha 4, 985a 24.

[79] See *Guide* III 18, 22; cf. I 68, also I 9, with Saadiah, *Book of Critically Chosen Beliefs and Convictions*, II 13 ad fin., ed., Kafih, 115, tr. Rosenblatt, 136.

[80] See her edition, translation and commentary of Aristotle's *De Motu Animalium* (Princeton: Princeton University Press, 1985), 60, 74, 93–98.

[81] *Guide* III 13 with III 25. But Saadiah does not believe that God made all things for man's pleasure or entertainment, but so that man can earn salvation and deserve reward and recompense. And he notes, pointedly, that rain falls on the sea, and not just on our fields.

[82] Thus Maimonides' emphasis on the Aristotelian thesis, still employed by our scientists, that the world forms a single system, and his further emphasis on the Saadianic point that the thesis of the world's singularity is vital to the central claim of monotheism. See *Guide* I 72.

[83] For Maimonides' rejection of epicycles and eccentrics, see *Guide* II 24; cf. I 71, Munk 1.96a; cf. F.J. Carmody, "The Planetary Theory of Ibn Rushd," *Osiris* 10 (1952) 556–86; A.I. Sabra, "The Andalusian Revolt against Ptolemaic Astronomy," in E. Mendelsohn, ed., *Transformation and Tradition in the Sciences* (Cambridge: at the University Press, 1984) 133–53; Tzvi Langermann, "The True Perplexity of The *Guide of the Perplexed*: Part II, Chapter 24," in Joel Kraemer, ed., *Perspectives on Maimonides: Philosophical and Historical Studies* (Oxford: Oxford University Press, 1991), 159–74.

[84] *Guide* II 3.

[85] *Guide* II 11. Plato's likely story account of science is not, of course, a skeptical rejection of the scientific enterprise, but an attempt to explain the nature and limits of what must pass for knowledge within the confines of a temporal, sensory world. See Anne Ashbaugh, *Plato's Theory of Explanation* (Albany: SUNY Press, 1988). Maimonides too is no radical skeptic. He accepts Saadiah's epistemology, and his most distinctive principle of method is the postulate that the possibility of doubt is *not* sufficient grounds for rejecting a claim.

[86] *Guide*, II 2, 11. At II 8 Maimonides cites a passage now lost in Talmud texts, at *Pesahim* 94b, "The sages of the nations prevailed," to show that the Rabbis conceded the authority of secular science in astronomy and other natural sciences.

[87] *Guide* I 72, II 4–5. Averroes gives the same diffident approval of cosmic emanation that we find in Maimonides, bracketing such speculations as the work of "recent philosophers such as al-Fârâbî," perhaps along with the ideas of Themistius and Plato, yet calling them "the most solid" notions we have to go on in these rather unsolid areas. Madrid Escorial Hebrew manuscript G1–14, fol. 103b, etc. cited in Davidson, "Averroes on the Active Intellect," n. 40. Al-Fârâbî himself characteristically brackets metaphysical views which have an impact on cosmology as "beliefs of the people of the excellent state." See *Ara'*, and *Fuṣûl al-Madanî*.

[88] See *God of Abraham*, Chapter 8.

[89] See my "Ordinary and Extraordinary Language in Medieval Jewish and Islamic Philosophy."

[90] See the chapter on creativity in my *Truth* (forthcoming).

[91] See *De Partibus Animalium* I 5, esp. 645a 9.

[92] Cf. *De Partibus Animalium* I 1, 640b 30 ff.

[93] Here I refer to the profound insight articulated in Cynthia Ozick's story, "The Laughter of Akiva," in its original recension in the *New Yorker* 56 (November 10, 1980, et seq.), 50–60+.

MOSHE IDEL

DEUS SIVE NATURA – THE METAMORPHOSIS OF A DICTUM FROM MAIMONIDES TO SPINOZA

I

The relationship between the dissemination of Maimonidean thought and the emergence of Jewish mysticism still requires clarification in order to understand more fully some of the major processes in the religious and intellectual history of Judaism. In the period following the death of Maimonides, two main interpretations of Judaism surfaced exactly at the same time and competed with each other in a conspicuous way, each of them claiming to represent the correct interpretation of Judaism.[1] Though this competition is a crucial fact in the development of Jewish speculative literature, there is no doubt that the Kabbalists learned a lot not only from the halakhic *opus* of Maimonides, but also from his other works and indeed profited from a variety of themes treated by "the great eagle."[2] Here we are concerned only with the influence of Maimonides' view of nature on Kabbalah. We will be primarily concerned with tracing the developments within certain kabbalistic circles of Maimonides' understanding of the relationship between the natural and the divine.

However, before addressing our main theme, let me briefly comment on the reverberation of an interesting Maimonidean concept on Kabbalah: his view regarding the constant miracles. Cursorily presented in his *Treatise on Resurection*,[3] the conception of a natural order that conforms to the biblical requirements concerning human behaviour had a long and far reaching career in a series of Kabbalistic texts, starting with Nahmanides' writings.[4] Though similar views can be detected also in the writing of Jewish thinkers preceding Maimonides,[5] Nahmanides quotes him alone when elaborating on the view of hidden miracles. The basic assumption of the existence of an underlying process that is occult by definition and is therefore invisible to the contemplator of natural processes, struck a sensible chord in the Kabbalistic view of reality. However, far from becoming occasionalists, in the sense of the Mutakallimun,[6] the Kabbalists used Maimonides' view concerning hidden miracles in order to propose another level of processes which regulate nature. The biblical conception of the interrelation of human behaviour and natural processes did not satisfy the religious interest that dictates now the way of understanding the

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 87–110.
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function of the hidden miracles. Rather, for the Kabbalists, the supernal structure of the Sefirot, the source of the main changes in the terrestrial world, was affected by the performance or the lack of performance of the commandments, so that the regular way of the world is conceived to be a hidden miracle. This concept of the Kabbalists transformed what may be designated as an occasionalism of the divine will, into one that focuses mainly on the human will.[7] In other words, Kabbalah projected the natural order on a divine realm, superimposing the supernal sefirotic processes on the natural events, thereby transforming the Bible into the major source for the proper understanding of reality in both history and nature, at least as far as the people of Israel are concerned. The divine book became a clue for understanding the book of nature, a notion that ultimately entered the Renaissance thought through the intermediacy of Pico della Mirandola.[8] The various avatars of the Maimonidean view of constant miracles in Kabbalah is not our concern here. I nevertheless would like to point out that those Kabbalists who adopted the hidden miracle theory followed Maimonides only indirectly throught the intermediacy of Nahmanides. A common denominator of these Kabbalists is the fact that they belong to the theosophical-theurgical Kabbalah, namely the main trend in Catalonian and Castilian Kabbalah until the Expulsion, a fact that will be dealt with later in our presentation.

II

Several scholars have pointed out the possible affinity of the well-known phrase of Spinoza *Deus sive natura* with certain Jewish texts.[9] Some have also indicated that Jewish mystical sources were the source of Spinoza's idea specifically the gematria *Elohim* [God] and *Ha-Teva'* [Nature].[10] In contrast, S. Pines noted the possibility that Maimonides' formulation, including an implicit identity of the natural and divine acts could, at least partially, have influenced Spinoza.[11] These proposals seem to be, *prima facie*, exclusive of each other. Furthermore, it seems improbable that the philosopher had combined so utterly different types of sources. In the following pages, I shall attempt to trace the line of development from Maimonides to the Kabbalistic sources that may have been before the eyes of Spinoza. My major concern will be to combine the two abovementioned explanations by showing how Maimonides was understood by his Kabbalistic followers, in order to propose the first detailed description of the history of the gematria. *Elohim* equals *Ha-Teva'*. However, since so many sources existed, including some in print and available to Spinoza when he formulated his views, it is difficult to pinpoint one particular source alone which may have been the source of Spinoza's dictum. As we shall see, the equation of a certain divine name and nature was already a commonplace, a fact that strengthens the possibility of Jewish influence in general, but complicates the task of a scholar trying to establish the direct influence of one specific text on the philosopher.

Let me start with the ancient Jewish sources that contributed to the emergence of the equation of *Elohim* and nature.

It is an obvious fact that in the first chapter of Genesis, the sole divine name used in the creational process is the name *Elohim*. This peculiar fact did not escape the meticulous scrutiny of the Rabbis, who pointed out the consistent usage of this name in comparison to the total absence of the Tetragrammaton.[12] This initial chapter of the Pentateuch dealing with the account of creation, was regularly referred to as *Ma'aseh Bereshit*.[13] This term, an organic part of the esoteric nomenclature of Jewish mysticism, was reinterpreted by Maimonides as referring to Aristotelian physics, in Hebrew *Hokhmat Ha-Teva'*, the science of nature.[14] It seems reasonable to assume that the consistent occurence of *Elohim* in that part of the Bible which deals, according to Maimonides, with the science of nature, might have contributed to the understanding of the divine, i.e. *Elohi*, as tantamount to natural, *tivi'i*. I would like to emphasize that this possible mutation of meaning regarding *Elohim* or *Elohi* is not the only reason, nor may it even be the most important reason for the conceptual affinity between divine and natural. However, it seems implausible that Maimonides could have ignored this factor as one of his reasons for the equation *Elohi=Tivi'i*.

This implicit equation occurs in at least three instances in the *Guide*, in each case regarding different topics. In the *Guide* I:1, p. ii, human intellect is understood as that part in man that is the image of God, *Zelem Elohim*, which is considered to be a natural form.[14] If the term image, *Zelem* is an allegory for the intellect, or the form, then *Elohim* was probably conceived of by Maimonides as parallel to "natural." In another place, Maimonides wrote [*Guide*, I:66, p. 160]:

> "And the tables were the work of God [Ex. 32:16]. He intends to signify by this that this existence was natural and not artificial, for all natural things are called "the work of the Lord."

The Hebrew phrase *Ma'aseh Elohim* is interpreted as pointing to the natural existence of the tables. Finally, in the *Guide* III:32, p. 525 we read:

> If you consider the divine actions – I mean to say the natural the deity's will graciousness and wisdom, as shown in the creation of living beings, in the gradation of the motions of the limbs, and the proximity of some of the latter to others, will through them become clear to you."

It is in the context of this last quote that S. Pines notes that Spinoza's expression *Deus sive natura* "may have been, at least in part, suggested by this passage of the *Guide*."[15]

The three areas where Maimonides understood the divine activity as natural were the human intellect, the human *body, or the bodies* of any living being, and even mineral objects such as tables of stone. Accordingly, Maimonides considered both the spiritual and the corporeal levels of nature as possibly divine.

The Maimonidean understanding of the natural and the divine as two related

and overlapping categories was engendered by the penetration of the Greek notion of spirituality, in our case, the concept of God as the source of the forms that represent the spiritual dimension of any creature. By applying the notion of total spirituality to God, and by envisioning the spiritual element in the natural realm as coming from above, [In medieval Aristotelianism it was considered to stem from the Agent Intellect], the gap between the divine and the created was at least, in principle, bridged. Maimonides subscribed to the concept of the intermediary spiritual chain of the separate intellects that transmits the divine flow to the lower world, the last of these intellects functioning as the vicar of God in the mundane realm. Our emphasis on the affinity between the two realms, the divine and the natural, complicates the wellknown assumption of the Maimonidean theology regarding the uncomparability of God to any other being. This problem, which cannot be neglected, complicates the understanding of the topic divine-natural in Maimonides' thought. Neither is this quandary absent from the writings of some other thinkers to be mentioned below. Without wishing to minimalize this crucial question, I will nevertheless present the texts that seem to follow the path alluded to by the hints of "the great eagle." It seems that the ultimate conclusion regarding this quandary was drawn by Spinoza in rejecting the principle of emanation that was so important for the medievals, thus allowing a simpler relationship between the natural and the divine. This daring idea of Spinoza was not presented in a clear fashion by any of his Jewish predecessors, no matter how they formulated the gematria which links God and nature, to be surveyed below.

III. ABRAHAM ABULAFIA: ELOHIM AND HA-TEVA'

Among the thirteenth century Kabbalists, no one regarded himself more a Maimonidean than Abraham Abulafia.[16] An author of three commentaries on the *Guide*, and an errant scholar teaching the *Guide* and its secrets in Spain, Greece and Italy, he absorbed the metaphysics and psychology presented by Maimonides and superimposed on them his peculiar kind of Kabbalah, based on the ideal of attaining the prophetic state, i.e. ecstatic and revelatory experiences by combinations of letters. It is therefore no surprise to find in Abulafia's works the first known occurrence of the Gematria *Elohim* is numerically equal to the word *Teva'*, namely Nature. Already in his first extant work *Get Ha-Shemot*, this gematria is found.[17] Discussing those names that may change the order of nature, he describes them as "divine [*Elohim*] [and they] change nature, [since they] are the throne [*ha-Kisse'*] and this is the secret of [the verse[18]]. It is the Finger of God [*'Ezba' 'Elohim*], which is the attribute of judgement."[19]

The terms Nature, in Hebrew *Ha-Teva'*, and Throne, *Ha-Kisse'* are numerically equal, namely 86; therefore, it cannot be a matter of mere coincidence that in this context, the name *Elohim* occurs. It seems very reasonable to assume that it is related to the two terms in a numerical way since it also has the same numerical value, 86. Let us examine this text in a closer way. The entity that is

conceived as changing nature is the divine finger, which does it through the intermediacy of the divine name *Elohim*.

Prima facie Abulafia subscribes to the already existing view, as expressed for example by R. Abraham ibn Ezra that the divine names may change the course of nature.[20] Abulafia was aware that it may be understood, namely, misunderstood, in such a way. This is why he immediately warns that such an understanding is the lot of fools. The multitude is unable to understand the peculiar quality of the divine name, except from the miracles God may perform and no one can openly oppose this view of the vulgus. However, the most profound secret, Abulafia assigns to the *illuminati*, is that the miracles include both a manifest and a hidden dimension, namely a sensible and spiritual aspect.

No doubt, it is clear that the manifest dimension of the miracle, Abulafia mentions in this context the splitting of the Red Sea,[21] deals with the sensible change in the order of physical nature. However, what is the secret meaning of the power of the divine name? According to Abulafia,[22] the intellectual message inherent in the biblical story is more important and can be understood in his days by those who apprehend the truth even better than by those who witnessed the miracle themselves. The ultimate significance of the passage of the Red Sea is the passage from the sensible to the intellectual level, the latter being tantamount to the comprehension of God or His divine name.

On the basis of the above, changing nature may have two different connotations: the physical change, accomplished by the power of the name to disrupt the natural order, and the spiritual meaning, pointing to the force of the name to accomplish another change, leading from sensible apprehension to an intellectual one. In other words, the hidden significance of changing nature refers to the psychic transformation one undergoes, all this in connection with the divine name. This last link between name and inner change is especially crucial for the whole Kabbalah of Abulafia. Using the divine name, namely the letters forming the name, in his combinatory techniques, one is able to attain a profound transformation which may culminate in the achievement of prophecy. Therefore nature represents in Abulafia's as in Maimonides' thought, for both the corporeal as well as the spiritual levels of reality. He concisely formulates his conclusion in a later work, *Sefer Ha-Heshek*:[23] "The tables [of the Law] are a homonym for natural internal issues, since according to the AT BaSH device tables [LHT, according to the biblical spelling] are tantamount to *Kisse'* [throne] which is [in gematria] *Teva'* and for the external issues which are the tables of stones." Therefore, the tables stand for the inner, spiritual aspects of man. The tables of the heart, which are, according to Abulafia, the intellectual and imaginative faculties,[24] designated as nature, and for the external objects. Since the two key concepts referred to in the passage from *Sefer Get Ha-Shemot*, Nature and Throne, occur also in *Sefer Ha-Heshek*, it seems reasonable to apply the hononymity from one discussion to another, and articulate Abulafia's secret as pointing to inner, that is spiritual nature.

I have dealt with the meaning of the passage in *Get Ha-Shemot* since it seemingly includes the first significant relationship between Nature and the divine name *Elohim*, apparently based upon the numerical value of the two

words. Since the abovementioned book was written in 1271, it precedes the lengthy discussions occurring in R. Joseph Gikatilla's *Ginnat 'Egoz*, written in 1274, whose specific content and importance will be presented below. However, before turning to Gikatilla, let me complete my presentation of the rich material found in Abulafia's later works, which will reveal the transition from the Maimonidean views to Kabbalah.

In *Sefer Sitrei Torah*, one of Abulafia's three commentaries on the secrets of the *Guide*, he analyzes the various meanings of the word *Ma'aseh*, which may stand for account, work, deed or event.[25] Immediately afterwards he mentions the Tables, which "are also called *'Ma'aseh*, since they are natural [*tiv'iim*] similar to the other divine deeds." Following Maimonides' formulations in the *Guide* I:66, Abulafia envisions the tables as natural and divine at the same time. No wonder that on the next page of this work, Abulafia mentions, in the same statement the three concepts we have already encountered in such a manner that it is obvious that he sees a link between them: I shall quote the Hebrew version:[26]

"That *Elohim* has created: In [or on] the forms of nature, in [or on] the forms of the Throne." I have translated the verse in Genesis literally, with Elohim as subject. Nevertheless I doubt whether this is the way Abulafia intended it to be understood. Grammatically, the Hebrew sentence can be understood also in a different way: "That [It] created *Elohim*" namely positing *Elohim* as an object. I indeed prefer this reading, since it permits a very symmetrical reading of Abulafia's statement: "*Asher Bara'*" is numerically identical to "*Bezurot*" both phrases having the value of 704. Then, the remaining terms, *Elohim*, *Ha-Teva'*, *Ha-Kisse'* play the same syntactical role and likewise have the same numerical value. As some other Kabbalists, Abulafia also conceived *Elohim* as the object of the act of creation, not as its agent.[27] As such, this name indeed is tantamount for Abulafia with nature, and the gematria is not to be understood as a mere linguistic play, but a way to fortify the identity of the natural and divine proposed by Maimonides in the *Guide*. The fact that this passage is found in a commentary on the secrets of the *Guide*, commenting on Maimonides' statement on the Tables as natural, namely divine, shows that the Kabbalist elaborated upon the view of Maimonides, using his peculiar hermeneutical devices.

Abulafia mentions several times the homonymy of the name *Elohim*, as e.g. in *Sefer Ha-Heshek*:[28]

> The name *Elohim* comprises[29] [several meanings]: it is an appellative for the totality of the natural forces; it is part of the names of the First Cause, and it refers also to an attribute of Him, by which He, Glory to Him, is separated from other entities.

This conception of *Elohim* as the generic name of all the natural forces, is congenial within the understanding of this name as an object in the first verse of the Pentateuch. In the beginning, the natural order was created, and only afterwards the various divisions appeared. As such, Abulafia's view is close to

the Talmudic-Midrashic one which holds that God wanted to create the world with the attribute of Judgement, namely with the name of *Elohim*.[30] According to this kabbalist, Nature is connected to this divine name but also to the idea of limit; In a commentary on his own prophetic works, Abulafia presents together the following words:[31] "*Elohim, Hamevattel, Ha-Teva', Hamugbbal ... Galgal Yod ... Galgal Dio, Galgal 'Asiri.*" All these words have the numerical value of 86, apparently pointing to related or similarly functioning concepts. Here *Elohim* and Nature are understood as the spiritual sphere, which is the tenth sphere, but nevertheless as a limited entity. It seems that Abulafia considered the emergence of all the natural forces to be the result of the action, may be movements of the first sphere, in our text related as the tenth sphere,[32] according to a medieval view that envisioned all the movements in the terrestrial worlds as effects of movements in cosmic spheres.[33] Describing Nature as identical with the spiritual realm, Abulafia is manifestly coherent with his previously mentioned view in specifying the order of nature, rather than Nature itself.

We may summarize the two main directions of Abulafia's understanding of the meaning of the equation *Elohim=Teva'*: it stands for the inner, spiritual nature and for the external, hypostatic view of nature as well as the order of nature, i.e. a spiritual realm, created in the beginning, and regulating the natural processes, which are, thereby, considered also divine.

IV. R. JOSEPH GIKATILLA'S EARLY WRITINGS

In a short autobiographical passage, Abulafia mentions Gikatilla as one of his students to whom he taught the *Guide*.[34] This seemed to have happened in the early seventies of the 13th century, when Abulafia was wandering in Castile. Gikatilla's early work, *Ginnat 'Egoz*, a kabbalistic book related to Abulafia's peculiar type of Kabbalah, and even more to Abulafia's sources,[35] points to the affinity between *Elohim* and *Teva'*, God and Nature on several occasions.

Nowhere is this affinity expressed precisely as a gematria, as in the case of Abulafia, nor is this affinity directly connected with the Maimonidean view of natural and divine. Moreover, one main direction of Maimonides' and Abulafia's interpretation of the meaning of this affinity, the psychological one, seems to be totally absent in Gikatilla's works. The spiritual interest of this Castilian Kabbalist did not include the prophetic inclinations of his former teacher of the *Guide*, and he suppressed Abulafia's inner interpretation of the equation *Elohim=Ha-Teva'*. I see no reason to assume that Gikatilla arrived by himself at the same gematrical identity, though it is still possible that he, and Abulafia, used unknown common sources. However, until some solid evidence regarding the existence of such source will surface, I assume that Abulafia transmitted to his students his view on correct manner of reading the *Guide*, including our gematria.

What remained from this hypothetical transmission is only the hypostatical understanding of the relationship of Nature and *Elohim*, which Gikatilla elaborated in a detailed way, in some of his early writings. Let me discuss the

most important aspects of this conception.

Like Abulafia before him, Gikatilla used the same triple gematria of *Elohim*, *Ha-Teva'* and *Kisse'*:[36]

> The creation of the world is the act of nature, whose secret is *Elohim*, since nature is the nature of the throne ... Understand that the name *Elohim* emerged with the creation of nature whereas the Tetragrammaton did not emerge with the creation of the world, since it is [a name] unique to Him.

In line with Abulafia's interpretation of the name *Elohim* as the order of the creational processes, Gikatilla writes:[37]

> At the beginning [He] created *Elohim*, namely at the beginning of nature the throne was created, by means of the name *Elohim*, which emerged with the creation of [the world]. And it is written that *Elohim* created and not the Tetragrammaton created; see how the Tetragrammaton[38] is hidden in the creation, and the name which is an appellative for creation is the name *Elohim*, which is connected to nature, since by the intermediacy of it all the natures [i.e. essences] were impressed in the account of Creation.

The source of the natures, or the essences mentioned in the preceding quotation is the Tetragrammaton, which is understood by Gikatilla as the generator of essences, but not as the proximate creator of the world. Nevertheless, in the same work, this Kabbalist refers to the highest divine aspect using the following phrase "He impresses all the natures [i.e. essences] with a lasting nature." It is obvious that this lasting character of the divine activity is considered by Gikatilla as the reason for the denotation of Nature applied to the divine activity in the creational process. Therefore, the generation of the essences is indeed attributed to God, but the impressing of these essences, the natures as the Kabbalist calls them, is regarded as the prerogative of that divine aspect named *Elohim* or Nature. Gikatilla specifies that the name *Elohim* expresses the idea of force,[39] wihch becomes manifest in the lasting character of the natures impressed in matter, in the creational process. Therefore, Nature is that denomination attributed to God by virtue of the impregnation of essences in the act of creation. This name occurs together with the phrase "impresses natures" a fact that will be elaborated below.[40]

In the same period when Gikatilla wrote his *Ginnat Egoz* he also composed a commentary on the first chapter of Genesis. There we also find a certain distinction between a highest essence of God and one referred to as *Elohim* and Nature:[41]

> Know that every nature bears the seal[42] of the King, and there is no real existence to any nature except by the existence of *'Anokhi*. However, the secret of *'Anokhi* is different from the secret of *Teva'* since the category[43] of *'Anokhi* is that of *'A*[leph] whereas that of *Teva'* is *B*[et] in order to hint that *'Anokhi* is [equivalent to] *Yesod A* but *Teva'* is *Biniyan B*[44] ... And do not

> argue from either the secret of *Kisse'*[45] or from the secret of *Elohim*, since the issue of *Elohim* is different from them, since every *Kisse'* testifies that there is *Yesod A* and likewise every Nature and every *Elohim*.

The difference between the *'Anokhi* and *Teva'* seems to be of another type than that between the Tetragrammaton and the name *Elohim* in *Ginnat Egoz*. The Tetragrammaton stands for the divine Being when standing in Himself, *Elohim* for the divine action in the process of creation. In the last quotation, the appellative *Elohim* stands for an entity that is separated from God in a distinct way; it is to be identified with the separate intellects, as they are conceived as identical with the *Binyian*,[46] the structure mentioned in our quotation. Therefore, it seems that in this case, Gikatilla, like his master Abulafia, assumed that the hypostatical status of nature was identical with *Elohim*.

It should be mentioned that the previous views concerning the relationship between *Elohim* and Nature occur in different theological contexts, in texts influenced by Gikatilla, written under the overt impact of *Ginnat Egoz*. There, *Elohim* is understood as the first created thing, identified also as Nature, a stand identical with that expressed in his commentary on the first chapter of Genesis. To a certain extent, this status of the entity designated as *Elohim* is reminiscent also of the view of Abulafia mentioned above, where *Elohim* occurring in the first verse of the Pentateuch is regarded as the object, rather than the subject of the verse.

The hypostatic state of Nature as a separate entity became obvious in an anonymous Kabbalistic treatise *Eshkol Ha-Kofer*, written under the impact of Gikatilla. There we read in the context of the phrase "the sea of wisdom" as follows:[47]

> All the rivers run to the sea,[48] because the vitality of all creatures comes from Him, and returns to Him. The secret of *Elohim* points to nature in the account of creation and in the book of Ecclesiastes it is demonstrated in the verse "and the sea is not full, since its existence depends upon the other, namely on the name of God, Blessed be He ... and the secret of the sea is *Shi'ur Qomah*[49] and whoever understands the secret of [the verse] all the rivers run to the sea he will understand why the name *Elohim* is comprised of nature.

The anonymous Kabbalist identifies nature and *Elohim* with the supernal sea and the divine anthropomorphic structure, *Shi'ur Qomah*, as well as the First Created Entity, the divine glory, the divine throne and the world of the intellect.[50] Part of the previous list of attributes is congenial with an hypostatical understanding of *Elohim* in a commentary on the *Guide*, probably authored by Gikatilla himself.[51] However, in this commentary, the hypostatical conception of nature does not occur.

Also, stemming from the circle of Gikatilla, possibly being part of one this kabbalist's works, is a passage found in R. Meir Aldabi's work *Shevilei Emunah*;[52] Here the name *Elohim* is understood as formed from two linguistic

elements: *Elem* and *Yah*,[53] the meaning of which is that this name represents a collection of natures, since, as this author explicitly states, *Elohim* is numerically equivalent to *Ha-Teva'*.

Ginnat Egoz was an influential Kabbalistic text. The occurrence of an identity between the divine name and nature in such a text contributed to the diffusion of this view. I would like to mention here only some of the interesting instances of the recurrence of this gematria.

In R. Bahya ben Asher's classical *Commentary on the Pentateuch*,[54] he paraphrases the view of Gikatilla in an anonymous way; what is however interesting in this usage is the way Gikatilla's view is introduced; it is adduced as the plain meaning of a verse, *'al-derekh hapeshat*, not as a Kabbalistic interpretation!

Another major Kabbalistic book, R. Moses Cordovero's *Pardes Rimmonim* also resorts to this gematria.[55] It seems that this Kabbalist combines the stand of Gikatilla as expressed in *Ginnat Egoz*, with that of the same author in his later work, *Sha'arei Orah*.[56] The divine name *Elohim* is directly related to the attribute of strict justice, while the identity of nature with this attribute is presented as pointing to the account of creation. The attribute of Grace is understood as the divine force maintaining creation, and at the same time, the source of the miracles that change the course of nature. Again, in another of Cordovero's works, the magical attempt to break the course of nature is regarded as annoying the divine attribute designated as *Elohim*, by pressing it to change its regular course.

Under the apparent influence of Cordovero, R. Eliah de Vidas, in his *Reshit Hokhmah*, wrote that the righteous are capable to change the course of nature, and that the attribute of grace can change the course of nature.[58]

V. REVERBERATIONS OF ELOHIM=HA-TEVA' IN PHILOSOPHICAL SOURCES

From the previous discussions, it seems reasonable to assume that the emergence of the gematria is the result of the Kabbalistical interpretation of a philosophical position. Already by the end of the 13th century, a Kabbalist attributed the gematria to Kabbalists in plural, an interesting testimony regarding the dissemination of this gematria.[59] Indeed, the Kabbalistic formulation penetrated also non-Kabbalistic writings, a fact that demonstrates that the speculative dimension of this relationship was congenial as well to other types of sources.

In the commentary on the secrets alluded to in R. Abraham ibn Ezra's commentary to the Pentateuch, wrongly attributed to R. Joseph Caspi, we find a highly interesting passage on our topic. The anonymous author indicates that:[60]

> All the sages have written a work named Gematria [sic] and they counted that [the word] *Elohim* has the value of *Ha-Teva'*, and the philosophers found that they [sic] called the human intellect [by the name] natural form. In such a manner Rabbi [Maimonides] commented – in his important book, when

> commenting on *Zelem* and *Demut*, in the first part – [when dealing with the verse] *Bezalmenu bidemutenu*, [In our image, in our likeness] [that is] the natural form, since it maintains the essence of the body, by whom it receives its essence ... and the degree of *Ishim*[61] is called by this name since it speaks with men, and it appears as men. Also it is said that it is called [by the name of] *Elohim*, because it flows onto the human intellect that is called Nature, since it is in him and it maintains him.

This passage includes several important ideas to be considered more closely. Firstly, the anonymous author recognizes that the source of the gematria is a book written by "all the sages." At the same time he argues that this identity is to be understood in its psychological dimension, already apparent in Abraham Abulafia's works, as understood from the *Guide*. Again, using another work of Maimonides, he interprets the generic name *Elohim* when applied to a class of angels, as the source of the influx that reaches the human intellect, referred again as Nature. Possibly, the passage includes an allusion to the identify of the essence of the human and the Agent Intellect, conspicuously referred to as *Elohim* and *Ishim*.

According to the beginning of the passage, the gematria appeared in a work, itself named Gematria. I am not aware of the occurrence of this numerical identity in a work having this name. However, the assessment that "all the sages" wrote this work may point to a certain unanimity as far as this gematria is concerned.

Who exactly those sages may be is not clear at all. However, it seems that one may at least locate formulations that include implicit affinity between nature and the name *Elohim*. Take for example, R. Isaac Albalag, a late 13th and early 14th century philosopher, who describes the "world of nature as the special place for the rule of the powers of the spheres, called *Elohim*." This is the reason why this world of nature is also called "the house of God" [*Beit Elohim*].[62] A comparison of the biblical phrase "house of God" with the philosophical expression "the world of nature" leads to the conclusion that house is parallel to world, and nature to *Elohim*.

More conspicuous is the view of a late 14th and early 15th century North African Jewish author, R. Yehudah Carasani. In his *Aron Ha-'Edut* he maintains that:[63]

> The angels are called *Elohim* ... and behold *Elohim* in gematria is *Ha-Teva'*, since it is called angel, and the angels are called *Elohim* ... since the act of God on the earth is by the angels called *Elohim* and they are the first chariot.

As in the case of Albalag, Carasani also applies the name *Elohim* to the angelic powers which constitute the divine activity in the terrestrial zone.

In the middle of the 15th century, an anonymous author, probably in Italy wrote, under the cumulative influence of Maimonides[64] and Abulafia as follows:[65]

> Whatever existence comes during the seventh day [of creation]
> is a natural one and this is alluded in the verse[67]
> that *Elohim* created in order to make, namely that *Elohim* created
> them in order to make from then onward, since on the sixth day
> he accomplished
> his entire work, Blessed be He, and the secret of *Elohim* is *Ha-Teva'*
> as if it were said that Nature created from then onward.

This is the first time, as far as I know, that someone not only uses the gematria implying that God is equivalent to nature, but also places nature in a biblical verse in lieu of the divine name. The same author overtly posits nature as another term for the divine will, both of them being interchangeable.[68]

A synthesis between a view of Ibn Ezra, that of Maimonides and of the gematria we have been dealing with here, is found in R. Abraham ibn Migash's *Kevod Elohim*. According to this 16th century thinker:[69]

> "It is the finger of God" namely a natural issue, determined by the constellation ... and it is written that the tables are the work of God ... since everything done in the seven days of creation is said to have been made by the finger of God [*Elohim*] ... and *Elohim* in gematria is *Ha-Teva'*.

Last but not least; R. Yehudah Moscato, a famous Italian preacher in the second part of the 16th century openly refers to God in these terms:[70]

> He, Blessed be He, is called Nature truly ... since He is impressing all the natures of the creatures with His signet.

Though the gematria is absent here, we can easily see that the description of God as Naturator, combines both the Mishnaic simile, [to be discussed below] of God as impressing His creatures, in the original *Tovea'*, with his description of real nature.

Before leaving the survey of the most important discussions of the gematria *Elohim=Ha-Teva'* in the pre-Spinozian period, I would like to mention the fact that a long series of Hasidic passages deal with this gematria. The Hasidic material is much more rich than all the preHasidic evidence treated above. However, the essence of the Hasidic discussion represents a combination of the theosophical-theurgical occasionalism together with the pantheistic trends implicit in the philosophical texts and in the philosophical Kabbalah dealt with above. An analysis of the Hasidic understanding of the gematria is fascinating in itself and requires a special treatment that will take into account the spinozistic development as well. Here I shall mention only one important Hasidic passage, that points to an earlier, albeit still unlocated view, regarding the connection between the gematria and the notion of contraction, *Zimzum*. According to an early Hasidic tradition:[71]

> God, the Lord of the Hosts, is as a sun and a shield[72] ... just as it is impossible to contemplate the sun, out of greatness of the brightness of its light, except by using a shield and a separating veil ... so also is the case the Tetragrammaton, whose light is bright and thus needs a contraction and limitation into the name *Elohim*, in gematria *Ha-Teva'*, which is as a shield.

Now, the idea that the name *Elohim* is a shield for the Tetragrammaton occurs also in the classical kabbalistic sources.[73] The view that the infinite light has to be limited as part of the process of comprehension, and as a part of the creational process is also a classical Kabbalistic conception, from the time of R. Isaac Luria.[74] What however, seems to be of special interest in the Hasidic passage, is the fact that nature is presented as a contraction of the divine infinite. It is the divine in a contracted form. The opposition between natural versus divine is transcended here by positing a contraction as the explanation of the passage between the two divine modes of existence. This occurrence of the notions Nature, *Elohim* and contraction together, may therefore point to a conception parallel to Spinoza's understanding of *natura naturata* as the limited mode of God as nature. Indeed, it one could locate a pre-Spinozistic source that would combine the gematria *Elohim=Ha-Teva'* with the Kabbalistic contraction, it would be an amazing antecedent for understanding nature as a limited aspect of God. However, for the time being, such a view cannot be located before the middle of the 18th century. Nevertheless, such a combination is possible, and in fact the gematria which appears in Abulafia, *Elohim=-Ha-Teva'=Hamugbbal* namely the finite[75] seems to hint at the probability that such a vision of nature as a limited mode of the divine was possible. In any case Abulafia uses exactly the same verb as the Hasidic passage does, *GBL*, in order to convey the idea of limitation.

It should also be remarked that since the writings of R. Azriel of Gerone, the term *'Olam Mutba'* the natured World, recurs in Kabbalistic works symbolising the last sefirah or configuration of the lower sefirot.[76] Such an appellative for a divine realm is indeed interesting in the context of a discussion of the possibility that a Kabbalistic concept of nature as a limited divine aspect was in existence sometime before Spinoza.

The previous examples are conclusive evidence for the usages of the gematria not only by Kabbalists but also by some authors who might have been influenced by Kabbalah without being Kabbalists themselves.

What seems to be the common denominator of most of the preceding authors, is the fact that they subscribed, when using the gematria, to philosophical types of theologies. This point seems to me to be of certain importance. A perusal of the classical Kabbalistic literature written by Kabbalists belonging to the theosophical-theurgical Kabbalah, demonstrates that this type of mysticism is reticent towards gematria in general and towards the specific gematria on God and nature in particular. So, for example, this gematria is absent in the voluminous classic of Spanish kabbalah, the book of the Zohar. Even more illuminating is the total absence of the gematria in the later works of R. Joseph Gikatilla. As soon as his Kabbalah turned into a

theosophy, as in his *Sefer Sha'arei Zedek* and *Sha'arei 'Orah*, he stopped pointing out the affinity between God and nature, even in contexts where such a statement was natural in the light of his earlier theological stand.[77] This change, together with the absence of this device in the theosophical writings of R. Moses de Leon and R. Joseph of Hamadan, are clear symptoms of an aversion toward the identification of God or even of one of his attributes, with nature.

It seems that this conclusion is generally correct as far as the second important body of theosophical literature is concerned, the Lurianic Kabbalah. The division between the two major types of Kabbalistic thinking, regarding the usage of the affinity or sometimes similarity between God and nature, reflect, in my opinion, the basic attitudes of those two types of Kabbalah to Maimonides in general. Like Maimonides, and ostensibly under his influence, Abulafia, the early Gikatilla, and the philosophically oriented authors mentioned above, prefer spiritualistic theology which emphasizes the simplicity of God, as against theosophical thought based on the fundamental assumption that the divine also comprises a multitude of divine manifestations named *sefirot*. The latter was conceived, as we have already mentioned at the beginning of our essay, as the super-nature which is, at the same time, the object of Kabbalistic study, of mystical experience, and of ritual.

However, beyond the different approaches of the theosophical versus the more philosophical Kabbalah to the gematria, it seems that in the two cases the final result, as far as the actual attitude of Kabbalists to nature itself is concerned, is not so great. According to Maimonides himself, nature was an important avenue, and according to S. Pines' view,[78] the single way open to the apprehension of the reality of the divine. Therefore, actual interest in natural phenomena was a religious requirement, almost an obligation. The study of nature was fraught with religious dimensions, and turned into an indispensable domain of speculation. Indeed, Maimonides was well acquainted with some sciences, a fact that was certainly in line with his vision of the natural as divine actions.

The Kabbalists, on the other hand were not interested in nature as an actual domain of contemplation. The theosophists among them envisaged the sefirotic realm as more dignified than the material, natural one. Their occasionalistic proclivities prevented them from being preoccupied by events that were considered to be accidents. Rather they were concerned with the proper knowledge of the supernal divine manifestations and the way to influence them by intentional Kabbalistic performance of the commandments. On the other hand, those Kabbalists who were interested in the ideas of Maimonides, as Abulafia and Gikatilla were, succumbed to a certain kind of speculation that brought them to abandon the practical interest in nature itself. Their universe was primarily a linguistic realm and understanding the numerical relationship between the various divine names and philosophical concepts was considered to be a higher preoccupation than the actual science of nature itself. The laws that rule nature could, according to these Kabbalists, be deduced in an easier way by applying the device of *gematria*, *notaricon* or *temurah* to the canonic

texts than to study the alien sciences.[79] Indeed, Abulafia summarized this situation when distinguishing between the logic of Aristotle and the inner logic of Kabbalah.[80] The former is appropriate to the natural realm, the latter to the theological one, which can be extrapolated from the Bible by using the combination of letters that characterized his Kabbalah. In other words, two types of super-natural orders were considered by Kabbalists to surpass that of nature, the sefirotic and the linguistic one, provided that they were in the possession of the clues to these types of mystical universes. Accordingly their interest in nature was reduced to the minimum. Precisely because of their conception that nature represents a divine kind of activity, the Kabbalists attempted to deepen their understanding of this divine facet, neglecting nature as a possible focus of study or contemplation. Instead, they concentrated their spiritual efforts on speculations regarding the components of the cosmos, the divine letters according to *Sefer Yezirah*, or with those archetypes that govern it, the *sefirot*.

We may describe Spinoza's place in the line of the discussions of the relationship between God and nature as a thinker who disentangled the importance of the linguistic proof, the gematria, and allowed the discussion of this relationship a place in itself, separated from demonstration from biblical sources or from mystical hermeneutics based on the unique qualities of the Hebrew language.[77]

I would like to address now the question of Giordano Bruno's influence on Spinoza. Indeed the Nolan thinker also posited a pantheistic understanding of the relationship between God and Nature. From the chronological point of view it is not difficult to see in Bruno a possible source of Spinoza and I do not question this possibility at all. However, as I have attempted to show elsewhere,[81] it is quite possible that Bruno was influenced both directly and indirectly by Jewish sources when dealing with topics concerning the relationship of God and nature. If indeed Spinoza was aware of Bruno's views, the existence of certain ideas in Jewish sources could only facilitate the appropriation of certain aspects of this thinking.

It might also be relevant to compare the Kabbalistic conception of the identity of God and nature with the Christian medieval view of nature as Goddess.[82] What strikes me in the perusal of the Jewish texts is the total absence of any personification of nature. In contrast to the rich Christian presentation of Nature as a hypostatic entity, having the attributes of a person, the Jewish sources are rather reticent to indulge in such a manner of discourse when dealing with nature. This absence is, however, not the result of the rejection of hypostatic conceptions or the fear of personification. Such types of thought and writing are rather common in Kabbalah. However, the peculiar distribution of interest in nature in the various Kabbalistic types of literature is the main reason for this absence. The philosophically oriented Kabbalah, which indeed adopted the identification of *Elohim*-Nature, rejected the mythical way of thinking in favor of a much more abstract presentation, and at the same time a static conception of the orderliness of nature. On the other hand, the theosophical-theurgical Kabbalah, which encourage symbolic and hypo-

static thought emphasizing a dynamic vision of reality, ignored the identification that could be transformed into a type of thought similar to the Christian concept of Nature as Goddess.

VI

Because the gematria *Elohim=Ha-Teva'* occurs in so many texts, it is difficult to locate one specific source for Spinoza's identification of *Deus* and *natura*. However, in order to attempt to identify such a probable source it would be worthwhile to follow the history of a pair of concepts in existence long before Spinoza but recurrent in his works. I refer to the terms *Natura naturans* and *natura naturata*. As scholars have already pointed out, these terms recur in the scholastic literature and it is reasonable to assume that indeed the 13th century authors using these terms could have influenced Spinoza. However, the origin, or origins of these terms are obscure and the attempts to explain the emergence of these terms from the translation of Averroistic sources from Arabic to Latin are, in my opinion, far-fetched.[83] I would like to trace another development for these terms, basing my proposal on the same line of argumentation I have followed in the previous discussion.

In classical Latin, the noun *Natura* did not produce a derivative verb. *Naturare*, as the possible infinitive form for *Naturans* or *naturata* is unknown before the end of the 12th century, if one accepts the arguments of the scholars. Only at the beginning of the 13th century the form *natura naturata* appears in a translation from Averroes' commentary to Aristotle's *De Caelo*. On the basis of this fact, Henry A. Lucks concluded that the Latin translations of Averroes are to be considered as the source of the scholastic terms.[84] Though the evidence adduced by this scholar is indeed interesting for the emergence of the scholastic terminology, the question of the origin of the concepts and the language developments that preceded the scholastic usage is still an open issue. P.Kraus has already proposed that the Arab forms *Tab'* and *Matbu'* are the predecessors of the later *natura naturans* and *natura naturata*.[85] These terms occur already in the writings of Jabir ibn Hayyan, the famous Gaber of the Latin medieval literature. However, it would, however, be pertinent to remark that the scholastic terms are composite ones, whereas the Arab ones are simple, a fact that complicates the explanation proposed by Kraus. However, the Hebrew noun *Teva'*, derived from the verb *TB'*, also has produced various verbal and adjectival forms before the 13th century. Moreover, late 12th and middle 13th century Hebrew texts already use expressions very similar and in some instances identical to the Latin *Natura naturans* and *natura naturata*. In light of this fact, which will be elucidated immediately, the possibility of an influence of the Jewish sources on scholasticism should be examined in detail, as a complementary source of influence, parallel to the Muslim philosophy, and as a probable avenue of the penetration of this type of nomenclature. This matter cannot be settled here. No doubt, the possibility that those sources which influenced Latin scholasticism might have influenced Spinoza, is still an open one.

It seems that the usage of terms parallel to *Natura naturans* and *natura naturata* was used already by one of the first Jewish philosophers, R. Sa'adiyah Gaon; in his Arabic *Commentary on Sefer Yezirah*, *The Book of Creation*, he wrote on the Creator that "He impressed each of the elements by a nature that is inherent to it," and in another place he mentions the elements that were impressed by natures.[86] The Hebrew translation of this text, accomplished, so it seems, in the 12th century, done by a certain R. Moses ben Josef, renders the crucial terms by the phrases *Tava' Tive'o* and *Tube'a*.[87] That is to say that both the active and the passive usages of the verb *TB'* were in usage when indicating the impressing of the essence of a certain thing in matter. In precisely the same context, the same roots used by Maimonides, in his *Code*;[88] when dealing with the natural tendency of the four elements to return to their natural places, Maimonides writes

> Their trajectory is not according to their thought or will, but a custom that was impressed in them, and a nature which was impressed upon them.

The Hebrew phrase, translated as "a nature which was impressed in them" reads: *"ve-Teva' shenitba' bahem."* Here we find the noun *Teva'*, together with a verb derived from the same root, both forms of rendering the act of impressing of a peculiar form on matter which thereby becomes the peculiar element.

However, the usage of the verb *TB'* in order to convey an act of creation is, as we have seen, not new with Maimonides; he, and apparently also R. Solomon ibn Gabirol already had used a similar form in a creational context. In one of his poems ibn Gabirol wrote:[89]

> He [God] impressed [*Tava'*] six extremes [i.e. dimensions], sealed by His [divine] name.

The six extremes, *qezawwot*, are connected to the creation of the world in the source of Ibn Gabirol, *Sefer Yezirah*, the ancient Jewish *Book of Creation*. Composed in the middle of the 11th century, the quoted line testifies to the usage of the verb *TB'* in order to convey the concept of creation; it is reasonable to assume that the *Commentary on Sefer Yezirah* of R. Sa'adiah was one source for the peculiar creational usage of this verb.[90] A contemporary of Ibn Gabirol, the poet R. Benjamin ben Shemuel, used the same verb in connection to creation:[91]

> The nature of the finest of dust, arose in His thought
> He mingled blood and water together and He embellished his form
> And before He breathed in him a breath, his image was impressed as a golem

The precise meaning of these lines is not clear. Indeed the occurence of the form *Teva'* already in the 11th century is rather exceptional, as is the form *hubta'* – impressed. However, we cannot doubt the fact that the passive form of

the verb *TB'* is not a late misunderstanding, since already in the middle of the 13th century, the Latin translation of these verses was made on the basis of the version which included the form *mutba'* that was correctly translated as "*erat impressa*."[92]

In the philosophical language of the translators from the Tibbonian family, both the active and the passive forms of the verb occur in connection with the formation of a certain thing. So, for example, R. Yehudah ibn Tibbon translates a sentence of R. Bahya ibn Pakuda:[93]

> God has already impressed in its nature love and kindness.

R. Shemuel ibn Tibbon, the son of the former translator, renders a sentence of Maimonides, from his *Guide*, as follows:[94]

> When God, Blessed be He, created the reality and impressed on it these natures.

Thus, it was a part of the Hebrew philosophical terminology to express the impression of a certain quality or the nature of a thing using the various forms of the verb *TB'*, sometimes attributing this action to God directly. Maimonides indeed is not innovative when using the verb *TB'*. His formulation in the *Code* is not clear enough. He did not mention who exactly is the subject of his sentence, namely the agent that impressed the nature of the elements. According to his cosmology, it is reasonable to assume that it is the Agent Intellect, which is the source of all the forms and the factor that changes the forms.

Before proceeding with our discussion of the impressing or stamping of nature or natures, when using the Hebrew very *TB'*, it is pertinent to adduce here the Rabbinic simile of God as stamping all men with the signet which, in a wondrous way, produces another sample every time. According to the Mishah:[95]

> A man could impress one hundred stamps with a single signet and all would be identical. God, the King of Kings, the Holy One Blessed by He, stamps every man with Adam's signet. Yet no one resembles another.

The signet and the verb translated as stamp, impress, are derived from the root *TV'*; the relationship of this type of metaphor to the medieval discussions of nature as a divine act was duly emphasized by J. Faur, who elaborated on the affinity between the ancient views, including Philo, and the medieval usage, in Maimonides, and later on in the controversy that arose around the speech of David Nieto.[96] However interesting his remarks may be, they do not deal with the emergence of the phrases *natura naturata* or *natura naturans* nor with the Kabbalistic material that serves, as we shall try to demonstrate below, as a possible link between Maimonides and the later usages, especially that of Spinoza. What seems to be important in the mishnaic statement quoted above is the fact that God is referred to using the root *TB'* in order to describe His

activity. Assuming that the ancient simile was very influential, it is easy to understand why the medieval authors had no problem in applying the very *TB'* to divine activity. It is obvious that there is a conspicuous semantic shift in the meaning of this verb. According to the philosophical usage of the verb, it refers to the creative process in general and not only with that of human nature. Furthermore, it refers now to the essence of the created entity, the form of the creatures in the Aristotelian understanding of the term, rather than the outer resemblance, as in the mishnaic passage.

The usage of the very *TB'* in a passive form, when referring to the formation of a certain entity, is found in one of Abraham Abulafia's commentaries to the secrets of the *Guide*. This Kabbalist asserts that the forms of all entities are determined by the divine name impressed on them. Ostensively, there is a close affinity between the impression of the name and the essence of the entities. As we have already seen in the citation from Ibn Gabirol's poem, and as we shall see in Gikatilla's presentation of this topic, that the divine names are impressing their natures on things. In one of his earliest works, *Maftean Ha-Reayion* Abulafia uses the phrase *Shem mutba'*, the name that is impressed in the mind, namely an intelligible issue.[97]

R. Joseph Gikatilla was much more interested in these phrases. In the same work, where he posits the divine appellative *Elohim* as tantamount to Nature, he uses the Hebrew phrases several times which are the precise counterparts of the scholastic terms. So, for example, he writes:[98]

> The appellative Elohim, which points to the innovation of nature since He, blessed be He, acted all the features, [and] He impressed all the natures, and He extracted them from the essence of his name.

God is referred as impressing all the natures, in Hebrew "*Shehitbi' a kol hatevaim*." As the Kabbalist indicates, these natures stem from the divine name, a statement that can reasonably be understood as implying that nature is inherent in the divine essence. Though the appellative *Elohim* is applied to God only in connection to creation, the very existence of the natures in the midst of the divine seems to be evident to Gikatilla.

What is characteristic of the impressing act of the Divinity in the creational process is that it has a lasting effect. So, for example, we learn from another discussion of the same Kabbalist:[99]

> Every nature is lasting, remaining in the same position, since it is impressed by the name *Elohim*, which signifies power, strength and existence.

Gikatilla uses the passive form to indicate the divine activity. The nature is impressed, in Hebrew, "*Beheioto mutba' bashem Elohim*." Two words before the form "*Mutba'*" the term *teba'* is mentioned. Here, as in other instances, it is obvious that the adjective "impressed" is connected to nature or, more precisely, natures. So, for example, we learn in another passage, that "these natures are impressed by the name *Elohim*, they [stem] from the Tetragramma-

ton."[100] Again, the inmost aspect of the Deity is presented as the ultimate source of the natures that are impressed by *Elohim*. The way Gikatilla employs the terms *Teva'*, *matbia'*, *teva'im*, *tava'im mutba'im*, as describing the divine activity in the processes of creation, ostensibly provides a clear distinction between the primordial aspect of God, designated by the Tetragrammaton, which is the origin of all the forms and natures that are impressed later on in the act of creation and another divine aspect, designated as *Elohim*, which is explicitly connected with creation and the emergence of nature. It seems reasonable to assume that the active usage of the verb *TB'* as well as its passive form, are attributed to the acts of *Elohim*; on the other hand, the active form of this verb seems to be in usage only as far as the Tetragrammaton is involved. It is noteworthy that the discussions of Gikatilla in *Ginnat egoz* which use the terms hitbia' and hutba' are more numerous than what was quoted here, and in fact, they are apparently the largest elaboration on the issue of creation employing these terms in Hebrew literature.[101]

I should like to indicate that the phrases, *Teva' matbia'* and *Teva' mutba'*, or very close variations of them, recur in Jewish Kabbalistic as well as philosophical texts from the end of the 13th century to the time of Spinoza. They appear, for example, in the writings of R. Yehudah Carasani,[102] R. Shem Tov ibn Shaprut,[103] and R. Isaac Abrabanel.[104] It seems that we may conclude that the scholastic terminology of *natura naturans* and *natura naturata* were not the source of Jewish writers as the usage of the authors quoted above testifies. If so, then the scholastic origin of Spinoza's usage of the terms is not self-evident, as the presentation of H.A. Wolfson lets us believe.[105] The problem indeed becomes much more complex if we also introduce the Hebrew material, which may have served as a reasonable source for both scholasticism and Spinozism. As a common source, the Jewish terms were both close enough and equally available to Spinoza.

Moreover, in the Kabbalistic sources, there is at least one element, crucial for the thought of Spinoza, which seems to be absent from the Christian texts. In the scholastic sources, *natura naturata* is identical with the natural, created, and limited realm that has nothing divine in it. As such it is overtly different from Spinoza's understanding of *natura naturata*, that implies a divine, albeit a limited, dimension. According to the Kabbalistic texts, especially Gikatilla's *Ginnat Eqoz*, nature is referred to as identical with *Elohim*. Though this identification is less overt as in the works of Spinoza, it is at least implicit in the formulations used by Gikatilla. As a starting point, they may serve as a reasonable source for the development that culminated with Spinoza's articulated thought about God as both *natura naturans* and *natura naturata*.

Let me address now the historical question: though Maimonides' phrases were apparently available to Spinoza, they are much more the nature of hints than clear formulations. On the other hand, in *Ginnat Eqoz*, the terminology is not only closer to the 17th century philosopher: in these sources, the relationship between *Elohim* and nature is expressed in an unequivocal way. Abulafia's works, preserved in manuscripts alone were hardly available to the 17th century philosopher. However, in the case of Gikatilla, the situation is

drastically different. His book was considered as a classic of Kabbalah and was printed at Hanau in 1615. Thus it was, so I assume, easily accessible in the next generation for those who had any interest in Kabbalah in Western Europe. Though we have no hard evidence for the acquaintance of Spinoza with this Kabbalistic work of Gikatilla, I assume that the chances are good that Spinoza studied Gikatilla's work.[106] If this is the case our hypothesis may open the way for a more detailed and positive reevaluation of the influence of Kabbalah on Spinoza, referring this time to concepts that are crucial for the philosophy of this author.

Interestingly, the only author that adumbrated our conclusion was H.A. Lucks, who noted the discrepancies between the Spinozistic usages of the terms *Natura naturans* and *natura naturata* and their meaning in the scholastic tradition. Therefore, he assumed, without proposing any precise source for his hypothesis, that Spinoza's sources for his peculiar understanding of these terms may be the same as the sources of the scholastic nomenclature, sources that he surmises to be in the Judeo-Arabic tradition. However, the description of these possible sources as "Jewish scholasticism"[107] needs to be modified, allowing for the important role of the mystical understanding of philosophy.[108]

ACKNOWLEDGEMENTS

Thanks are due to Professor Shlomo Pines and Dr Tzvi Langermann of the Hebrew University for discussing with me issues related to this article, and to Professor David Ruderman of Yale University who was very helpful rendering the first draft of the paper into a readable English.

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NOTES

1 See Idel, "Maimonides and Kabbalah".

2 This is especially true in the case of ecstatic kabbalah, a fact that is proven also by the following discussions.

3 Ed. J. Finkel, New York, 1939, pp. 33–39, par., 48–50.

4 See D. Berger, "Miracles and Natural Order in Nahmanides," in ed. I. Twersky, *Rabbi Moses Nahmanides [Rambani]: Explorations in His Religious and Literary Virtuosity*, Cambridge, Mass., 1983, pp. 106–128, and G. Scholem, *Les Origines de la Kabbale*, Paris, 1966, pp. 477–478.

5 Like R. Bahya Ibn Pakuda, *Hovot Ha-Levavot*, Gate II, Ch. 4.

6 H.A. Wolfson, *Repercussions of the Kalam in Jewish Philosophy*, Cambridge, Mass., 1979, pp. 171–99.

7 See M. Idel, *Kabbalah – New Perspectives*, New Haven, 1989, Ch. VII–VIII.

8 Cf. M. Idel, "The Magical and Neoplatonic Interpretations of the Kabbalah in the Renaissance" in ed. B. Cooperman, *Jewish Thought in the Sixteenth Century*, Cambridge, Mass., 1983, pp. 201–2.

9 See e.g. S. Gelbhaus, *Die Metaphysik der Ethik Spinozas im Quellenlichte der Kabbalah*, Wien-Bruen, 1917, pp. 79–81; M. Teitelbaum, *Der Rabh von Ladi*, Warschau, 1914, part II, pp. 99–120 [Hebrew].

10 H.W. Brann, "Spinoza and the Kabbalah" in ed. S. Hessing *Speculum Spinozanum 1677–1977*, London, Henley and Boston, 1977, pp. 112–113. On the gematria *Elohim* is equivalent to nature see the notes of Moshe Hallamish, *Sinai* vol. 85 [1979], pp. 265–266. [Hebrew]

[11] S. Pines, Introduction to the *Guide*, *The Guide of the Perplexed*, Chicago, 1963, p. XCVI, n. 66, idem, preface to *Le Livre de la connaissance* trs. V. Nikiprowetzky and A. Zaoui, Paris, 1961, p. 5; W.Z. Harvey, "A Portrait of Spinoza as a Maimonidean" *Journal of the History of Religion*, vol. XIX [1981], p. 162.
[12] See *Genesis Rabba*, XIII, 3 and R. Abraham ibn Ezra's *Commentary* on Ecclesiastes, XII, 14.
[13] See already in the *Commentary on Mishnah*, *Haqiqah* II, 1; *Guide*, Introduction.
[14] On the intellect as a "divine power" see already Maimonides's introduction to the *Commentary on the Mishnah*, and also M. Idel, "Sitrei Arayot in Maimonides' Thought", eds. S. Pines and Y. Yovel, *Maimonides and Philosophy*, Dordrecht–Boston–Lancaster, 1986, pp. 80–81, 90 n. 50. See below the passage from the *Commentary on the Secrets* of Ibn Ezra, attributed to Joseph ibn Caspi, which refers to this chapter of the Guide in order to comment on the gematria to be discussed in the following pages.
[15] Cf. n. 10 above.
[16] See M. Idel "Unio Mystica and Abraham Abulafia" [forthcoming].
[17] Ms Oxford, 1682 fol. 101b. On this work of Abulafia see M. Idel, *The Works and Doctrines of R. Abraham Abulafia* [Ph.D Thesis, Hebrew University, Jerusalem 1976] pp. 4–5.
[18] Exodus XXXI, 18.
[19] This is common Midrashic view; see e.g. *Genesis Rabba*, XIV, 1.
[20] Cf. his commentary on Exodus, III, 15, and Abulafia's a *Get Ha-Shemot*, Ms. Oxford 1682, fol. 102a.
[21] ibid. fol 102a–102b. For a detailed analysis of Abulafia's concept of the split of the Red Sea see Idel, *Abraham Abulafia*, pp. 190–192.
[22] ibid. fol. 102b.
[23] Ms. New York, JTS 1801 fol. 19b–20a. See also ibid. fol. 8b.
[24] Cf. Idel, *Abraham Abulafia*, pp. 174–177.
[25] *Sitrei Torah* Ms. Paris, BN 774 fol. 161b.
[26] *Ibid.* fol. 162a.
[27] As, for example, the way *Zohar* reads the first verse of the Pentateuch; cf. Gershom Scholem, *Major Trends in Jewish Mysticism*, New York, 1967, p. 221.
[28] Ms. New York, JTS 1801 fol. 8b.
[29] *Kolel*, like the "appellative" *Kinnuy* are numerically equivalent to *Elohim*, namely 86.
[30] *Genesis Rabba*, XIV, 1.
[31] *Hotam Ha-Haftarah* Ms. Roma-Angelica 30 fol. 43a.
[32] Compare however to Maimonides' *Code*, *Hilkhot Yesodei Torah*, III, 1 and to Gikatilla's *Ginnat Eqoz*, fol. 52d–53a, where the highest sphere, that designated as *'Aravot*, is described as the ninth sphere.
[33] See e.g. Maimonides, *ibidem*.
[34] See Idel, "Maimonides and Kabbalah."
[35] On the similarities between Gikatilla's *Ginnat Eqoz* and the *Commentary on the Sefar Yezirah* by R. Barukh Togarmi, a person described by Abulafia as his master, see S. Blickstein, *Between Philosophy and Mysticism* [Ph. D. Ann Arbor, 1983] pp. 184–187.
[36] Hanau 1615, fol. 5c. The gematria *Elohim=Ha-Kisse'*, already appeared in the works of Abulafia [seen. 29 above] recurs in Gikatilla's work several times: see e.g. ibid. fo. 5d, 12d, 13a, 13b.
[37] fol. 5d. This passage was paraphrased at the end of the 13th century by R. Abraham Esquira, a Spanish Kabbalist who wrote *Yesod 'Olam*, Ms. Moscow-Guensburg, 607 fol. 80b
[38] *Nistar*. Compare below the passage from an early Hasidic book, where the name *Elohim* is conceived as a shield of the Tetragrammaton. Several times in *Ginnat Egoz* Gikatilla refers to the appellative *Elohim* as comprising the Tetragrammaton: see e.g. fol. 13c, 14a.
[39] fol. 13c; this text is translated below when discussing the topic of *Natura naturans*.
[40] See par. VI below.
[41] Ms. New York, JTS 1891 fol. 70ab. On the relationship of this text to Gikatilla see E. Gottlieb, *Studies in Kabbalistic Literature* ed. J. Hacker, Tel-Aviv, 1986, p. 111.
[42] On the metaphor of the seal in connection to creation see below, par. VI.
[43] *Diglo*.
[44] *Anokhy* and *Yesod A* are numerically equivalent 81; the fact that *Anokhy's* first letter is Aleph is understood by the Kabbalist as a hint to the special category of the entity referred by this gematria. On the other hand, *Teva'* is conceived here as pointing to an hypostatic being, the ten separate intellects, referred as *Biniyan*, whose initial letter, B, is decoded as a hint to the secondary level of this entity. Compare n. 46 below.

[45] *Kisse'* and the eliptic spelling of *Eloim*, occuring in Gikatilla's text are numerically equivalent to the 81, like the first range entities; therefore, someone could draw the conclusion that the first Cause and nature are identical, a fact that Gikatilla was not ready to accept in this writing.
[46] Ms. New York JTS 1891 fol. 72b; "*B* is the secret of the intellects, which are the Structure [*Biniyan*], since they emerge from the *Yesod*."
[47] Ms. Vatican 219 fol. 10a.
[48] Ecclesiastes, I, 7.
[49] The meaning of the connection between "Shiur Qomah" and the Sea is not clear; compare, however, M. Idel, "The Sefirot above the Sephirot" *Tarbiz* vol. 51 [1982], pp. 250–251. [Hebrew]
[50] Ms. Vatican 219 fol. 9b, 11b.
[51] See Gottlieb, *Studies* [n. 41 above] pp. 110–117, especially p. 115.
[52] Warschau, 1887, fol. 11d.
[53] Compare *Ginnat Eqoz* fol. 13d.
[54] See E. Gottlieb, *The Kabbalah in the Writings of R. Bahya ben Asher ibn Halawa* Jerusalem 1970, pp. 150–51.
[55] Gate XVII, Ch. 4, Jerusalem 1962 part I fol. 83a.
[56] *Sha'arei Orah*, ed. J. ben Shelomo, Jerusalem 1970, vol. II, pp. 9–14.
[57] *Inquiries on the Nature of the Angels*, printed as an appendix to R. Margaliot's *Malakhei Eliyon* Jerusalem 1945, p. 78.
[58] Gate of Love, Ch. 7, fol. 76b; see also *ibid* ch. 11 fol. 97b.
[59] See R. Joseph ben Shalom Ashkenazi's *Kabbalistic Commentary on Genesis Rabbah* ed. M. Hallamish, Jerusalem 1984, p. 104.
[60] Cf. *'Asarah Kelei Kesef* ed. I. Last, Presburg, 1903, vol. II, p. 167.
[61] This is, since Maimonides' *Code*, a standard appellative of the Agent Intellect.
[62] *Sefer Tiqqun Ha-De'ot* ed. G. Vajda, Jerusalem, 1973 pp. 82–83. For a French translation of this passage see Vajda's *Isaac Albalaq, Averroiste Juif, Traducteur et Annotateur d'Al-Ghazali*, Paris 1960, pp. 208–210.
[63] Ms. Oxford, 1633 fol. 44b.
[64] Maimonides'impact on this work is obvious especially as far as the passage from the Guide where the tables are presented as the result of both natural and divine acts. See e.g. ms. Oxford, 836 fol. 166ab.
[65] On Abulafia's influence on this author see Idel, *The Mystical Experience* Ch. IV.
[66] Ms. Oxford, 836 fol. 165b.
[67] Genesis, II, 3.
[68] Ms. Oxford, 836 fol. 167b
[69] Jerusalem, 1977 fol. 90a. See also H.H. Ben Sason's preface to this work ibid. pp. 20–21, especially n. 82.
[70] See his *Kol Yehudah*, Muscato's Commentary on R. Yehudah Ha-Levi's *Kuzari* on I, par. 76.
[71] Cf. *Ba'al Shem Tov*, Genesis, p. 45, *Keter Shem Tov*, Part II fol. 24c.
[72] Psalms LXXXIV, 12.
[73] See e.g. R. Moses Cordovero's *Tefillah leMoshe*, Premiszlany, 1892, fol. 354b, where the Kabbalist compares the Tetragrammaton to a sword and the name *Elohim* to its sheath. See also above n. 38 where Gikatilla presented the Tetragrammaton as hidden in the appellative *Elohim*.
[74] Teitelbaum, *Der Rabh von Ladi* [note 9 above] vol. 2 pp. 43ff.
[75] See beside n. 31 above.
[76] See his *Sh'a ha-Shoel*, passim.
[77] See note 56 above.
[78] S. Pines, "The Limitations of Human Knowledge According to Al-Farabi, ibn Bajja and Maimonides" *Studies in Medieval Jewish History and Literature, ed. I. Twersky, Cambridge, Mass., pp. 82–109.*
[79] See *Abraham Abulafia*, pp. 442–443.
[80] Cf. M. Idel, "Infinities of Torah in Kabbalah" in eds. G. Hartman, S. Budick, *Midrash and Literature*, New Haven, 1986, p. 149.
[81] Idel "The Ladder of Ascension – The Reverberations of a Medieval Motif in the Renaissance" in ed. I. Twersky, *Studies in Medieval Jewish History and Literature*, Cambridge, Mass., 1984 pp. 90–93.
[82] See George D. Economou, *The Goddess Nature in Medieval Literature*, Cambridge, Mass., 1963, pp. 53–123.
[83] Henry A. Lucks, "Natura Naturans – Natura Naturata" *New Scholasticism* vol. 9 [1935], pp. 1–24.
[84] *ibid*, p. 14–18.

[85] *Jabir ibn Hayyan, contribution a l'histoire des idees scientifiques dans l'Islam, Memoires de l'Institut d'Egypt* vol. 45 [1943] p. 137 n. 2. Louis Massignon "La nature dans la pensee islamique" *Eranosjahrbuch* vol. 14 [1946] pp. 144–148. S.H. Nasr, *An Introduction to Islamic Cosmological Doctrines*, Cambridge, Mass., 1964 pp. 8–9, 61, and Gad Ben-Ami Zarfati, "Hitqarvut ha-'ivrit lilshonot Eiropah betivvukh ha-'Arvit" *Mehqarim belashon*, vol. 1 [Jerusalem, 1985], p. 255.
[86] ed. Joseph Kapih, Jerusalem, 1982, pp. 36–37, 64. A French translation of these passages was done by Mayer Lambert, *Commentaire sur le Sefer Yesira par le Gaon Saadya de Fayyoum*, pp. 30–31, 57 but this translation misses the terminological point.
[87] Cf. Moritz Steinschneider, *Hebraeischen Uebersetzungen des Mittelalters*, 1893, p. 448.
[88] *Hilkhot Yesodei Torah*, IV, 2.
[89] "*Shoken 'Ad MeAz*", *Shirei Hakodesh le R. Shelomo ibn Gabirol*, ed. Dov Yarden, Jerusalem, 1981, vol. 1, p. 10.
[90] See also the use of the verb *TV'* in a creational context in the *Alphabet of R. 'Aqiva*, a mystical Midrash which was already in existence at the time of R. Saadya Gaon, cf. *Battei Midrashot*, ed. S. Wertheimer, Jerusalem 1955, vol. 2, p. 354.
[91] Hen Merhavyah, "Out of the Poems of R. Benjamin bar Shemuel in a Latin Translation", *Hayyim [Jefim] Schirmann Jubilee Volume*, ed. Sh. Abramson, A. Mirsky, Jerusalem 1970, p. 202.
[92] ibidem, p. 203.
[93] *Hovot ha-Levavot*, gate IV, Ch. 3; Compare also Gate II, Ch. 1.
[94] *Guide of the Perplexed*, II, Ch. 29.
[95] *Sanhedrin* IV, 5.
[96] *Golden Doves with Silver Dots*, Indiana U.P. Bloomington, 1986, pp. 18–28, 138–142.
[97] Ms. Vatican 291 fol. 31a. See also Abulafia's *Hayyei ha-Nefesh* Ms. Munchen 408 fol. 38b, 54b.
[98] *Ginnat Egoz* fol. 16b.
[99] ibidem fol. 13c.
[100] ibidem fol. 13b.
[101] ibidem fol. 5d, 12d, 13cd, 16b,
[102] *Aron 'Edut* Ms. Oxfod 1633 fol. 164b.
[103] *Pardes Rimmonim*, Sabbioneta, 1554, fol. 44a.
[104] *Miphalot Elohim*, Lemberg 1863 fol. 81ab. This is by no means a complete list of the Hebrew sources that used the form *Teva' matbi'a* and *teva' mutba*; this list can be easily expanded.
[105] *The Philosophy of Spinoza* New York, 1969, vol. I, pp. 255–256.
[106] Gikatilla's work was one of the sources of R. Menashe ben Israel's exposition of Kabbalah still in manuscript, identified by Richard Popkin.
[107] See Lucks [note 83 above], p. 22.
[108] Our survey does not intend to analyze the peculiar usage Spinoza made of the Jewish mystical materials in his own writings, but mainly to draw attention to the existence and extent of the mystical material which may be relevant for a more detailed exposition of Spinoza's intellectual background. Likewise, it may well be, as Professor S. Pines had pointed out, that there may be also other sources for Spinoza's formulation *Deus sive natura*, a fact which does not, in my opinion, invalidate the probability of the influence of Jewish sources. Moreover, the repercussions of the gematria *Elohim-HaTeva'* in 18th century Hasidism remains beyond the frame of this study, this being an issue to be elaborated elsewhere. For the interesting treatment of this gematria by R. David Nieto, Spinoza's younger contemporary and the controversy it generated see A. Barzel, "Universal Nature and Particular Nature – On the Identification of God with Nature in a Sermon of David Nieto and in the Response of HeHakham Ashkenazi" *Daat* Vol. 18 [1986], pp. 67–80. [Hebrew]

JOEL L. KRAEMER

MAIMONIDES' USE OF (ARISTOTELIAN) DIALECTIC

I. PHILOSOPHY AND THEOLOGY

It is well known that the Falāsifa (Aristotelian philosophers) and Maimonides in their wake had a low opinion of the Mutakallimūn, the practitioners of "dialectical (rational) theology."[1] But this does not mean that they spurned dialectic (*jadal*) per se. There is a world of difference between dialectic as practiced by the theologians and dialectic as employed by the philosophers. The philosophers claimed that the theologians were blind to the inferior cognitive status of dialectic and to the superiority of scientific discourse, and consequently abused dialectic. If so, the Mutakallimūn were neither philosophers nor even proper dialecticians. In the view of the philosophers, following Aristotle, dialectic has a useful, indeed vital, function when employed for the right purpose and directed to the appropriate audience.

By "dialectic" I do not mean the Zenonian, Platonic, transcendental, Hegelian or Marxist versions, but the Aristotelian variety as exposited in the *Topica* and other places (see Appendix below). Accordingly, dialectic is a method of reasoning from generally accepted opinions. The premises are not verifiable or falsifiable; they are simply accepted by consensus. And this consensus rests upon the way people speak and the way they perceive appearances. Dialectical reasoning produces conclusions that are not demonstrative and scientific but restricted to the assent of specific sets of people: those who consented to the veracity of the premises.

The premises of a dialectical argument are *endoxa*. These conform, according to Aristotle, with "the knowledge held by everyone, or by most human beings, or by the wise (*he tois sophois*) among them, by all or by most of them, or by the most celebrated and distinguished (*endoxoi*) of them."[2] Examples of dialectical premises are: "We ought to do good to friends and harm enemies" (*Topica* 104a); every pleasure is good; the purpose of life is happiness; all men are created equal; it is shameful to walk around naked.

Reason is demonstrative (apodeictic) when it proceeds from premises that are true and primary, that is, they command assent through themselves and not through anything else (*Topica* 100a18ff.). A demonstrative argument rests on principles that are true, necessary and universal; and they also explain the

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 111–130.
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conclusion which must be true, necessary and universal. The apodeictic or demonstrative syllogism provides the logical form that epistemic knowledge should take. A demonstrative science, therefore, is said to be "an axiomatised deductive system comprising a finite set of connected apodeixeis or demonstrations."[3]

Aside from the scientific and dialectical syllogisms there are also eristic (contentious) and rhetorical syllogisms.[4]

The philosophers of Islam despised the theologians for not accepting the Aristotelian distinction between demonstrative and dialectical syllogisms. But this was not their only point of dissent. For one of the main political aims of the philosophers, if not their overriding aim, was to make the world safe for philosophy. And a primary objective of the theologians was to make the world dangerous for philosophy and for philosophers; for they were dead set and hell bent on philosophy bashing and defending religion with an arsenal of eristic devices, *ad hominem* arguments, *reductio ad absurdum* reasoning, and sophistical fallacies – all this *ad gloriam fidei* and *ad maiorem dei gloriam*. Nor were they taken in by the philosophers' discretional *taqiyya* (prudent dissimulation). Philosophy, in their view, was antithetical to religious faith; the philosophers belonged to the camp of heretics (*mulḥidūn, zanādiqa*), and their doom was sealed. The theologians were often playing to the gallery, currying favor with religious scholars (*'ulamā'*), cosseting the masses (*'awāmm*), indulging rulers.

Alongside philosophers and theologians a third group of intellectuals within Islamic societies professed heretical views. As opposed to the philosophers, who sustained religion while cultivating reason, the *real heretics*, like Ibn al-Rewandī (Rawandī) and others, tore to shreds every vestige of religious belief in favor of a kind of rational enlightenment. Borrowing a page from Johan Huizinga's *Homo Ludens*, we may observe that the heretics were spoil-sports who broke the rules, shattering the play world and depriving it of its illusion – a pregnant word meaning literally "in-play" (*inlusio*, *illudere* or *inludere*). Hence the heretic, apostate, or revolutionary had to be killed, evicted, banished, ejected as one who breaks the magic spell. The theologian plays the game with high seriousness, reviling those who do not – those who threaten the magic spell. The philosopher is a pretender, dissembler, simulator. He respects the magic spell; he is in play, *inlusio*.[5]

Thus the philosophers, on their part, were hardly less eager than the theologians to brace (and even embrace) religious faith. And they did this, *inter alia*, by using dialectical and rhetorical language for religious discourse. The two camps consequently shared similar goals by affirming the imperative necessity of religious faith. They parted ways however in method and strategy. For whereas the philosophers acknowledged that dialectical discourse was useful, it took a back seat to scientific discussion and apodeictic demonstration. Moreover, the theologians addressed all humans in one discourse register, whereas the philosophers projected a range of arguments at different audiences according to their readiness or receptivity (Arabic: *isti'dād*/Greek: *epitedeiotes*). I call the communicative strategy of the philosophers "rhetorical accommodation."[6]

The Islamic philosophers (e.g. al-Fārābī, Ibn Sīnā, Ibn Rushd) practiced

rhetorical accommodation by masking philosophical locutions in a religious garb. The ground for this was laid by the translators from Greek into Arabic, pioneers in naturalizing classical science, technology, medicine and philosophy within the orbit of Islamic civilization. These translators skilfully accommodated originally pagan texts, such as the famous *Theology of Aristotle* and the *Liber de Causis*, to a Middle Eastern audience by using Islamic counters for pagan vocables. For pagan "gods" they substituted "angels." Greek *nomos* (custom, usage) became Arabic *sharī'a* (religious law). Greek words for inspiration were translated by the religiously loaded term *waḥy* ("inspiration," "revelation"). The Active Intellect became the spirit of holiness, the angel of revelation or *malakūt*.The struggle to convert the world to the rule of philosophy and the sovereignty of reason was called *jihād*. And the First Cause or First Mover was named "Allāh."

The Falāsifa were no less eager than the Mutakallimūn to serve religion, and claimed that they did this more effectively. Unlike the theologians they did not stand within the circle of the myth; they stood outside it, observing and evaluating religion culturally and cognitively. Surveying the intellectual history of mankind, Alfarabi portrays philosophy as prior and superior to theology and beneficial to religion. Alfarabi describes how humans progressed through a succession of cognitive stages: from a primitive layer of poetry and rhetoric, myth and fable, to a level of dialectic and sophisticated reasoning, and finally to the rank of science and philosophy, the aim and peak of human evolution. Alfarabi deftly incorporates the parts of Aristotle's *Organon* in his cultural survey. He goes on to argue that not all men can progress to the pinnacle of science; hence the founders of national religions represent the truths of philosophy in parabolic form. In the perfect religion it is the truth of philosophy that is portrayed symbolically and not primitive rhetoric, poetry, sophistry or dialectics. Since the theologians reason from religious premises, and these premises imitate philosophical verities, they are thus twice removed from the truth. The theologians and other religionists oppose the philosophers and strive to evict them from their governing and educating role. The philosophers respond by opposing theologians and religionists, though – Alfarabi stresses – *not religion itself*. From Alfarabi's perspective, religion was a great achievement of the human spirit.[7]

Briefly put, Alfarabi teaches here that:

1. The cultural and linguistic expression of religious concepts – poetry, rhetoric, myth, fable – appears at the most primitive stage of human development.

2. Science and philosophy are the highest achievement of mankind.

3. Founders of religions express philosophical verities in figurative language for human consumption. In the perfect religion ("the best state") religious symbols represent philosophical truths.

4. Theologians reason from religious premises that imitate the truth and are thus twice removed from it.

5. Theologians and religionists try to eject philosophers from their leadership role in society; philosophers respond by opposing them but not religion *per se*.

While religion in its earliest stage precedes science and philosophy, it then follows science and philosophy as a symbolic representation of their verities. Science and philosophy may have attained the ultimate stage of human progress, but religion was always an indispensable and permanent feature of human culture and social life. These philosophers consequently devoted themselves to defending the duty and freedom to philosophize by trying to show that religion itself invited humans to contemplate.[8] Ibn Rushd (Averroes), for instance, contends in his *Decisive Treatise* that the religious law commands human beings to speculate. He cites verses from the Koran that bid mankind to reflect on creation. And he conjures up "Abraham, peace upon him," as a philosopher who probed the heavens.[9] Philosophy and religion are not at cross purposes but identical in their ultimate aim.

This should not be taken to mean, however, that Ibn Rushd strived for some kind of harmony or synthesis between philosophy and religion. I wish to stress this point, as it is the main point. The English translationn of *Faṣl al-maqāl* as *On the Harmony of Religion and Philosophy* is misleading.[10] Nor does the treatise suggest a harmony or concordance between two correlative systems; it implies a correspondence between the epistemologically superior and the inferior, not between two equivalent truth claims. Ibn Rushd is eager to establish that religion urges us to philosophize in order to protect philosophy. If Averroism teaches the harmony of philosophy and religion, then Averroes was not an Averroist.

For Averroes, science based on demonstrative arguments is prior and superior to religious discourse based upon dialectic, rhetoric and poetics. The cognitive dispositions of human beings are calibrated upon a scale – some capable of assenting to demonstrative arguments, others to dialectical arguments and another group to rhetorical claims.[11]

> For the natures of men are on different levels with respect to [their paths to] assent. One of them comes to assent through demonstrations; another comes to assent through dialectical arguments, just as firmly as the demonstrative man through demonstration, since his nature does not contain any greater capacity; while another comes to assent through rhetorical arguments, again just as firmly as the demonstrative man through demonstrative arguments.[12]

Averroes' technique of correlating a hierarchy of discourse levels to the cognitive status of target audience is traceable to the schemata of Alfarabi in his logical works and his political writings. The literary style of the Islamic

philosophers must be interpreted in this light.[13] The question to be raised always is whether a given work is intended for the sophisticated elite, for informed readers, or for ingenuous believers. Deciphering the Falāsifa requires unlocking their coded messages by determining their discourse formation and target audience.

II. DIALECTIC AND OTHER TYPES OF DISCOURSE

Maimonides' discourse analysis is significant for the exegesis of his philosophical style. He always alerts the reader to the cognitive status of his target audience, or rather audiences – as his writing was usually intended for various levels of readers. Maimonides, like Alfarabi and Averroes, used multilevel writing.[14] Hence the reader should employ multilevel interpretation. Exegesis of philosophical writing in medieval times presupposed polyvalent texts, as did medieval Scriptural and mystical hermeneutics.

The question of target audience had been raised by exegetes in late antiquity who worked within the space of a powerful rhetorical tradition. Alexandrian commentators on Aristotle, for instance, always considered the question of rhetorical stance. They first posed the exegetical questions: Who is the author of the work? What is its subject? Its purpose? And then they asked: For whom is it written? In the Middle Ages, in both Europe and the Middle East, when the classical rhetorical tradition was still vital, philosophers wrote with intended audience in mind. The contemporary reader tends to overlook this phenomenon, for this rhetorical tradition has been lost in the modern age. By the sixteeth century rhetoric was demoted to a lower rank than scientific discourse. Montaigne called it "a lying and deceitful art." Hobbes stood astride the classical rhetorical tradition and the new scientific ideal of knowledge, looking in both directions, mainly ahead to the future.[15] Spinoza, who (according to H.A. Wolfson) consummated the medieval philosophical tradition, was "a grand master of dual language and equivocation."[16] The age of modern science is pervasively anti-rhetorical, the prevalent concern being with *epistemē* rather than dialectic and rhetoric. (To be sure, even a scientific theory may be buttressed by an array of persuasive techniques that assure its survival and successful reception.)

Maimonides' understanding of dialectic and rhetoric flows from the matrix of Aristotelian logic. The *locus classicus* for his treatment of discourse hierarchy is in his *Treatise on the Art of Logic*, chapter eight, where he presents Aristotle's syllogistic scheme. Drawing upon his Muslim predecessors, he correlates it with a hierarchy of human types calibrated with their receptivity to different types of argumentation.[17]

We shall first consider Maimonides' theory of propositions and thereafter his theory of the syllogism wherein a correlation is established between levels of truth and degrees of human receptivity.

Maimonides subsumes generally accepted propositions (Arabic *mashhūrāt* = Greek *endoxa*) – as uncovering the genitals is base (*qabīḥ*) and compensating a benefactor is good (*jamīl*) – under the four kinds of propositions (*qaḍāyā*) that

are self-evident and require no proof (*dalīl*) as to their validity.[18]

The other three kinds of proposition are (1) sense perceptions (*maḥsūsāt*), (2) first intelligibles (*al-ma'qūlāt al-ūlā*) – the whole is greater than a part, two is an even number, things equal to the same thing are equal to each other[19] – and (3) traditions (*maqbūlāt*) received from one or many sanctioned individuals.[20]

Maimonides observes that while there can be no disagreement among human beings of sound sense and mind concerning perceptions and first intelligibles and no gradation[21] of certainty, there may be differences of opinion concerning generally accepted propositions, for these are propositions that have become well known among a specific nation and not another. When a certain concept is generally accepted among many nations, assent to it is stronger.[22] The same is true of traditions. They may be accepted by one people (*qawm*) and not others.[23] Note that the difference herein between sense perceptions and first intelligibles on one side and generally accepted propositions and traditions on the other is that the former (in accordance with Aristotle) are universal and certain, whereas consensual statements and traditions are circumscribed in their appeal, restricted to the assent of specific groups. In no way can information based on tradition be placed on the same level as scientific knowledge or on a higher level within the space of Maimonides' epistemology.

Maimonides gives a similar order of propositions in his *Letter on Astrology*.[24] Sources of knowledge that should be accepted as trustworthy are said to be: (1) something for which there is a clear proof derived from reason (e.g. arithmetic, geometry, astronomy); (2) sense perception; (3) what is received from the prophets or the righteous (tradition).

The four sources of knowledge enumerated by Sa'adya Gaon are similar but his epistemology is radically different.[25] He lists (1) knowledge gained by observation (*'ilm al-shāhid*); (2) knowledge by the intellect (*'ilm al-'aql*); (3) knowledge inferred by logical necessity (*'ilm mā dafa'at al-ḍarūra ilayhā*). To these he adds a fourth source – authentic tradition (*al-khabar al-ṣādiq*), which in his view "corroborates for us the validity of the first three source of knowledge." Thus for Sa'adya, an adherent of *Kalām*, authentic tradition is superior to the other three sources of knowledge as their ultimate criterion of validity. The remoteness of Maimonides' epistemology from Sa'adya's theory instances the deep gap between the philosopher and the theologian.

Returning to the *Treatise on the Art of Logic* – Having dealt with propositions (which serve as premises), Maimonides then classifies syllogisms under the headings of demonstrative, dialectical, rhetorical, sophistical and poetic, following closely in the footsteps of his mentor Alfarabi. A demonstrative syllogism (*qiyās burhānī*) is one whose premises are certain. A dialectical syllogism (*qiyās jadalī*) is one whose premises or one of them are generally accepted. A rhetorical syllogism (*qiyās khiṭābī*) is one whose premises or one of them are based upon tradition and which may have an undisclosed premises.[26] A sophistical syllogism is one whose premises deceive, lead into error or distort. A poetic syllogism has premises that set down similes or comparisons in order to praise or blame things.

Maimonides' inclusion of rhetoric and poetics in the matrix of logical syllogisms follows the Falāsifa's construction of Aristotle's *Organon*, derived in turn from Alexandrian prolegomena to the study of Aristotle.[27] In this scheme the *Rhetorica* and *Poetics* were placed among the logical works. This made sense: although the *Rhetorica* was not originally part of the *Organon*, Aristotle did countenance rhetorical syllogisms.

This extended plan of the *Organon* assumed political significance when each type of argument – demonstrative, dialectical, etc. – was directed to a specific audience, on its own level of understanding and for its own particular needs. Apodeictic, or scientific, arguments are used to address the cultivated elite and are universal, the same for all human beings. Dialectical arguments based on consensual opinion are appropriate for theologians or potential philosophers and are confined to specific religious groups. And rhetorical and poetical discourse fits the needs of the many for words of persuasion and for evocation by allegory and symbol. Philosophical rhetoric thus correlated types of discourse with levels of cognitive competence.

The layers of discourse are not equivalent but stratified: valid reasoning based on true and certain premises produces scientific knowledge; whereas dialectical, rhetorical and poetic arguments, used in discussions of theology and religion, lead only to consensus, persuasion and evocation.

III. ACCOMMODATION OF PHILOSOPHY TO RELIGION

The stratification of discourse types suggests a hierarchy of cognitive value, extending from the truth of scientific arguments to the phantasies of poetic speech. Science and religion are not reconciled on a horizontal axis; they are correlated on a vertical plane. Maimonides along with the Falasifa did not set out to harmonize science with religion, and harmony or synthesis language as applied to their enterprise is misleading. The phenomenon known as "the double truth theory," allegedly taught by some Latin Averroists in Paris, implies such harmony. It is doubtful however that such a doctrine was sincerely espoused, for the truth in Averroist terms is always one. The proper term for what the Falasifa were doing is "accommodation" – of philosophy to religion and of the philosophers to the society in which they lived. The situation is hierarchical, with philosophy at the apex of human cognition and the philosophers (scientists) at the pinnacle of society. They were sufficiently wise to act with *philanthropia* toward the other classes of humanity, which meant taking upon themselves social and political responsibilities.

Scholars who surmise that harmony or synthesis was the aim of the Falāsifa fail to tell the difference between stratagem and strategy. The Falāsifa were not averse to *presenting* their enterprise as reconciling philosophy with religion (*al-jam' bayn al-ḥikma wal-sharī'a*). But this was a tactic of survival intended to protect philosophy in the first place and religion in the second.

Occasionally, accommodation was by *force majeure*, that is, to protect philosophers from danger. Consider the account of the interview between Ibn Rushd and the Almohade ruler Abū Ya'qūb Yūsuf (1163–84).[28] Ibn Rushd

related that when he visited the ruler, he found him alone with the philosopher Ibn Ṭufayl. The Prince of Believers asked Ibn Rushd about creation and eternity according to the view of the philosophers. Paling, Averroes anxiously denied that he ever occupied himself with philosophy, unaware that his colleague Ibn Ṭufayl had told the ruler about his involvement in the subject. The other thing the philosopher didn't know was that the caliph was himself a philosopher, or at least a student of philosophy as his association with Ibn Ṭufayl betokened. He put Ibn Rushd at his ease and rewarded him with money, a robe of honor and a steed. Averroes' conduct was, to be sure, existential or save your skin accommodation, which is not our main concern.

IV. THE ORIGIN AND FUNCTION OF KALĀM

Maimonides, "disciple of Alfarabi," disdained the Mutakallimūn, theological defenders of the faith. But this does not imply that he rejected the proper use of Kalām and dialectic. Maimonides' posture on the nature of Kalām and the proper use of dialectic is decisive for fathoming his thought in general and the *Guide* in particular, which is a Kalām work (see below).

Maimonides' understanding of the nature and development of Kalām is inspired by Alfarabi, particularly the view that Kalām is a defense of religion originating in Christian theology.[29]

In his thumbnail history of Kalām (*Guide*, I, 71), Maimonides explains that it emerged when the areas where the Greeks and Syrians lived came under a Christian polity wherein the ruler protected religion. Greek and Syrian scholars began to refute philosophy, and thus arose the discipline of Kalām. The theologians employed useful premises and refuted opinions that tended to subvert the principles of the religious law. In sum, Maimonides adopted the view, which has been championed by Alfarabi, that the function of Kalām consists in defending religion, which means that it does not consider attainment of the theoretical truth as an intrinsic value.[30]

Philosophically, Maimonides deprecates the physical theory of the Mutakallimūn – as he saw it – according to which whatever can be imagined can happen. They acknowledge no causality, that is, no secondary causes, only the dominant will of God; no ordered universe; no nature, only custom and arbitrariness. All this, says Maimonides, is bent to conform with their ideas, so that instead of shaping their ideas to conform with what exists, they make what exists conform with their ideas, substituting imagination for intellect.[31]

Now it is generally held that Kalām arose from Greek and Syriac Christian theology just as Maimonides, following Alfarabi, presents it. Maimonides makes Johannes Philoponus (who has attracted much attention in recent years) a vital link in this transmission. Philoponus was a Christian Neoplatonist who assailed Aristotelian science in what has been called by Richard Sorabji "an attack ... tailored to fit his Christian belief."[32] He lived in the sixth century when a Neoplatonic system was cultivated in the schools of Athens and Alexandria. In Alexandria, Neoplatonic philosophers, such as Philoponus and later Elias and David, who were Christians, and even Ammonius, who

was not, strived to present Aristotle in a light favorable to Christianity. (Yet we must also consider genuine philosophical criteria in their appraisal of Aristotle.)

The Athenian Neoplatonists were outraged by this concession, Damascius even claiming that Ammonius made a "sordid deal with the Christians for financial gain."[33] Philosophy was taught at Athens until the Emperor Justinian closed the Athenian school in 529. The pagan Simplicius went on teaching philosophy and poured scornful invective upon Philoponus, accusing him of practicing "eristics and eristic chatter" and of being contentious and in search of glory.[34]

The tirade of the Neoplatonic philosophers against the Christian theologians is reminiscent of the strictures of Islamic Falāsifa against the Mutakallimūn. Simplicius, incidentally, may have recommenced teaching at Harran (Carrhae) where a pagan school survived well into the period of Islam.[35] (It will be recalled that Maimonides devotes earnest attention to the pagan Sabians of Ḥarrān in *Guide*, III, 29). Philoponus was, of course, kept very much alive in the Islamic milieu, where his arguments for creation of the universe were invoked by Christian, Muslim and Jewish theologians.[36] (By a wonderful historical paradox, the great Proclus, the arch proponent of paganism, was simply naturalized as a citizen of Islam in the *Kitāb fī al-maḥḍ al-kayr*, known to the West as the *Liber de causis*.)

The claim of the philosophers and Maimonides that the theologians were essentially apologists, disputatious and eristic, while occasionally overstated, is not a pure caricature. Kalām was indeed contentious by nature; it was dialectic in argumentation and dialogic in style.[37] After an initial period of overlap and common orientation and vocabulary in the ninth century, the lines between Falsafa and Kalām became strictly drawn in the tenth, and the Falāsifa and Mutakallimūn separated into two warring camps.[38]

The disputatious character of Kalām left traces on systematic works written in dialogic form of question and answer. The pattern was used in disputations between Muslims and Jews, Muslims and Christians, Muslims and Zanādiqa (heretics) in a stylistic ritual of debate, with forms of etiquette, in which tricks were employed against opponents. Kalām discussions used arguments based on analogy, *argumentum e contrario*, *diairesis* (*taqsīm*), and so on.[39] The form of debate occasionally led to religious skepticism, expressed in "the equivalence of proofs" (the theory that all proofs are equally valid or invalid) – a sign of intellectual bankruptcy according to its detractors.[40]

There was, however, a constructive aspect to Kalam dialectic: since debates had to be based upon reason rather than Scripture and tradition, we find a kind of tolerance in theological circles.[41]

It was necessary in debate to agree upon certain postulates. In the protocol of a debate between Theodore abū Qurra and a Saracen, the latter requests to rest the case on "necessary and agreed upon principles."[42] But the difference between the dialectic of theologians and that of philosophers is that the latter try to get their opponents to consent to certain premises and to accept one's proof as ancillary to the *primary aim* of hitting the truth. In an epistemic

dialogue one seeks the truth; indeed the discussion may take place with oneself in a philosophic monologue.

V. ARISTOTLE'S *Topica* ON THE FUNCTIONS OF DIALECTIC

While it is true that Aristotle favored epistemic method, he also prized the value of intelligent discussion (dialectic) and oratory (rhetoric). Aristotle distinguishes scientific procedure based upon apodeictic syllogisms and dialectical–rhetorical method which uses *topoi* and accepted opinions. There are differences between dialectical and rhetorical syllogisms, the main one being that in a rhetorical argument one may skip steps and present the argument in a more pithy, truncated way, or use paradigms.

In a crucial passage, in *Topics* 101a25–b4, Aristotle explains the utility of dialectic, listing three of its functions: (1) It is evident from the facts themselves that it is useful for gymnastic exercise;[43] for if we have a methodical procedure of inquiry, we will more easily be able to undertake the subject proposed to us. (2) It is useful for encounters; for if we have catalogued the beliefs (*doxas*) of the many, we will meet them, not from other people's but from their own views (*dogmatōn*), and redirect whatever remarks of theirs appear to us to be incorrect. (3a)[44] It is useful for the philosophic sciences, because if we fully examine the puzzles on each side (*diaporesai*), we will more easily see what is true or false. (3b) And it is also useful for the first principles (*ta prota* [*archōn*]) of each science. For we cannot say anything about them from the proper first principles of the science in question, since the first principles are prior to everything else. Hence it is necessary to discuss them through the common beliefs (*endoxōn*) on each subject. And this is proper to dialectic alone, or to it more than to anything else; for since it examines, it has a road toward the first principles of all disciplines.[45]

Aristotle's *Topica* (*Kitāb al-Jadal*) was well-known to the Islamic philosophers.[46] Alfarabi wrote several works based upon it; Ibn Sīnā devoted a long section of the Logic of the *Shifā'* to it; and Ibn Rushd wrote a short and middle commentary on it.[47]

Specifically, the above-cited text from *Topica* 101a25–b4 had a powerful impact upon the Falāsifa. It was critical for their understanding of Aristotle's scientific method and served as a basis for the notion of dialectic as instrumental for conversation with the many.

In Alfarabi's *Kitāb al-Jadal*, in a section on the function and importance of dialectic, based on this Aristotle text, he lists five ways in which it is useful, which I summarize here:[48]

(1) Dialectic trains a human being and prepares his mind for the demonstrative sciences. It does so by habituating him in research, teaching him how to execute it, and how to organize its propositions so as to attain the objective. Dialect instructs him to reject (*'inād*)[49] theories at the first blush of opinion (*bādi' al-ra'y*) and prevents him from yielding to prejudice, passion and partisanship. One should doubt all opinions as

potentially false and erroneous. Dialect makes a person test received opinions which he first came upon and in which he was habituated. It also brings many to doubt sensibles and test them, as happened with Parmenides and Zeno to the extent that they claimed that motion and multiplicity do not exist and that existent being is one.

Without the dialectical faculty, one cannot attain the truth. We thus find that Aristotle gave precedence to dialectical statements in all matters he sought to explain – in physics, metaphysics and political science. Only then did he go on to demonstrative proofs. Therefore, it is impossible for a human being to attain truth and reach philosophy save by the dialectical faculty. And just as human civilization passes through this stage, so must each individual.[50]

(2) Dialectic provides the subject matter for the exact sciences (*al-'ulūm al-yaqīniyya*). It prepares for them the generally accepted premises, among which are found the true, universal, and primary premises that are the principles of the demonstrative sciences. And it also provides for them all the *quaesitae* (*maṭlūbāt*). When all this is present, then one must test and examine them by rules and demonstrative and scientific stipulations catalogued in the *Posterior Analytics*.

(3) Dialectic provides the initial dialectical doubt (*al-tashakkuk al-jadalī*) without which nothing can be perfectly apprehended. Setting up opposing arguments is a prerequisite for the demonstrative art which ultimately removes initial doubt and perplexity (*ḥayra*). Therefore it is rare that we find Aristotle discussing these sciences in which he sought proof without dialectical puzzles (*tashkīkat jadaliyya*).[51] To these he added proofs. Therefore, Plato commended dialectic for the education of princes in the best city (*al-madīna al-fāḍila*) and for philosophers, after mathematics and before the other three sciences.[52]

(4) Aristotle often said regarding his exoteric philosophy that he wanted to teach the masses the generally accepted opinions (*mashhūrāt*); the philosopher thereby shares these with them; he is protected, and his enterprise is not rejected; for the masses tend to reject what is alien to them. A philosopher may intend to teach the masses opinions that are true, certain and demonstrative. But as the proofs of these statements are remote and alien for them, he will prefer to teach them these opinions by way of dialectic or rhetoric, thereby disseminating among them necessary opinions (*ārā' ḍarūriyya*)[53] that are beneficial to them. He does this by means of political governance (*al-tadbīr al-madanī*).[54]

(5) Only dialectic can cope with sophistry and defends philosophy from it.

Averroes similarly stresses the usefulness of dialectic in addressing the many, that is, its political function. In his *Middle Commentary on the Topics*, Ibn Rushd elaborated upon Aristotle's remarks concerning the utility of dialectic.[55]

Accordingly, dialectic has three functions: mental exercise; disputation (*munāẓara*) with the many; the theoretical sciences.

(1) Mental exercise (*riyāḍa*) leads to the sciences. If we have rules and methods to assent to something or deny it, then we can test opinions (*ārā'*) and doctrines and distinguish between the true and false competently, just as exercising a horse in training exercises prepares it for war.

(2) Disputation (*munāẓara*) with the many is useful because of a necessity that brings them to associate on the basis of justice and virtue and to believe in many of the theoretical things that benefit them in political association. If this is so, and as theoretical things cannot be assented to save by way of generally accepted opinions, it is best that the theoretical things be posited for them by generally accepted propositions, for they are more difficult to oppose (*'inād*) than rhetorical and poetical propositions, although rhetorical and poetical methods may be used on these occasions instead of dialectical methods. This has been elucidated in political science.

(3) Dialectic benefits the theoretical sciences in several respects. When we wish to reach the truth and this is difficult, we can use dialectic. This is done in physics, theology and politics, but not in the mathematical sciences. Thus we find that Aristotle brings demonstrative proof in these three sciences only after a dialectical raising of doubt (*tashkīk jadalī*).

Ibn Rushd clearly marks the difference between the philosopher and the dialectician. The philosopher uses demonstrative syllogisms and carries on a self-persuasive monologue, his loftiest aspirations centering upon the question of the truth of his premises. In contrast, the dialectician formulates questions and answers, and he must always address himself to another person.[56]

In his *Short Commentary on the Topics*[57] Ibn Rushd states in a similar vein that dialectic conveys belief proximate to certainty and is close to demonstrative philosophy. In this work he aims a sharp critique at the theologians, excoriating them, inter alia, for being ignorant of the art of dialectic. The main advantage of dialectic, in Averroes' view, is to serve as a defensive weapon that is capable of saving both philosophy and religion. It is a weapon that should be kept in the hands of the sages and philosophers, and it should be wrested from the theologians who have distorted it. In the ideal regime ("the best city") the sages will govern. And in such a regime dialectic will be employed for preparing those who aspire to belong to the category of the sages. It will provide explanations for the few who succeed in transcending the level of the masses without, however, attaining the rank of the sages.

VI. THE GUIDE, A KALĀM WORK

In the light of the above, it becomes clear, in my opinion, that the *Guide of the Perplexed* is *essentially* a dialectical work. Its Kalām nature has already been noted by L. Strauss and S. Pines, followed by L.V. Berman and this writer. The

question raised by Leo Strauss whether it is a Jewish or philosophic book must be framed in Maimonides' own terms; that is, we must ask what kind of arguments Maimonides uses. In other words, is it a demonstrative (scientific or philosophic) book, or is the status of its argumentation dialectical, rhetorical or poetical?

It is certainly possible to find in the *Guide* arguments that purport to be demonstrative alongside dialectical, rhetorical and poetical statements. But in design and purpose the *Guide* is preponderantly a dialectical, namely, a Kalām or theological work.

(1) The first sign of its dialectic character is its literary genre and rhetorical style. It is written as an extended epistle to Joseph son of Judah and to those like him who were potential philosophers, and it is aimed at arousing them to pursue an understanding of philosophy's hidden treasures. That is, it is a protreptic work, an arousal (*tanbīh*) to philosophize. Maimonides occasionally alludes in the *Guide* to scientific arguments that may be found in philosophical works.[58] Part One of the *Guide* which consists of a Biblical hermeneutical excursus is apparently meant for a fairly wide audience. It is perhaps correct to say that it is directed to the many through the medium of the teachings of the wise, who are commended as those who should be followed.

(2) The condition of perplexity, the state of mind of the recipient of the *Guide*, is a stepping-stone in the dialectic procedure. And solving puzzles (*aporiai*) is a central feature of the dialectic process. The Arabic translations commonly rendered *aporia* by *ḥayra* or *taḥayyur*, which is the word used by Maimonides for perplexity in the title of his book and throughout.

(3) Maimonides held the view that the human intellect has absolute limits (I, 31, beginning), and that on virtually all metaphysical and cosmological questions (including celestial mechanics and the question of the eternity of the universe) it cannot go beyond dialectical argumentation to the stage of demonstrative proof. There is a strong skeptical strain in Maimonides' thought, found also in his medical writings. He satisfied himself that he had brought demonstrative proofs for the existence, oneness and incorporeality of God, but that is all. (Ibn Rushd claimed only dialectical validity for these beliefs.) Maimonides held a negative theology: the more one says about the deity, the further one is from the truth, unless one is denying some predicate of God.

(4) The argument for creation and eternity is treated by Maimonides dialectically. It belonged to the realm of what Kant later called the antinomies of the transcendental dialectic. Aristotle (*Topica* 104b8) had given the question of whether the universe is eternal or not as an example of a dialectical problem. Maimonides refers to this text in *Guide*, II, 15 (tr. Pines, 292):

> You know the text of his [Aristotle's] words, which reads as follows: As for the 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. This is literally what he says. However, you know Abū Naṣr [al-Fārābī's] interpretation of this example, which he made clear with regard to it, as well as the fact that he considered disgraceful the notion that Aristotle could have doubted the eternity of the world.[59]

Maimonides' text follows, more or less, the Arabic translation of the *Topica*. But it is a bit closer to the citation of Alfarabi in his middle commentary on *Kitāb al-jadal*, which clearly was his source.[60] Maimonides cites this important text to show that Aristotle himself considered the question of creation versus eternity a dialectical issue for which there was no demonstrative argument.

Maimonides' discussion of creation and eternity is preceded by an enumeration of three opinions that had been propounded.[61] This was his usual way of introducing dialectic discussions, just as Aristotle before him prefaced such deliberations by enumerating opinions of predecessors. And providence likewise is treated dialectically (*Guide*, III, 17–18) and introduced by a list of opinions that are held on the subject.[62] The same is true of prophecy (II, 32).

It is common to read discussions in scholarly literature concerning the topics of creation, providence and prophecy in Maimonides that take no account whatever of the type of argument he employs to support his claim. False issues are then raised, for instance – Did Maimonides really believe in creation or did he harbor a secret commitment to the Aristotelian theory of an eternal universe? On these questions his pervasive view was that humans cannot get beyond claims based upon the consensus of specific groups. And in these matters there can be no scientific knowledge predicated upon valid reasoning from true premises (i.e. those which correspond with reality). In these instances Maimonides' position may be formulated in propositions of the form: "To be a member of the Jewish people (or believers in monotheism) means to assent to a belief in creation and miracles, providence, prophecy, etc." For Maimonides to hold a secret Aristotelian position on creation would imply a view that the opposing thesis of eternity could be demonstrative, a position that he clearly did not hold.

The *Guide* is not a philosophical book (in the sense in which Maimonides and his colleagues used the word) but (as Leo Strauss claimed) a Jewish book – a *defensor fidei*. It is significant that Muslim contemporaries considered the *Guide* a Jewish book. The words of 'Abd al-Laṭīf al-Baghdādī are very telling: "[Maimonides] composed a book for the Jews, named it the *Guide* (*Kitāb al-dalāla*), and cursed whoever would write it in other than Hebrew script. I studied it and found it to be a bad book; he destroys the foundations of the laws and creeds while supposing that he improves them."[63] Bar Hebraeus (Ibn al-'Ibrī) writes: "[Maimonides] was learned in the Law of the Jews and composed a book on the religion of Israel and called it 'the *Guide*.' Some of them praise it, and some condemn it, calling it 'the *Misguide*' (a pun on the word *dalāla* "guide"). I met a group of Jews from the lands of the uncivilized Franks who

cursed him and called him an unbeliever."[64] Ibn Abī Usaybi'a calls it "a great book on the doctrine (*madhhab*) of the Jews."[65]

VII. CONCLUSION

We have seen that the Islamic philosophers, following the lead of Aristotle, had high regard for dialectic and rhetoric. Indeed Aristotle was trying in the *Topics* to substantiate a type of rational discussion in the context of probable and plausible knowledge. It concerns the area of contingency rather than necessity, working on the basis of the probable and attaining less than certainty in its conclusions. Maimonides, in fact, saw Aristotle as a tentative thinker who did not believe that he had demonstrative proofs for celestial mechanics and for the eternity of the world but only theories that were probable.[66]

Maimonides understood Aristotle much as the masters of the arts in European universities later did in the thirteenth century, namely as the researcher, the questioner, "the hunter, the discoverer, the seeker – the one who subjected the teachings of his predecessors to a relentless critique, who was subservient to no authority and free from all dogmatism."[67] The masters of the arts intended their own works to be searching and critical unlike the writings of the theologians. Thus they rejected the method of *concordia discordantium* of previous truth revealed by faith to which scientific or philosophical truth must conform. This philosophical discourse laid the foundations for the great philosophical achievements of the late Middle Ages.[68]

APPENDIX

The Aristotelian sense of dialectic is intended by Karl Popper when he says in "What is Dialectic?": "One at least of its ancient meanings is very close to what I have described above as 'scientific method'. For it is used to describe the method of constructing explanatory theories and of the critical discussion of these theories, which includes the question whether they are able to account for empirical observations, or, using the old terminology, whether they are able to '*save the appearances*'."[69]

While Aristotle favored scientific method, he also valued intelligent discussion, the art of conversation (*dialektikē technē*). Aristotle distinguished between two kinds of discourse: (1) scientific procedure (*epistemē/scientia*) based on apodeictic syllogisms and (2) dialectical method which makes use in its syllogisms of generally accepted propositions called *endoxa*.[70]

Apodeictic syllogisms have premises that are true and primary, that command assent through themselves and not through anything else (100a18ff).[71] An example may be taken from the universal affirmative inference in the first figure, given among the syllogistic figures in *Prior Analytica*, Book I.

A holds of every B

B holds of every C

- - - - - - - - -

A holds of every C

Łukasiewicz notes that the syllogism:

All men are mortal, Socrates is a man, therefore Socrates is mortal, is not Aristotelian. (With "animal" instead of "mortal," Sextus Empiricus cites it as a Peripatetic syllogism.) The reason is that Aristotle does not include singular terms or premises in his scheme. Łukasiewicz presents the Aristotelian syllogism as an implication with the conjunction of the premises as antecedent and the conclusion as consequent.

Ex. If all men are mortal, and all Greeks are men, then all Greeks are mortal.

If all B is A,

and all C is B,

then all C is A.

In Aristotle's terms (Barbara):

If A is predicated of all B,

and B is predicated of all C,

then A is predicated of all C.

Aristotle's model was apparently mathematical, or (pre-Euclidean) geometrical, as may be discerned in some of his examples and logical terminology.[72] But the case for the mathematical model is not as potent as usually surmised, and the procedure of demonstration was not devised exclusively or primarily for the mathematical sciences.[73]

The difference between demonstrative and dialectical syllogisms is not so great as may be surmised at first blush. They both originate and exist in the sphere of dialogue. Premises in both are called *protaseis*, that is, propositions offered to someone else for consent. In the *Analytics* the term *erotan* (to question) is used at times in the sense of "lay down a premise." A syllogism is meant to be proffered to a second person in a conversational argument. The doctrine of demonstrative science, as Jonathan Barnes argues, does not guide or formalize scientific research and discovery; it rather teaches me how to demonstrate knowledge that is acquired, as shown by the word *apodeixis*, which means to make public.[74]

In fact, the first principles of demonstrative arguments, which must be "true" and "undemonstrated," may be reduced to matters of consent.[75] For example, the Principle of Non-Contradiction is accepted by people who have *paideia* ('acculturation', 'moral education') (*Metaph.* IV, 4). Those who question this

principle do so out of *apaideusia*; they live apart from the human community, like the Cyclopes. This principle is the starting point of human discourse. Aristotle handles Parmenides' One in the same way. No one who behaves in the human world seriously maintains this position. All action is based upon movement and plurality. Aristotle uses this argument in *Metaph.* IV, 4, when speaking of the Principle of Non-Contradiction, stating that the opponent admits his acceptance of the principle in his behavior. "It is most obvious that nobody really is in this condition,[76] neither those who make the argument, not anybody else. For why does he go to Megara and not stay put, when he thinks he should go? Why doesn't he go straight out early in the morning and throw himself into a well or off a precipice ..." (1008b14–19). And in like manner Aristotle replies to Parmenides' profession that change and motion are conventional.[77]

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NOTES

[1] The first version of this paper was given at the Sixth Jerusalem Philosophical Encounter in May, 1985 but not included in the volume that ensued, *Maimonides and Philosophy*, ed. S. Pines and Y. Yovel (Dordrecht, 1986). A revised version was subsequently given at the Wellcome Institute and thereafter as one of the Momigliano lectures at the Committee of Social Thought, The University of Chicago.

[2] See *Topica* 100b21–23, 104a8–12, 165b3–4, 170a33, 40, b7–11, *Analytica Priora* 81b18–20; *Metaphysica* 995b23–4.;Terence Irwin, *Aristotle's First Principles* (Oxford, 1988), 37–38; and see the literature cited there on p. 494, n. 42.

[3] J. Barnes, "Aristotle's Theory of Demonstration," in *Articles on Aristotle 1, Science* (London, 1975), 65–87, at 65 (first published in 1969).

[4] See E. Kapp, "Syllogistic," in *Articles on Aristotle*, 35–49, at 35 (first published in 1931). For eristic syllogisms, see *Topica*, I, 1, 100b23, which foreshadows *Sophistical Refutations*, appended to the *Topica*; and for rhetorical syllogisms, see *An. Pr.* II, 23, 68b11ff. and *Rhetorica*, passim.

[5] See J.L. Kraemer, "Heresy versus the State in Medieval Islam," in *Studies in Judaica, Karaitica and Islamic* (Ramat Gan, 1982), 167–80, were Huizinga's *Homo Ludens: A Study of the Play Element in Culture* (Boston, 1955), 11–12, is cited.

[6] See J.L. Kraemer, "The *Jihād* of the *Falāsifa*," *Jerusalem Studies in Arabic and Islam*, 10 (1987), 288–324.

[7] F.W. Zimmermann, *Al-Farabi's Commentary and Short Treatise on Aristotle's* De Interpretatione (Oxford, 1981), cxiv, n. 1, from Alfarabi's *Book of Letters (Kitāb al-Ḥurūf)*, ed. M. Mahdi, paras. 108–13, 129, 140–53. And see L.V. Berman, "Maimonides, the Disciple of Alfarabi," *Israel Oriental Studies*, 4 (1974), 154–78, at p. 156.

[8] See L. Strauss, *Philosophy and Law: Essays toward the Understanding of Maimonides and his Predecessors* (Philadelphia, 1987), 40ff.

[9] See ed. G.F. Hourani, *Kitāb Faṣl al-Maqāl* (Leiden, 1959), 1–2; tr. Hourani, *Averroes on the Harmony of Philosophy and Religion* (London, 1961), 44–5 (with pagination of the text in the margin). Cf. also Maimonides, *Guide*, II, 39.

[10] The full title is probably *Kitāb Faṣl al-Maqāl wa-taqrīr mā bayn al-sharī'a wal-ḥikma min al-ittiṣāl*. See Hourani's edition, p. 7, 15–16. In two manuscripts of Ibn Abī Uṣaybi'a, *'Uyūn al-Anbā' fī ṭabaqāt al-aṭibbā'*, ed. A. Müller (Konigsberg, 1884), II, 77, the word *al-muwāfaqa* is added, and Hourani compares this to Ibn Rushd's use of this term and *muṭābaqa* in *Manāhij al-Adilla*.

[11] Averroes quotes here a felicitously appropriate verse from the Koran: "Summon to the way of your Lord by wisdom and by good preaching, and debate with them in the most effective manner" (Koran 16:125). See *Decisive Treatise*, p. 6; p. 92, n. 56.

[12] *Decisive Treatise*, 6 (text), 49 (trans.); and see Hourani's note, p. 92, n. 56.

[13] On philosophical style, see L. Strauss, *Persecution and the Art of Writing* (Glencoe, 1952); and also Berel Lang's *Philosophy and the Art of Writing: Studies in Philosophical and Literary Style*

(London, 1983); idem, *The Anatomy of Philosophical Style* (Oxford, 1990); idem (ed.), *Philosophical Style: An Anthology about the Reading and Writing of Philosophy* (Chicago, 1980).

[14] See the excellent discussion of multilevel writing by Miriam Galston, in her *Politics and Excellence: The Political Philosophy of Alfarabi* (Princeton, 1990), passim (references in Index, 238).

[15] See Victoria Kahn, *Rhetoric, Prudence, and Skepticism in the Renaissance* (Ithaca, 1985), 28, 115ff.

[16] Y. Yovel, *Spinoza and Other Heretics* (Princeton, 1989), I, 29. On Spinoza's use of dual language and equivocation, see pp. 28–30, 113–6, 128–152. Yovel consciously follows Leo Strauss in his understanding of Spinoza's rhetorical technique; see Strauss, *Spinoza's Critique of Religion*, trans. E.M. Sinclair (New York, 1965). But whereas Strauss traced this back to Maimonides, Yovel (less convincingly in my opinion) evokes the more direct tradition of "Marrano culture and linguistic habits"(pp. 30, 150–2). To be sure, one does not exclude (but may even reinforce) the other if Yovel is right about Marrano influence.

[17] See E. Efros, "Maimonides' Arabic Treatise," *PAAJR* 34 (1966), 21–24; and idem, Maimonides' *Treatise on the Art of Logic* (New York, 1938), 47–49 (Eng. trans.). See also A. Hyman, "Demonstrative, Dialectical and Sophistic Arguments in the Philosophy of Moses Maimonides," *Moses Maimonides and his Time*, ed. Eric L. Ormsby (Washington, D.C., 1989), 35–51.

[18] In *Guide* I, 2, Maimonides stresses that through the intellect one distinguishes between truth and falsehood, whereas fine and bad belong to things generally accepted as known (=*endoxa*), not those cognized by intellect. Fine and bad (*ḥasan, qabīḥ*) are equivalent to Greek *kalon* and *aischron* (morally fine or morally base) and are definitely *not* aesthetic categories.

[19] See A.-M. Goichon, Lexique de la langue philosophique d'Ibn Sīnā (Avicenne) (Paris, 1938), p. 235, no. 443, where *ma'qūlāt ūlā* (*prima intelligibilia*), are identified with *muqaddamat* that are assented to, as "the whole is greater than the part."

[20] See D.M. Dunlop, ed. and trans., "Al-Farabi's Introductory Sections in Logic," *Islamic Quarterly*, 2 (1955), 275, n. 2 and 264; and Alfarabi's *Kitāb al-jadal*, ed. R. al-'Ajam, in *al-Manṭiq 'inda al-Fārābi*, vol. 3 (Beirut, 1986), 19, for premises that are traditional, generally accepted, sensible and certain (*maqbūlat, mashhūrāt, mahsūsat, yaqīniyya*).

[21] The word is read *tafāḍul* in the edition of Efros. Efros prefers the variant *tafāṣul*. Ibn Tibbon (Efros, 40) did not understand the text; Ahituv (Efros, 86) and Vivas (Efros, 113) apparently read tafāḍul. And see Efros, Introduction, 5. d.

[22] Cf. Alfarabi, *Kitāb al-Jadal*, 17, where he states that assent to dialectical propositions depends upon the consensus of people, their reliability as authorities and their number. It is greatest when all human beings assent. He also asserts (p. 19) that these propositions are accepted by different nations in different regions and having different characters and languages.

[23] For *qawm* we may understand "religious communities" in accordance with Maimonides' terms of reference.

[24] See *Letter of Astrology*, ed. A. Marx, *HUCA* 3 (1962), 350; trans. R. Lerner, *Medieval Political Philosophy: a Sourcebook*, ed. R. Lerner and M. Mahdi, p. 228. And see the edition of Shailat, *Letters*, 474–90, at 479.

[25] *Kitāb al-Amānāt wal-I'tiqādāt*, ed. J. Kafih (Jerusalem, n. d), 14–15; *The Book of Beliefs and Opinions*, trans. S. Rosenblatt (New Haven, 1948), 16–18

[26] For rhetorical syllogisms, see *Analytica Priora*, II, 23, 68b11ff; and *Rhetorica*, passim. In *Rhetorica*, I, 1, 1355a24–7, Aristotle says that the rhetorical argument is used for people who cannot be persuaded by reasoning in accordance with knowledge. As the purpose of a rhetorical syllogism is to persuade, it has no truth value. See also Alfarabi's *Kitāb al-Khaṭāba*, ed. and trans. J. Langhade and M. Grignaschi (Beirut, 1971).

[27] See R. Walzer, "Zur Traditiongeschichte der Aristotelischen Poetik," in *Greek into Arabic: Essays on Islamic Philosophy* (Cambridge, Mass., 1962), 129–36. The Alfarabian program, which Walzer claimed continued the Alexandrian syllabus toward the end of its development, divided types of argument or syllogisms into scientific, dialectic, refutation of sophisms, rhetorical persuasion and poetical evocation. And see Zimmermann, *Al-Farabi's Commentary*, xxii–xxiii; Deborah L. Black. *Logic and Aristotle's Rhetoric and Poetics in Medieval Arabic Philosophy* (Leiden, 1990); and S. Kemal, *The Poetics of Alfarabi and Avicenna* (Leiden, 1991).

[28] The account is given by 'Abd al-Wāḥid al-Marrakūshī, *Kitāb al-Mu'jib fī talkhīṣ akhbār al-Maghrib*, ed. R. Dozy, 2nd ed. (Leiden, 1881), 174–5. See the translation and discussion by Hourani, *Averroes On the Harmony of Religion and Philosophy*, 12–14. Al-Marrakūshī says he heard the report from a pupil of Ibn Rushd who had heard it from his teacher. It may nevertheless be anecdotal.

[29] See the Introduction by S. Pines to his translation of *The Guide of the Perplexed* (Chicago, 1963), cxxv–cxxxi; H.A. Wolfson, *The Philosophy of the Kalam* (Cambridge, Mass. and London, 1976), 43–58.

[30] See Pines, "Translator's Introduction," cxxvi. And see also pp. lxxxiii–lxxxv. And see S. Stroumsa, "Al-Fārābī and Maimonides on the Christian Philosophical Tradition: a Re-evaluation," *Der Islam* 68 (1991), 263–87.

[31] Maimonides cites Themistius (*Guide*, I, 71; Pines, p. 179). Cf. Aristotle, *Topica* 173a29ff., 161b33ff.; E. Weil, "The Place of Logic in Aristotle's Thought," in *Articles on Aristotle*, 88–112, at p. 103. Aristotle says: "Convention (*nomos*) is the opinion (*doxa*) of the majority; but wise men (*sophoi*) speak and argue (*legousin*) in accordance with nature and with the truth." And see especially *Metaphysica*, IV, 6, 1011a20ff. Moses of Narbonne expressed wonder in his comment on this passage that Maimonides cited Themistius and not the well-known passage from the *Metaphysica*. He suggests that in writing the *Guide* Maimonides followed "the moderns" (i.e., commentators such as Themistius) rather than Aristotle himself – an insight worth following up. See *Der Commentar des Rabbi Moses Narbonensis ... zu dem Werke More Nebuchim des Maimonides*, ed. J. Goldenthal (Vienna, 1852), 15b; and S. Munk, *Le guide des égarés* (Paris,, 1856–66), I, 345, n. 4.

[32] R. Sorabji, *Philoponus and the Rejection of Aristotelian Science* (Ithaca, 1987), 1.

[33] Traces of these tensions are found in Islamic sources; see J.L. Kraemer, "A Lost Passage from Philoponus' *Contra Aristotelem* in Arabic Translation," *Journal of the American Oriental Society*, 85 (1965), 318–27.

[34] P. Hoffmann, "Simplicius Polemics," in Sorabji, *Rejection*, 64.

[35] This, at least, is suggested by Michael Tardieu, "Ṣābiens Coraniques et "Ṣābiens" de Ḥarrān." *Journal Asiatique*, 274 (1986), 1–44, at 22–23.

[36] See Philoponus, *Against Aristotle, on the Eternity of the World*, trans. C. Wildberg (London, 1987).

[37] See J. van Ess, "Disputationspraxis in der islamischen Théologie. Eine vorläufige Skizze," *Revue des Etudes Islamiques*, 44 (1976), 23–60, at p. 23: "Theologie ist im Islam, mehr vielleicht als in anderen Religionen, eine streitbare Wissenschaft, dialektisch in der Argumentation und dialogisch im Stil."

[38] See J.L. Kraemer, *Humanism in the Renaissance of Islam*, 2nd ed. (Leiden, 1991), 126ff., 186ff; idem, *Philosophy in the Renaissance of Islam* (Leiden, 1986), 248ff.

[39] See van Ess, "Disputationspraxis," 26.

[40] Kraemer, *Humanism*, 187.

[41] Ibid., 36; and see the report of the Andalusian scholar Abū 'Abdallāh al-Humaydī who relates that a certain theologian named Abū 'Umar Ahmad b. Muhammad b. Sa'dī visiting Baghdad toward the end of the tenth century found in sessions of Mutakallimūn that there were present Muslims of all sects, and also infidels, Mazdaeans, materialists, atheists, Jews, and Christians, in short, infidels of every sort. See R. Dozy, *Histoire des Musulmans d'Espagne*, new edition, edited by E. Lévi-Provennal (Leiden, 1932), II, 126–7; Kraemer, *Humanism*, 59.

[42] See Larry B. Miller's Princeton, 1984 dissertation, *Islamic Disputation Theory: A Study of the Development of Dialectic in Islam from the Tenth through Fourteenth Centuries*, 42, The notion of *koinai ennoiai* is Stoic, as Miller states (note 90 ad loc.).

[43] The text reads *pros gymnasian*. This is rendered in the translation of E.S. Forster, in the Loeb edition (Cambridge, Mass., 1960), 277, as "mental training."

[44] The breakdown into 3a and 3b is my own.

[45] The translation is from Terence Irwin, *Aristotle's First Principles*, 36–7. Irwin notes (p. 37) that these various purposes are related, and that the third function of dialectic rests on the first two. Alexander, in his commentary on the *Topica*, p. 29. 18–30.12; cited by Irwin, 494, n. 35, considers whether the last function should be subdivided. On the constructive use of dialectic, Irwin cites copious secondary literature, p. 493, n. 40.

[46] The word *jadal* is *Koranic* (18:554), and in Arabic translations of Aristotle, it renders the term *dialektikė* (e.g. *Metaph.* 987b23).

[47] The *Topica* was translated by Athanasius of Balad (d. 696) and by Isḥāq b. Ḥunayn (d. 910) into Syriac. In the tenth century it was translated into Arabic by Abū 'Uthmān al-Dimashqī and others. For details, see F.E. Peters, *Aristoteles Arabus* (Leiden, 1968), 20–3. The translation of al-Dimashqī was published by 'A Badawi from the famous Ms. Paris Bibliothèque Nationale 2346, in *Mantiq Aristū* (Cairo, 1948–52), II, 469–672; III, 675–689. And the eighth book, translated by Ibrāhīm b. 'Abadallāh al-Kātib (from the Syriac of Isḥāq b. Ḥunayn), was published by Badawi in vol. III, 690–733. In the West the Topica became known first through Boethius' *De topicis differentiis* and *De divisione*. It was rendered into Latin in the twelfth century by an anonymous translator.

[48] Ed. 'Ajam, 29–38.

[49] See Zimmermann, Index, 286: *'inād, mu'ānada, ta'ānud*; lxxxiii, n. 3. And see text, 62.9, 21a38 (*antikeintai*), 22a11, 23b30, 211.22ff.
[50] Cf. Alfarabi's discussion of human progress in *Kitāb al-Hurūf* cited above.
[51] That is, the raising of *aporiai*.
[52] See *Republic* 536Dff, and cf. 539Dff.
[53] This phrase was adopted by Maimonides in *Guide*, III, 28 for beliefs necessary for the sake of political welfare, as divine anger and retribution.
[54] See also Ibn Sīnā, *Kitāb al-Shifā', al-Manṭiq, al-Jadal*, ed. I. Madkour (Cairo, 1965), 11–14.
[55] Ed. C.E. Butterworth and A.A. Haridi (Cairo, 1979), Part One, p. 31ff, par. 3–7.
[56] See Butterworth, Introduction, pp. 44–45, and Commentary, Part 3, p. 199, no. 302. He refers (see p. 53, n. 41) to *Topica* 155b3–18.
[57] Ed. and trans. C.E. Butterworth (Albany, 1977).
[58] See *Guide*, II, Introduction; and 2 (pp. 253–4).
[59] Maimonides goes on to say that Alfarabi had great contempt for Galen because he held that this was an obscure question which could not be demonstrated in one way or the other, whereas Abū Naṣr held that the heavens are proven by demonstration to be eternal. The position of Galen is the one that Maimonides himself adopted.
[60] See Georges Vajda, "À propos d'une citation non identifiée d'Al-Fārābi dans le "Guide des égarés," *Journal Asiatique*, 258 (1965), 43–50. Vajda cites Ms. Bratislava TE41, fols 232–33. See ed. 'Ajami, 80–2. The Arabic version, from ed. 'A. Badawi (Cairo, 1949), II, 485, reads *idh hiya 'azīma li-ẓanninā*, which closely followd the Greek at 104b15, whereas Alfarabi has *aw hiya azīma fī ẓanninā*, and Maimonides' text (ed. S. Munk and I. Joel [Jerusalem, 1929]), 203, 1. 15–204.2 reads: *aw hiya 'azīma 'indanā*, thus following the text of Alfarabi (*aw* for *idh*) and making a substitution of *'indanā* for *li-(fi) ẓanninā* of the other texts.
[61] See also Hyman, "Demonstrative, Dialectical and Sophistic Arguments," 48–9.
[62] Hyman, 45–8.
[63] 'Abd al-Laṭīf al-Baghdādī, as cited by Ibn Abī Uṣaybi'a, *'Uyūn al-anbā' fī tabaqat al-aṭibbā'*, ed. N. Rida (Beirut, 1965), 697–9. See B. Lewis, "Jews and Judaism in Arabic Sources (Maimonides)," *Metsudah*, 3–4 (1945), 175–6. A version of the *Guide* in Arabic script apparently existed in Maimonides' lifetime.
[64] Ibn al-'Ibrī, *Ta'rīkh mukhtaṣar al-duwal* (Beirut, 1958), 239. See Lewis, 175.
[65] Ibn Abī Uṣaybi'a, *'Uyūn al-anbā'*, 583. See Lewis, 177.
[66] See J.L. Kraemer, "Maimonides on Aristotle and Scientific Method," *Moses Maimonides and his Time*, ed. E.L. Ormsby (Washington, D.C., 1989), 53–88.
[67] C.H. Lohr, "The Medieval Interpretation of Aristotle," in *The Cambridge History of Later Medieval Philosophy*, ed. N. Kretzmann et al. (Cambridge, 1988), 91. Jonathan Barnes, "Aristotle's Theory of Demonstration," 82–3, breaks these characteristics down to Thera ('hunt'), Skepsis ('inquiry'), Heuresis ('finding'), Zetesis ('seeking').
[68] Lohr, 95–96.
[69] Karl A. Popper, "What is Dialectic," in *Conjectures and Refutations*, 313, n. 4. This was a paper read first at a philosophy seminar at Canterbury University College, Christchurch, New Zealand, in 1937; first published in Mind, N.S. 49, 1940.
[70] A definition of syllogism is given at the beginning of the *Prior Analytics* and *Topics*; and it is employed in the *Sophisticatal Refutations* and appears in the *Rhetoric*. In the *Prior Analytics* (24b18–20) it is said: "A syllogism is a discourse (*logos*) in which, certain things being laid down (*protaseis*), something other than what is laid down follows by necessity on the basis of these things being so." See also *Topica* 100a26; *Sophistica* 165a2; *Rhetorica* 1356b16–17. And see E. Kapp, "Syllogistic," in *Articles on Aristotle 1. Science*, 35, 37, 38, 40. J. Łukasiewicz, *Aristotle's Syllogistic*, 1–12; Jonathan Barnes, "Aristotle's Theory of Demonstration," in *Articles on Aristotle*, 65–66, 68 and n. 15 for references; E. Weil, "The Place of Logic in Aristotle's Thought," 110; Jonathan Lear, *Aristotle and Logical Theory*, 1–14.
[71] That is, a demonstrative argument rests on principles that are true, necessary and universal, immediate; and they also explain the conclusion that must also be true, necessary and universal.
[72] See Barnes, "Aristotle's Theory," 69ff., where Aristotle's possible influence of Euclid is discussed; Heath, *Euclid's Elements*, I, 117–24, and especially 120–121 on common opinions.
[73] Barnes, p. 73.
[74] Kapp, "Syllogistic," 41–42; Barnes, 77, and n. 63, 79–80, 83; cf. Heath, *Elements*, I, 120–121. And see Weil, "The Place of Logic," p. 98, 107 (4).
[75] Nussbaum, "Saving Aristotle's Appearances," 252ff.
[76] That is, of believing in the denial of the Principle of Non-Contradiction.
[77] Nussbaum, 255.

Y. TZVI LANGERMANN

MAIMONIDES' REPUDIATION OF ASTROLOGY

INTRODUCTION

One of the most celebrated opinions of Maimonides is his repudiation of astrology. His denunciation of that pseudo-science, reiterated in the strongest of language throughout the Maimonidean corpus, has earned for its author the praises of modern readers who are impressed by Maimonides' courage and clearsightedness in the face of a widespread and deeply rooted superstition. Moreover, in contrast to such topics as cosmogony and epistemology, in which there exists some ambiguity about Maimonides' opinion, there does not seem to be any doubt about his "true" position concerning astrology: astrology is categorically rejected without any reservation.

Some of the practical consequences of the pursuit of astrology by Jews were stated quite clearly by Maimonides in his *Letter on Astrology*:

> This is why our kingdom was lost and our Temple was destroyed and why we were brought to this; for our fathers sinned and are no more because they found many books dealing with these themes of the stargazers ... They did not busy themselves with the art of war or with the conquest of lands, but imagined that those [astrological] studies would help them.[1]

The same line of argument is evident from the context of Maimonides' criticism of astrology in other works as well. In the *Mishneh Torah*, exhortations not to succumb to the numbing embrace of fatalism are conjoined with denunciation of astrology.[2] In the *Epistle to Yemen* Maimonides encourages his coreligionists by telling them that, contrary to astrological predictions, the Jews shall yet be redeemed from their present lowly political fortunes:

> For while the Gentiles believe that our nation will never constitute an independent state, nor will they [our nation] ever rise above their present condition, and all the astrologers, diviners, and augurs concur in this opinion, God will prove false their views and beliefs, and will order the advent of the Messiah ... This is the correct view that every Israelite should hold, without paying any attention to the conjunctions of the stars.[3]

Maimonides' intent is clear and straightforward, and I shall not elaborate here upon this aspect of his repudiation of astrology.

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 131–157.
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On the other hand, it seems that there is much to be gained from a more detailed look at the scientific and philosophical dimensions of Maimonides' position. How is his religious posture related to his scientific outlook? Why does he make so much of events of the distant past, when astrology played a key role in the retreat from monotheism? Are there any subtler connections between the belief in astrology and the denial of free will? Finally, and from a broader perspective, the medieval debates concerning astrology, in which Muslim, Christian, and Jewish proponents as well as opponents participated, served to focus serious discussion on questions of epistemology, philosophy of science, metaphysics, and similar topics.[4] In this paper I can sample only a very small part of this rich repository of intellectual history. Nevertheless, by looking at Maimonides' positions in some depth, and by offering some comparison with the views of others, I hope to provide some insight into Maimonides' philosophy and, at the same time, to demonstrate the importance of the literature connected with astrology for the history of medieval science and philosophy.[5]

According to his own testimony, astrology was the first subject which the young Maimonides studied.[6] Indeed, there is some indication that his father, Maimon, had no particular reservations concerning astrology and, in fact, knew something about the subject.[7] It is thus quite possible that Maimonides received his first instruction at home. But there was also opposition to astrology. The fact that Abraham bar Ḥiyya was compelled to rally to the defense of astrology presents clear proof that Spanish Jewry counted among its members some staunch opponents of astrology, people who, as we may discern from Bar Ḥiyya's counterarguments, made no distinction between the "science" of astrology and the "Chaldean" sorcery condemned by the Talmud.[8] Baḥya ibn Paquda also rejected astrology.[9] Nevertheless, it seems that in the twelfth century astrology enjoyed wide acceptance among Spanish Jewry. Abraham ibn Ezra was particularly successful in integrating astrological ideas into Jewish thought.[10] Although from time to time doubts about astrology may have been expressed, there was no full-scale attack on it until the publication, under very different historical circumstances, of Isaac Pulgar's *Defense of the Faith (Ezer ha-Dat)* in the fourteenth century.[11] Evidence which has recently been assembled from the Genizah indicates that in Egypt also, at about the time that Maimonides settled in that country, astrology was firmly established both as common belief and as a profession.[12] Maimonides' correspondents in the Provence displayed a keen interest in astrology, and those in Yemen seemed to have already been infected with it. Thus belief in astrology appears to have been widespread throughout the Jewish world as Maimonides knew it.

Maimonides' opposition to astrology is unwavering, from his youthful *Commentary on the Mishnah* through his mature *Guide of the Perplexed*. In this paper I shall deal with Maimonides' classification of astrologers and his chief arguments against them; the scientific objections to astrology; the proper understanding of the "influence" of the stars; the connections between astrology and idolatry; and, finally, fate and free will.

CLASSIFICATION AND SUMMARY OF THE OBJECTIONS TO ASTROLOGY

Maimonides' primary objection to astrology arises from the *scientific* falsehood of that art. In his view, there is and there must be a total identity between religious truth, that is, the truths taken as fundaments of belief of the religious community, and the truths discovered by dispassionate scientific or philosophic investigation. Whatever other motives may lie behind biblical injunctions, we can be sure that astrology and astrological practices were prohibited by the Torah, *because* they are false. Astrological forecasting is included in the list of superstitious practices prohibited in Deuteronomy not only to deter Jews from practicing allegedly effacious techniques, but, rather to eradicate beliefs that are false and are delusive:

> Whoever believes in these and similar things [astrology, sorcery] and thinks in his heart that they are true and scientific and only forbidden by the Torah is nothing but a fool, deficient in understanding ... Sensible people, however, who possess sound mental faculties know by clear proofs that all of these practices which the Torah prohibited have no scientific basis but are chimerical and inane; and that only those deficient in knowledge are attracted to these follies and, for their sake, leave the ways of the truth.[13]

It is not just the practice of astrology or sorcery which is prohibited, but it is also forbidden to believe that such practices are in any way capable of achieving the results that they promise. These particular forms of nonsense may have received special attention in the Law because of their historical and ideational links with paganism, as we shall see. Generally, though, the various forms of prognostication and sorcery, among which Maimonides classifies astrology, are banned *because* they are false. To put the matter in another way (particularly relevant for later developments in Jewish thought), there is no cosmic struggle between the deity and the various "forces of evil"; instead, we may speak of a campaign of truth (note that the Arabic *al-Ḥaqq*, whose literal meaning is "the Truth," is synonymous with God) against all forms of falsehood, in the sense of vain, empty beliefs. On this fundamental theological question, Abraham ibn Ezra – commonly portrayed as Maimonides' archrival on the subject of astrology – is in full agreement with Maimonides. In his commentary on Leviticus 19:31, Ibn Ezra bitingly remarks: "Empty-brained [people] have said that, were the auguries and other forms of sorcery not true, Scripture would not have banned them. I maintain the opposite viewpoint: Scripture has banned falsehood, not truth. Witness the false gods and idols [which are also banned]."

It seems, then, that the very different attitudes taken by Maimonides and Ibn Ezra toward astrology stem in large measure from their different assessments of the scientific worth of that art. Each of these thinkers succeeded so well in intregrating his position on astrology into his overall philosophy that it may appear that philosophical or theological considerations by themselves dictated their differing stances toward astrology. However, the scientific issues were no

less weighty, especially given the commitment of these two thinkers to a single truth theory. The contemporaneous scientific evidence and philosophical currents furnished support for both points of view. On the other hand, the fierce polemical tone of the remarks which we have just quoted shows that both Maimonides and Ibn Ezra felt the need to combat the view, seemingly widespread and entrenched, that sorcery was efficacious and, therefore, that other reasons must be sought for its prohitition in the Jewish tradition. It remains a matter for further study whether augury and the like was just a matter of popular superstition, or whether the belief in such practices had been incorporated into any wider intellectual framework. By the thirteenth century, however, when the Maimonidean controversy was in full force, the view diametrically opposed to Maimonides and Ibn Ezra had received a theoretical formulation. In response to an inquiry concerning the legality of applying astral magic to medicine, R. Solomon ben Adret, a resident of Montpellier, wrote: "Someone who makes an image at a specific hour, even for the purpose of therapy, transgresses [the biblical injunction] 'You shall not foretell (*lo t''onninu*).' For the Torah has not forbidden anything *unless it has some basis ('iqqar)*, such that one may err."[14] Ben Adret immediately informs his correspondent that Maimonides has expressed exactly the opposite opinion.

The second main theme of Maimonides' repudiation of astrology concerns the link – the organic and insoluble link, in Maimonides' opinion – joining astrology to star worship. This clearly represents an enlargement upon an aspect of the first theme, that is, the identification of astrology with falsehood, since star worship is in itself a form of falsehood. One may, perhaps, wish to see Maimonides' strong emphasis on the link between astrology and star worship as being, in large part, a tactical move. Jewish thinkers are, of course, unanimous in viewing star worship as a forbidden practice, and, it would seem, they would agree that star worship is vain and foolish as well. Moreover, the accusation that astrology is but a thinly disguised form of star worship figured in early religious polemics against astrology.[15] Nevertheless, it seems that Maimonides is careful not to state that, legally speaking, the practice of astrology constitutes an act of idolatry. Instead he stresses two points: the *historical* connection between astrology and idolatry; and the errors of physics and metaphysics which have in the past contributed to this connection, and whose danger remains everpresent.

The historical connection is presented most lucidly and succinctly in the opening chapters of the *Laws Concerning Idolatry and the Ordinances of the Heathens*. According to this account, Enosh and his generation committed a fundamental error: they inferred from the correct statement that the heavens are among the most noble of God's creations, the incorrect conclusion that it is God's wish that His highest officials, so to speak, should be the objects of veneration. From this mistaken view ensued a whole cult of the stars, including, especially, an avaricious and deceitful priesthood. Abraham, by dint of his own speculation and investigation, rediscovered the one God, was rewarded with prophetic revelation, and founded the people whose chief unifying characteristic is monotheism. This story is retold in part 3 of the *Guide*, especially

chapter 37.[16] Maimonides there shares with his readers the results of some of his own historical research, most importantly information which he had culled from Ibn Waḥshiyyah's *Nabatean Agriculture (al-Filâḥah al-nabaṭiyyah).*[17]

There is a wider perspective to Maimonides' understanding of this series of historical events. In order to appreciate this, we must first sketch the story subsequent to Abraham.[18] Abraham's followers built themselves into a substantial group, but during the Egyptian bondage most reverted to idolatry. Then, in truly miraculous fashion, Moses came upon the scene, and at Sinai an eternal covenant was sealed. Most significant is the constant retreat of idolatry ever since: classical paganism, to Maimonides' knowledge, had become limited by his time to a few areas at the fringes of civilization or beyond. Whatever errors may beset Islam and Christianity, both of these faiths honor Abraham and have at least some acquaintance with the teachings of Judaism. In the messianic era the spread of monotheism will be completed, and humanity will return in some sense, to the pristine state which it enjoyed before the error of Enosh and his generation. Human history can thus be understood as a retreat from, and a return to, monotheism. Astrology played a critical role in the introduction of paganism, and its expurgation is crucial for the return to monotheism.

Although the action of Enosh is portrayed in the *Mishneh Torah* as a simple error of reasoning, an examination of several key chapters of the *Guide* reveals that some rather subtle errors of physics and metaphysics lie at the heart of astrology and the religious doctrines associated with it. I shall examine these issues in detail later on. For now suffice it to say that Maimonides, in concert with just about every other medieval thinker, does admit of some *physical* i.e. corporeal or mechanical, astral influences. At the same time his attitude also involves a considerable diminution in the role of the celestial intelligences.

The third consideration in the campaign against astrology derives from Maimonides' clear insistence upon man's absolute freedom of action. Now since antiquity astrology has been associated with some form of determinism; the regular and predictable – and therefore, it appeared, predetermined – motions of the stars were thought to be connected to an equally predetermined, if somewhat less orderly, sequence of events on earth. There was room for more than one point of view concerning the nature of this connection. Are the stars the causes of events on earth, or are they merely convenient indicators? Is the influence of the stars of a general sort, thus leaving some latitude for human action, or is their determination absolute? To what level of detail do the stellar influences operate?

Judaism rejects fatalism, and the need to defend some freedom of the will presents the most serious obstacle for Jewish adherents of astrology. Maimonides emphasizes the connection between astrology and fatalism in the fifth chapter of the *Laws of Repentance*:

> If God had decreed that a person should be either righteous or wicked, or if there were some force inherent in his nature which irresistably drew him to a particular course, or to a special branch of knowledge, to special views of

> activities, as the foolish astrologers out of their own fancy pretend, how could the Almighty have charged us through the prophets, "Do this and do not do that, improve your ways, do not follow wicked impulses . . .?"[19]

These remarks notwithstanding, free will is the one issue connected with astrology concerning which Maimonides *has* been suspected of maintaining an esoteric position quite different from the opinion openly proclaimed in the *Mishneh Torah*, namely that man has free choice.[20] I do not propose to offer a full and satisfactory explanation of Maimonides' view on this question. However, I shall try to refine our understanding of Maimonides' position, and shall also call attention to a possible additional source for his views. The posture adopted in the *Mishneh Torah* will thus appear more philosophically sophisticated, and less of an exhortation to the masses.

THE SCIENTIFIC DEBATE

Maimonides' firm conviction that astrology is, on strictly scientific grounds, demonstrably false, was a compelling factor in his *religious* campaign against the art. Yet, while medieval literature contains some detailed scientific refutations of astrology, Maimonides, surprisingly, offers little in the way of counterargument. Perhaps he felt that serious rebuttal would itself imply that there was, after all, *some* case to be made in defense of astrology. Maimonides' only straightforward scientific criticism is found in his *Commentary on the Mishnah*, Avodah Zarah 4.7.[21] There he presents what seems to be a common argument against astrology.[22] It is known, this argument goes, that each celestial sphere is a single, homogeneous unchanging body. But astrological theory is based upon two other principles: (a) that some stars are beneficient and others maleficent, and (b) to the different stars there correspond points on the celestial sphere that are conducive to each of the stars. These two principles of the astrologers clearly contradict the doctrine of the homogeneous sphere and with this contradiction, the entire edifice of astrological theory is demolished.

> These two principles constitute the axis of astrology. Their falsity has been demonstrated and, consequently, every last detail [of astrology is also refuted].

However, towards the end of *Guide* 2.19,[23] the nonuniformity of the sphere is adduced as compelling evidence for creation of the world by the divine will. This may possibly be the reason that this particular argument against astrology does not recur in the *Guide*.

The most significant complaint against the astrologers, found in the *Guide*, concerns the proper understanding and usage of the term *fayḍ* (We shall here limit ourselves to the scientific side of Maimonides' argument; the ramifications for metaphysics will be discussed later on.) In *Guide* 2.12, we are told that the fundamental error which leads to astrology consists, in the first instance, in a confusion of terminology. The influence of the stars – including the physical

agency acknowledged by Maimonides – is often called an efflux or overflow (*fayḍ*). Maimonides himself frequently employs *fayḍ* to describe the actions of the stars.[24] Strictly speaking, this is incorrect. According to Maimonides, the stars exert their influence by means of forces or powers (*quwwât*), which obey the rules of physics. These forces require a finite period of time to take effect, and they weaken over distance. Efflux, on the other hand, is instantaneous, and relations of distance between the source and the object on which it acts are irrelevant. Moreover, efflux is unceasing; all that is required for it to take effect is the proper preparedness (*tahayya'*) of the recipient. Because of its non-corporeal nature, the efflux itself cannot be perceived, only its effect. "Everything that is produced anew, but does not result solely from the mixture of elements itself (*mizâj*)"[25] has been brought about by the efflux.

In this manner the efflux is distinguished from corporeal forces and, in particular, the astral forces. Although, as we shall see, there are some difficulties in understanding just how the astral forces operate, Maimonides is sure that enough is known about their properties that they may be classified as corporeal. After all, it can be determined that a poorly understood terrestrial force such as magnetism is corporeal, because we note that its power diminishes over distance – a property of bodily forces, not of efflux. Similarly, the fact that the stellar influences also depend on the varying distances of the stars from the earth is sufficient evidence to prove that their effect is due to the action of bodies one upon the other, *not* an efflux. Maimonides maintains that the astral forces obey the laws of physics, specifically, that their power depends on the variables of distance from the center of the world and "relation one to another" (*nisbatu ba'ḍihâ li-ba'ḍin*). The latter phrase, S. Pines notes, must refer to some spatial relationship which exists between the stars.[26] Now the geocentric interstellar angles are, indeed, the very consideration which underlies the astrological doctrine of "aspects"; but this notion too admits of a physical interpretation, since what is of concern is the interacting mixture of stellar rays which reaches the earth, the nature of which is thought to be connected to the angular distance separating the stars.[27]

Maimonides does not substantiate this critical point in any detail; he merely presents as a known fact that all of the stellar influences can be explained in terms of the action of bodies upon one another.[28] Moreover, the impact of this argument depends entirely on the principle that the stars are to be viewed exclusively as corporeal entities and their influence analyzed in terms of Aristotelian terrestrial physics. Maimonides does not take into account the possibility that the astrologers may have adopted, in part or as a whole, non-Aristotelian physical theories which ought to be considered on their own terms, much like the atomism of the Mutakallimûn.[29] In other words, the astrologers' conception of *fayḍ* may not have been due to a misunderstanding, but to the deliberate appropriation of this term for use within the context of their own (non-Aristotelian) theories. Perhaps Maimonides was aware of the theoretical difficulties inherent in any attempt to explain the effects of the stars on earth in terms of the Aristotelian system; I shall elaborate upon this point in the next section.

In large measure, the claims of the astrologers were based on induction from the empirically evident effects of the sun and the moon. Extending their observations in the case of these two celestial bodies, the astrologers asserted that the other stars, and certain mathematical points or arcs on the celestial orb, also exert an influence, albeit one which is weaker and less readily detectable. The difficulty or inability of the opponents of astrology to provide a cogent account of the acknowledged influences of the sun and the moon – one which would exclude the more fanciful claims of the astrologers – may have detracted from the force of their denial of the influences that the astrologers inferred regarding the other stars and mathematical points on the celestial sphere. Given the paucity of his own doctrine in all that concerns the explanation of the legitimate stellar influences, there was little that Maimonides could offer in terms of detailed rebuttal of the suggestions of the astrologers. Maimonides elsewhere insists that the Aristotelian sublunar physics is perfectly correct,[30] and whatever else may have prompted that remark, it is possible that he also felt that an important argument against astrology hinged on the soundness of Aristotelian physics. In any event, the chief implications of the attribution of *fayḍ* to the stars are to be found in the realm of theology, and we shall have more to say on this matter in a later section of this paper.

Issues of epistemology and philosophy of science are also involved in Maimonides' refusal to regard astrology as a legitimate science. Astrologers assert that observation and experience have indicated that certain celestial configurations are conjoined with certain terrestrial events. Predications which have been made on the basis of the accumulated data have had a reasonable degree of success. Therefore, the astrologers would content, astrology is a legitimate science, even if it cannot offer any logically demonstrable explanation of the connection between stellar patterns and earthly events.[31] Maimonides aligns himself squarely with that school of thought which denies that science can be based solely upon what we would call inductive reasoning based upon repeated experience (*tajriba*, plural *tajârib*,).[32] It seems that Maimonides derives in large measure his conception of what a physical theory *should* be from the thought of Alexander of Aphrodisias.[33] According to this view, the first principles of a physical theory are undemonstrable and must come from observation. However, science is not just an agglomeration of observations, or what are claimed to be observations. A formal scientific theory must be logically constructed upon these first principles. Maimonides is quite insistent in his demand that a scientific theory provide some causal account of the phenomena, especially with regard to efficient causes, and that this account have the rigor of formal, logical demonstration. Yet the astrological method which we shall describe presently contains no formal proofs and identifies no efficient causes. According to that method, each individual datum is acquired by matching a product of the imagination (*khiyâl*) with what is claimed to be repeated empirical confirmation. Maimonides is particularly vigorous in his criticism of those who rely upon the imaginative faculty for the elucidation of such sublime matters and, in fact, a strong denunciation of this method is

conjoined to his discussion of the errors which led to astrology in *Guide* 2.12.[34]

A clear statement of the epistemological approach of the astrologers, in which *tajriba* plays the key corroborating role, is found in a text attributed to Adam and quoted by Ibn Waḥshiyyah in his Nabatean Agriculture (*al-Filâḥa al-Nabaṭiyya*),[35] which work Maimonides calls "the most important book about this subject [astrology]."[36] According to this text, the first step toward knowledge of the stellar influences is a divine revelation (*'ilhâm*). The recipient next applies reason (*qiyâs*) to this revelation until he arrives at some product of the imagination (*khiyâl*). Apparently the role of *qiyâs* is to process the revelation into some type of image which can be checked against the appearances in the sensory world. The last step is corroboration by means of *tajriba*, repeated testimony that the imagined stellar influence is in fact a true one. Ibn Waḥshiyyah strongly indicates that of these four steps, the two most important are *qiyâs* and *tajriba*, and that it is the latter which leads to sound knowledge. Now clearly not all astrologers would have fully accepted this theory of knowledge. Some, such as Abû Ma'shar, were cognizant of some of the objections which had been raised against their art, and made some attempt at accommodation.[37] Others, such as Abraham bar Hiyya, acknowledged that astrology's reliance upon experience (*nisayon*) made it less certain that the demonstrative sciences.[38] A survey of the full range of this epistemological debate is well beyond the purview of this paper. Nevertheless, it seems to be generally true that astrology was an inductive science, possessing little in the way of explanation by means of efficient causes and relying heavily on what it claimed to be empirical verification of the various relationships between heaven and earth.

Al-Fârâbî, to whose views Maimonides showed some affinity in his philosophical outlook, dismisses out of hand the claim that *tajârib* prove that the sun signifies for kings, Mercury for notaries, and other such pretenses of the astrologers. Anyone who investigates the various assertions which are made concerning nativities, interrogations, etc., will find that they may equally turn out to be correct or incorrect. In short, astrology is mere guesswork.[39]

Maimonides does not address the epistemological question in the context of astrology. However, he does state his own views on this question in a medical context in the eleventh chapter of his *Treatise on Asthma*.

> Therefore those who rely on experience (*'ahl al-tajriba*) lack logical reasoning (*qiyâs*) and err. For sometimes things work out for them, and sometimes not. I therefore state: he who submits himself to a physician who has experience but does not understand the rules of logical reasoning is like someone setting out to sea who submits himself to the blowing of the winds. For they [the winds] do not proceed according to reasoning; sometimes they blow in accordance with the wish of the seafarer and in line with his purpose, and sometimes they [lead to] his drowning and the denial [of his purpose]. I have called this to your attention because many people perish as a result of [treatment which is based solely] on experience. It is by chance that one survives or perishes from [that type of treatment].[40]

Maimonides carried out this philosophy in his own medical practice, as he reveals in a letter to his disciple, Joseph ben Judah:

> When I come [home] to Fustât, the most that I can do during what is left of the day and the night is to study that which I may need [to know] from the medical books. For you know how long and difficult this art is for someone who is conscientious and fastidious, and who does not wish to say anything without first knowing its proof, its source [in the literature], and the type of reasoning (*wajh al-qiyâs*) [involved].[41]

The assessment of *tajriba* forms one of the philosophical questions which are seriously debated in the polemical literature concerned with astrology. We have sketched briefly the views of a few thinkers; the issues involved are more complex. Opponents of astrology usually questioned not only the method, but also the *quality* of the evidence presented by the astrologers. And even if the opponents granted the truthfulness of their observations, they remained doubtful that the astrologers had accumulated *enough* evidence to substantiate their claims, for it is well known that the same astrological configuration recurs rarely if at all.[42] Medieval scientists had no well-developed understanding of statistics, and the arguments on both sides accordingly were usually limited to statements of a broad generality. Of course, one proof for the correctness of astrology could come from successful predictions made on the basis of the empirical data. But this too offers no path to full resolution of the matter. Astrologers often admitted that they were not as accurate as they might be. Maimonides notes this admission to which he adds, "one astrologer is superior to another only in sofar as the former's falsehoods are less than those of the latter; but it is impossible that even he may be correct with regard to all of the details."[43] However, it is and always will be moot whether a poor record of prediction indicates a worthless theory (as the opponents claim) or, instead, points only to the need for further technical refinements (as the astrologers claim).

Let us return to Maimonides. Despite his rather categorical rejection of *tajriba*, Maimonides, in the face of troublesome talmudic sources, manages to find some slight justificationn for this mode of inference in the field of medicine. The Talmud lists some seemingly superstitious practices which are nevertheless permitted because of their supposed therapeutic value. As a general rule, the Talmud states: "In matters of healing there is no [prohibition of] 'the ways of the Emorites.'"[44] In characteristic fashion, Maimonides (*Guide* 4.37) interprets the phrase "matters of healing" to mean "that which natural reasoning requires [for treatment]."[45] Nevertheless, the use of a nail from a cross or of a fox's tooth – practices which, while lacking any medical rationale, are specifically condoned by the Talmud – are allowed because "in those times these things were considered to derive from experience."[46] Both as physician and as theologian, Maimonides clearly disapproved of these cures, yet he does not reject out of hand a talmudic passage which sanctions them.

In contrast to his tolerance of questionable medical practices which have

found a place within Jewish lore, Maimonides absolutely denies that astrology has any support from the traditional sources. This is itself noteworthy, for it does seem to be Maimonides' habit to find support for more than one point of view with regard to those issues concerning which there is room, in his opinion, for legitimate disagreement or, at least, where the opinion rejected by Maimonides is not necessarily to be deemed heretical. An example (which may prove germane to our topic) is provided in *Guide* 2.8, where Maimonides asserts that the Pythagorean theory that the celestial motions produce harmonious sounds, which had been rejected by Aristotle, did have adherents among the ancient Jewish sages. But nowhere does Maimonides find any such support for astrology. As a matter of fact, Maimonides' most forceful and explicit rejection of a Talmudic source is found in his *Letter on Astrology.*

> I know that you may search and find sayings of some individual sages in the Talmud and Midrashim whose words appear to maintain that at the moment of a man's birth, the stars will cause such and such to happen to him. Do not regard this as a difficulty, for it is not fitting for a man to abandon the prevailing law and raise once again the counterarguments and replies [that preceded its enactment]. Similarly it is not proper to abandon matters of reason that have already been verified by proofs, shake loose of them, and depend on the words of a single one of the sages from whom possibly the matter was hidden.[47]

Finally, we should take note of a stock argument against astrology which Maimonides does *not* cite. Sine antiquity, opponents of astrology have made much of mass disasters, for example, shipwrecks. How can it be that a large number of individuals, each of whom was born under a different astral configuration, were all fated to perish together, in the same place and at the same time?[48] It is not by chance that Maimonides avoids this type of argument. For the very example of the shipwreck appears in Maimonides' discussion of divine providence. According to Maimonides, the disaster itself may constitute a chance happening, as the opponents of astrology would also urge, but it was divine providence, in accordance with absolute Justice, that determined *who* would be on that ship.[49]

ALLOWABLE INFLUENCES OF THE STARS

1. The astral forces

The most important point to be made about the astral forces is that, in Maimonides' system, the stars exert their influence only as bodies acting upon other bodies. Statements to this effect may be found in the three most important discussions of the astral influences, namely, *Guide* 1.72, 2.10, and 2.12.[50] Those forces that originate in the heavens must be traced to the celestial *bodies.* On the other hand, the fanciful figures, or beings which the human imagination has associated with the stars and their conglomerations, such as

the Fish, the Ram, the Ox etc., are scornfully dismissed.[51] Similarly, there can be no role in the operation of the cosmos for the ascendant, the houses, and other such fictions. Maimonides' strict insistence that bodies alone exert influence on other bodies has, as we shall see, some connection to the metaphysical aspect of his rejection of astrology. Nevertheless, his position on this point is, on the face of it, based strictly on considerations of Aristotelian physics. Bodies alone can set other bodies in motion. In this regard Maimonides' rejection of astrology is consistent with his criticisms of the Ptolemaic system in *Guide* 2.24. There too, in a completely nonastrological context, Maimonides disallows the notion that imaginary points, such as the eccenter, play any role in the physical workings of the universe.[52]

The mode by which these corporeal forces associated with the stars are produced and transmitted is by no means clear. As a matter of fact, this entire issue involves a conundrum of Aristotelian science which, fortunately for Maimonides and those of his trend of thought, does not seem to have been the subject of much criticism during the Middle Ages. For it is indeed quite difficult to explain how, within the framework of Aristotelian science, a celestial body actually brings about its supposed effect on the earth.

These difficulties can perhaps best be appreciated by looking at the most obvious of all astral effects, a stellar "influence" so obvious and pervasive that it had to be confronted by all those who professed an interest in natural science, namely, the heating effect of the sun.[53] How is this to be accounted for? In Aristotelian cosmology the sun, like the rest of the heavens, is made up of the fifth element, the aether, and thus has no share in the terrestrial element of fire nor in the terrestrial quality of heat.[54] It should also be noted that Aristotle does not allow action at a distance; all forces must be transmitted mechanically, by one body which actually touches another.[55] Finally, Aristotle maintains that one body may actualize a potentiality in another only if the first contains, at least *in potentia*, the quality which is being actualized in the second.[56]

Aristotle attributed the sun's heat to its motion.[57] Later commentators, and in particular the Andalusian philosophers Ibn Bâjja and Ibn Rushd, also listed the sun's light as a factor; the idea must go back much earlier.[58] The connection between sunlight and heat is not merely intuitive; "burning" parabolic mirrors, the subject of much investigation by classical scientists, can focus enought sunlight to ignite a flame. In *Guide* 1.72, Maimonides presents a variation of Aristotle's assertion that the sun's ability to produce heat was due to its forcing downward, by means of its motion, the element of fire. Maimonides states more generally that the motion of the celestial orb as a whole forces downward the two lighter elements, fire and air, thus inducing a constant mixing of all the elements.[59] In *Guide* 2.10, he states that the sun's rays set in motion the element of fire.[60]

These two factors – motion and luminescence – were extended to the other celestial bodies as well and seem to have formed the principal elements of the scientific explanation, such as it was, of the effects of the stars. Both of these explanations are found in Maimonides, who seems to have assigned a specific

function to each one. Two chief tasks which are carried out by the celestial bodies are identified in *Guide* 2.10: generation and preservation.[61] Light is named in *Guide* 2.5, as the proximate cause of generation and corruption.[62] This notion is spelled out more fully in *Guide* 1.72, where we are informed that the heavens transmit four forces or "souls," one each for the four classes of terrestrial beings: mineral, vegetable, animal, and human. The role of motions – *pace* Aristotle – appears to be limited to preservation (*hirâsa*). By preservation Maimonides means that the life of the cosmos depends upon the unceasing motion of the heavenly orb.[63] In the long chapter on cosmogony a somewhat different account is presented. The chief causes of generation and corruption are said to be, first of all, "the forces of the sphere," and, second, light and darkness; furthermore, "the elements intermix in consequences of the motion of the sphere, and their combinations vary because of light and darkness."[64]

Maimonides' account of the operation of the stellar forces does not go much beyond the naming of these two factors, that is, motion and luminescence. It seems that, generally speaking, such debate as there was concerning the causes of these universally acknowledged astral actions devolved upon the choice between the light of the stars or the motions of the orb as the conveying force. Indeed, Judah ha-Levi bluntly states that the claim of the astrologers to know the details of the operation of the stellar forces is utterly false.[65] Al-Fârâbî clearly states that celestial influences are to attributed solely to luminescence.[66] Ibn Sînâ notes – and rejects – the view of an anonymous writer that the motions of the orb alone can account for the generation of the terrestrial elements; this opinion may be due to one of the orthodox Aristotelians of Baghdad.[67] Interestingly enough, Levi ben Gerson, who embraced astrology, also asserted that the stars exert their influence by means of their luminescence.[68] Faced with the difficulties which we have listed above, it is perhaps not surprising that medieval thinkers – both defenders and critics of astrology – limited their remarks to generalities. The excavation of these speculations, including some possible appeals to non-Aristotelian ideas for help, remains a subject for further research.

2. OTHER UNDERLYING COSMOLOGICAL THEMES

In the preceding section we have seen how, by and large, Maimonides tried to account for the astral forces within an Aristotelian framework. Some non-Aristotelian currents as well figure prominently in Maimonides' presentation. The two most important of these are the concept of the cosmos as a single living being and certain fascination with the number 4.

In Guide 1.72, Maimonides states that the idea of the cosmos forming one ensouled being is an important element of the proof for the unity of God.[69] The concept that the heavens constitute, in fact, a single celestial animal is originally Stoic.[70] It is worth noting that Maimonides accepts, on the basis of the notion that the cosmos forms a single entity (*shakhs*), the idea that specific stars have capabilities over specific classes of terrestrial beings. Although it appears that Maimonides intends nothing beyond his own discovery (see

below) of the pairings between the celestial bodies and the terrestrial elements, the plain sense of his remarks does point to a wider interpretation, namely, that individual stars have special relationships with the particular species of vegetation and other terrestrial beings.[71]

The notion that the cosmos constitutes one living being lends particular appeal to the idea that man is a microcosm, a being whose structure and composition mirrors that of the world as a whole. The most alluring concepts associated with this analogy concern the spiritual element found in both cosmos and man – life force, soul, and/or intellect. The most important source for this idea in the Arabic literature is to be found in the *Epistles* of the Ikhwân al-Safâ' (Brethren of Purity). Many of the prominent Hispano-Jewish thinkers of the eleventh and early twelfth centuries, such as Solomon ibn Gabirol, Judah ha-Levi, Abraham ibn Ezra, and Joseph ibn Ẓadiq had already incorporated the macrocosm/microcosm analogy as a major theme of their thought.[72]

Clearly, the theme of macrocosm/microcosm had struck deep roots in Jewish thought, and Maimonides felt the need to clarify its meaning and significance in some detail. The simile is explicated at some length in *Guide* 1.72.[73] Particularly enlightening for our topic are the three points at which, Maimonides insists, the analogy breaks down. These are: (1) In the microcosm the relationship between the governing organ, that is, the heart, and the other organs, is *mutually* beneficial, for the heart receives some benefits from the other organs. However, in the macrocosm, the celestial orbs, which are the analogue of the heart, neither expect nor receive any benefits from the sublunar sphere. (2) In the microcosm the heart, which is the noblest part, is located at the center, whereas in the macrocosm the basest part, the earth, is at the center, and the more distant a part is from the center, the more noble it is. (3) The human intellectual capacity is inseparable from the body, whereas God is utterly transcendent. All of these clearly point to the type of theological errors which, as we shall see, Maimonides associates with astrology. Thus the first point illustrates the futility of any attempt to propitiate or otherwise influence astral bodies. The second point, it seems, aims to devalue any special role to be accorded the sun, which was especially glorified in the astral religions and associated philosophies because of its central and apparently dominant placement in the configuration of the heavens.[74] The third point is a direct rebuttal of the Sabaean belief that the divinity is the "spirit of the orb" (*rûḥ al-falak*).[75]

Somewhat unusual in this whole scheme is Maimonides' fascination with the number 4, particularly within the realm of natural science. This matter is adumbrated in Guide 1.70, where Maimonides takes some trouble to prove that Joseph's chariot (Gen. 46:29 and 41:43) and Pharaoh's chariots (Exod. 15:4) were drawn by four horses.[76] In those matters which, so to speak, are germane to the cosmic chariot, tetrads appear repeatedly: four causes of orbital motion are listed in *Guide* 2.10,[77] and in *Guide* 1.72, four types of astral forces are matched to four classes of terrestrial beings.[78] Most striking, though, is Maimonides' self-proclaimed discovery of an additional and highly significant correspondence. If the five planets (Mercury, Venus, Mars, Jupiter, Saturn) are

treated as a unit, that is, as a distinct class of star, then we have four sets of celestial bodies: the moon, the sun, the planets, and the fixed stars. These can then be linked to the four terrestrial elements: the moon to water and the sun to fire (these are standard astrological correspondences); the planets, whose proper motion is relatively quick, to the air; and the fixed stars, whose motion (here precession is intended) is slow, to the earth. In his letter to Samuel ibn Tibbon, Maimonides brushes aside the writings of Pythagoras.[79] Thus this Pythagorean train of thought seems quite out of character with Maimonides.[80]

ASTROLOGY AND STAR WORSHIP

We have already presented Maimonides' reconstruction of the emergence of star-worship. Few of Maimonides' contemporaries would dispute the existence of *some* historical linkage between astrology and star-worship;[81] the crucial question is the necessity of that connection. Is the connection between the two so inextricable, so organic, that astrology will inevitably lead to star-worship and deserves, therefore, to be regarded as an auxillary of it? Maimonides answers this question in the affirmative, and it seems that two trains of thought lead up to his reply.

The first consideration, which is based on human nature (or psychology, in the modern, popular sense of the term), is revealed in Guide 3.37. In his explication of the rationale underlying the second group (in his own classification) of biblical commandments, namely those whose aim is to counteract idolatrous beliefs and practices, Maimonides establishes a causal chain beginning with theurgical or magical practices and leading, through astrology, to full blown star-worship. Magical practices were, by and large, aimed at bettering one's material well-being and, especially, at warding off any perceived dangers. In what is one of the most penetrating insights into human nature found in the *Guide*, Maimonides explains how foolish and ineffective magical practices managed to take such a deep hold on so many people. Heathen preachers advertised widely that whosoever did not follow a particular ritual (of their own devising) would sustain some loss. Eventually it happened that, by chance, someone who ignored these exhortations did suffer, and out of deep seated human fears, the many instances in which no harm ensued from ignoring the ritual were overlooked, and that particular practice entrenched itself.[82]

Now many magical practices are carried out at specific times which are chosen for their astrological significance. Building upon this, Maimonides proposes a sweeping generalization: "In all magical operations it is indispensable that the stars should be observed."[83] The necessary connection between magic and astrology, in turn, will lead in the end to "a glorification and a worship of the stars."[84]

However compelling the case from human nature may be, there must be a more subtle, philosophical dimension to the linkage between star-worship and astrology. Given Maimonides' well-known penchant for philosophic explanation, it does not seem likely that he would develop his opinion solely on the basis of the observed behavior of generally ignorant people. This more

profound aspect of the problem echoes the difficult metaphysical question of the nature and role of the celestial intelligences and, more generally, the so-called separate or incorporeal intelligences (*mufâraqât*). Medieval cosmologists, including Maimonides, followed Aristotle in associating spiritual beings, or intelligences, with the stars or, rather, with the set of orbs associated with each star, in order to explain their motion. To each orb there belonged an intelligence. The orb itself, which was considered to be a living being conscious of the intelligence which was associated with it, was motivated by a desire to execute its circular motion; and the combination of the motions of the various orbs within the system associated with each star accounts for the observed motion of the star.[85]

In the Maimonidean scheme, it seems, the celestial intelligences play a purely "technical" role, providing the necessary cause for the volitional, intelligent, unceasingly circular motion of the orbs. Particularly revealing in this context are some remarks in Guide 2.11 concerning the stages of the process by which God's bounty is transmitted to the sublunar world. In the first stage, the governance (*tadbîr*) is conveyed from the divinity to the intellects, each intellect receiving according to its rank. At the next level, the intellects emanate "good things (*khayrât*) and lights" onto the orbs, and in the final stage the orbs send "forces (*quwwât*) and good things" to the sublunar world.[86] This surely is a loaded passage. Maimonides' phraseology bears a striking resemblance to an expression used in a similar context by the Ikhwân al-Ṣafâ', "virtues (*al-faḍâ'il*) and good things."[87] It should also be noted that light seems to fill some intermediate role in the transformation of the noncorporeal bounty of the divine into forces which have some physical effect on earth. Of concern to us here is the idea that the emanation of the intellects is limited only to the celestial spheres. The heavenly bodies, in turn, transform this bounty into forces, which, as we have explained, function strictly within the confines of the laws of physics. The astrologers, however, have greatly exaggerated the role of these intelligences; in their system, these intelligences, or the heavenly bodies with which they are associated, are potent spiritual beings, at least insofar as they possess a capacity to influence earthly creatures, above all man, by means of *fayḍ*. A.L. Ivry has recently pointed out that Maimonides uses the term *fayḍ* "without any of the actual ontic structures that normally accompany it and which render it comprehensible. The Maimonidean world ... is not a world of universal substances – nor any other completely separately existing universal being."[88] One damaging consequence of the doctrine which Maimonides imputes to the astrologers is the notion of astral prophecy.[89] It seems that even more is at stake, for a teaching which identifies the ontic structures with, or merges them into, the heavenly bodies leads necessarily to some form of polytheism, that is, the recognition of more than one potent being, or to the conception that the deity itself infuses the celestial domain.

It is with this in mind that Maimonides, in *Guide* 2.6, downgrades considerably the status of angels. Maimonides begins his analysis by noting that the existence of angels is recognized by the Jewish tradition; the angels are equivalent to Aristotle's separate intelligences. Maimonides adds that the

angels function as intermediaries between God and the universe, because the celestial orbs, which are the causes of generation on earth, are set in motion by angels. However, in the subsequent discussion the concept of angels is widened considerably so as to include nearly everything which can be considered to be a delegate of God, even the lowly terrestrial elements. In effect, *all* natural forces are angels. Moreover, each angel is limited to one specific task, and not all are eternal – it would seem that most are not – although all of their species are. Thus in the cosmological context the role of the celestial intelligences is quite restricted. They serve as the object of desire of the orbs, so that as final causes they are the causes of their eternal revolutions. In this way only can the celestial intelligences be considered as divine intermediaries and, as such, they still are not all that different from such mundane causes as the wind or sexual desire. The privileged status of the orbs and the separate intelligences is restored in *Guide* 2.7; these beings are said to carry out their duties freely and consciously. This notwithstanding, I do believe that Maimonides has attained the objective of the preceding chapter, namely, a reduction in the status of the celestial intelligences from quasi-divine spiritual entities to the first among the large class of agents of the deity.

The celestial bodies and the astral forces are thus assigned an important role in Maimonides' cosmology, but their function is limited to the physical realm. No metaphysical function, no commission to bridge the gap between matter and mind, or between the human and the divine, has been bestowed upon the stars. It is the very claim that the stars also function on the metaphysical level which leads to a series of astrological fantasies – for example, that by means of the stars it is possible to read someone's mind or determine what he shall do in the future – and thence to pagan notions of astral prophecy and, inevitably, astral religion. To retreat from the idea of God's incorporeality and transcendence is itself a serious error. To locate the divinity, or some aspect of the divinity, in the stars – which is the inescapable conclusion of astrology, as Maimonides understands it – is to provide star-worship with its theological foundations.

In Maimonides' system God is ultimately and utterly transcendent. Yet provision must be made for some linkage between God and the universe. Now the efflux (*fayḍ*), in Maimonides' system, is associated with the "giver of forms"[90] and thus figures in the connection between corporeal and non-corporeal entities, since the form, which is itself not a body, will find some sensible manifestation within matter. Efflux is thus a critical, and, *eo ipso*, dangerous metaphysical and theological concept. It figures prominently in Maimonides' theory of prophecy, for example.[91] God Himself is sometimes called an efflux,[92] a connotation which serves to express the existential contingency of the cosmos upon the divine.

For all of these reasons, Maimonides totally rejects the attribution to the stars of any capacity in realm of *fayḍ*. Talismans, magical implements for invoking *rûhânîyât*, the spiritual forces associated with the stars, are repeatedly denounced.[93] The celestial intelligences, it would seem, figure in Maimonides' system only because they were thought necessary to explain the rotation of the

celestial orbs.[94] Recently Rabbi Joseph Kafaḥ, a leading Maimonidean scholar, and more importantly for us, a staunch Maimonidean in his own right, has suggested that Maimonides, toward the end of his life, dispensed with the celestial intelligences altogether, having come to the conclusion that the deity alone can sufficiently account for the stellar motions.[95] Although Rabbi Kafaḥ's claim is unproven, and is likely to remain so, its very proposal indicates how theologically troublesome these entities are for the Maimonidean system. The demands of divine incorporeality and transcendence entailed, for Maimonides, the severest possible restrictions on the activity of the celestial bodies, despite their lofty ranking in the standard medieval cosmological scheme, in which Maimonides also shared. Astrological doctrine, as Maimonides interpreted it, requires the ascription to these bodies of powers and capacities which, in some sense, must be considered divine. Hence the inevitable passage from astrology to star-worship.

FATE AND FREE WILL

Discussions of the merits and demerits of astrology usually engender in their wake debates over man's freedom of will. One may even get the impression that certain thinkers – including, perhaps, Maimonides – allowed their philosophical posture on the question of determinism to strongly influence, if not dictate, their attitude toward astrology. I have argued that the main reasons for Maimonides' categorical rejection of astrology are, first, his firm conviction that, on strictly scientific grounds, astrology is vain, futile, and false, and second, his belief that the claims of the astrologers are ultimately founded upon the ascription to the heavenly bodies of divine or nearly divine powers. In other words, the philosophical principles which lead to the rejection of astrology are (1) the identification of religious truth with scientific truth, and (2) the unity and transcendence of the deity. Although the rejection of astrology removes an obstacle from the assertion of free will, it is, to my mind, a mistake to maintain that the belief in man's freedom of the will was the motive for Maimonides' rejection of astrology.

Nevertheless, Maimonides does connect the two issues, for in his discussions of free will he usually identifies astrology with the fatalism which he rejects.[96] Because Maimonides himself connects the two issues, no analysis of Maimonides' attitude toward astrology can ignore the problem of freedom of the will. Moreover while scholars are agreed on Maimonides' clear opposition to astrology, there are some who have maintained that his esoteric position concerning human freedom is at variance with his belief concerning this principle expressed in *Mishneh Torah*, Laws of Repentence 5. In a brief excursus S. Pines suggests, on the basis of *Guide* 3.17 and, especially, 2.48, that "in Maimonides' opinion volition and choice are no less subject to causation than natural phenomena and do not form in this respect a domain governed by different laws or by no laws at all."[97] Pines' position has been endorsed, with some strictures and qualifications, by A. Altmann.[98]

The issue of divine foreknowledge affects this discussion as well. The exact

role of the stars may be a matter of dispute, but for most Jewish thinkers, divine prescience was not. Maimonides could say what he liked about the foolishness of the astrologers, but he too had to confront the apparent contradiction between divine foreknowledge and man's freedom of action. However, from Maimonides' point of view the issue of God's knowledge, which, as one of the divine attributes, belongs properly to metaphysics, is clearly distinct from the question of causation within the natural order. Maimonides himself emphasizes this distinction at the end of *Eight Chapters*, where he raises the subject of divine foreknowledge only because he knows that his audience will not be satisfied with any treatment of freedom of the will unless divine foreknowledge is considered as well. He writes, "Although I had not intended at all to speak of it [God's foreknowledge], necessity forces me to do so."[99] Maimonides' position on God's foreknowledge is clear enough and consistently maintained throughout his *oeuvre*. Knowledge, like the other divine attributes, is predicated of God equivocally; in fact, God's knowledge and human knowledge are totally unlike one another. "God" and "God's knowledge" refer to one and the same entity; to deny this would be to deny God's unity. Just as God is beyond human understanding, so also is His knowledge.[100] This provides some escape from the puzzle of how God can be said to know the future actions of a person if that person is free to act as he wishes, whatever may be our understanding of the operation of the cosmos within which man finds himself. However, the question whether or not the natural order itself is predetermined remains unanswered.

At the beginning of *Guide* 2.48, which, in the opinions of both Pines and Altmann, provides the most compelling evidence for Maimonides' esoteric determinism, three types of proximate cause are listed: (1) natural causes, (2) volitional causes, (3) chance. Critical to the argument of these two scholars is the parallel which Maimonides draws between "volition in the irrational animal" and "free choice in the rational animal."[101] In Altmann's judgment, the upshot is "a complete analogy between the necessities attending natural and volitional causes." On the whole I agree with the thrust of Altmann's analysis, much of which will be reflected in my discussion; what I wish to accomplish here is to relate this problem to the issues which have been raised in connection with astrology.

Maimonides identifies several chains of causation, each of which has its ultimate source in God. The key questions are: Can the cause which is alleged to motivate human rational choice be traced back to or through the stars? If not, is some other type of necessity involved in the exercise of human will?

In view of all that has been said in the preceding sections of this paper, namely, that Maimonides restricts the power of the stars to the physical realm, it is clear that to the extent that the exercise of human will is a rational action, it is entirely free of any determination by the stars. It is not by chance that Maimonides, in the passage reminiscent of some remarks of the Ikhwân al-Ṣafâ which we quoted earlier, does not ascribe to the stars a capacity in the realm of virtue (*khayr*), an ethical trait which depends on human rational choice. Maimonides holds that the human will functions, or has the capacity to

function, as an alternative type of causation, very different from the physical causation of generation and corruption which is traceable to the stars, less different but stil distinct from the psychic causation evident in animals and in thos humans actions which cannot be said to constitute the realization of human potential. Maimonides, as I have made plain, clearly distinguishes a dualism of the corporeal and intellectual realms. The psychic realm sometimes functions as a necessarily ambiguous meeting ground between the two.

An examination of some remarks found in the *Guide* may help to clarify the demarcation between those human volitional acts which belong more to the realm of body and those which appertain to the realm of intellect. In *Guide* 2.4, Maimonides tells us that one of the causes of motion in ensouled beings (a category that includes both man and animals) has its roots in a mental representation (*taṣawwur*) which is the result of an imagining (*khiyâl*) of something suitable or unsuitable, toward or from which the being then moves.[102] In *Guide* 2.10, Maimonides tells us that if the conception which results in motion is not due to seeking or avoiding, then it must be due to intellect (*'aql*).[103] Now Maimonides' first case is drawn from nonrational animals, which act solely upon imagination, and his second describes the celestial orbs, whose actions are based exclusively upon intellection. Man, however, possesses both capacities. Either may supply the internal cause which motivates the volitional act.

Moreover, human conception which follows upon imagination is held responsible not only for volitional acts which are related to bodily needs or indulgences, but also, more seriously, to errors of thought. Interestingly enough, Maimonides chooses to make this point in *Guide* 2.12, in the course of his discussion of certain errors, including those which have led to the belief in astrology. There Maimonides states: "All this follows imagination, which is also in true reality the *evil impulse*. For every deficiency of reason or character is due to the action of the imagination or consequent upon its action."[104]

There remains for us to discuss the necessities attendant to each of these two types of volition. Clearly, the animal volition resultant from an act of the imagination is more appropriately classed among the physical processes. Nevertheless, it is not at all clear that Maimonides would place every phrase of such activity directly within the chain of causation which is mediated by the heavenly bodies. Maimonides himself does not offer any detailed discussion on this point. However, Ibn Rushd does, and in his recent and valuable monography Barry Kogan has investigated the possibility that, according to Ibn Rushd, there "be no need to account for the manifold capacities of living creatures within a narrow material framework."[105] Obviously psychic processes also have their ultimate source in God, mediated by "angels"; but the stars need not form a link in the chain of causation.

Maimonides' position is more transparent concerning the necessity of the volition which is motivated by an act of the intellect. Although such volition represents human free will par excellence, it is not free of the necessity to do the good. Indeed, it would seem to be on a par with the actions of the orbs and the intelligences, which are also said to act volitionally yet are unable to do

anything but the good. However, Maimonides makes it clear that human choice differs from the choice of the orbs and the intelligences in that the latter carry out a constant, unvarying choice, whereas human beings are confronted with an everchanging series of events with regard to which they must choose.[106] Of course, human beings also may make the wrong choice, that is, they may fail to choose to do the good. We are thus drawn to the following conclusion: man may not enjoy freedom of action, insofar as each of the alternative couses of action open to him has its place within a causal nexus, but man clearly has the freedom to choose between the alternatives.

Before summing up this discussion, it may be worthwhile to compare Maimonides' views with those of Alexander of Aphrodisias, whom Maimonides acknowledges as a major authority. More significantly, Alexander had been called upon to explain Aristotle's views on freedom of the will at a time when Stoic determinism pervaded the philosophical atmosphere.[107] Neither Pines nor Altmann has taken Alexander's views into account.[108] An inspection of Alexander's *De Fato* (*Peri Heimarmeneis*) yields some interesting insights into some of Maimonides' remarks.[109]

Alexander distinguishes "reason" and "nature" as two separate causes. The products of nature have their principle and cause within themselves, whereas things produced by choice or reason have their causes from without, that is, *not* in their physical constitution but rather in "the reasoning of the craftsman."[110] Stellar influences are limited to those things caused by "nature" alone.[111]

Alexander further insists that the actions resulting from human volition are not "causeless." Their cause lies within man, and they are brought about by man's realizing what it is to be man. Particularly striking is Alexander's assertion that the activity of human free will, insofar as it represents one of the basic modes of causation, strictly parallels the manifestation of fundamental laws of nature, such as the descent of heavy bodies.[112] This is contrasted with the claim of the fatalists that "individual actions must take place under destiny according to their inborn character, just as heavy things released on high fall downward."[113] The determinists insist that man's actions are the inevitable result of his inborn disposition and hence are governed by the laws of physics, just like the falling of heavy bodies. Alexander's position is that human free will has equal status as a causative agent with the "natures" described by the laws of the physical universe. This is exactly the position stated by Maimonides in *Mishneh Torah*, Laws of Repentence 5.4(7):

> Just as the Creator wished that fire and air ascend, water and earth descend, the orb revolve with a circular [motion], and all the other creatures of the world [act] according to the manner that He wished, so also He wished that man have free will (*reshut*), that all of his actions be given over to thim, and that there be nothing which compels or pulls him [toward a certain action], but rather [that] he himself, by means of the mind (*bi-da'to*) which God has given to him, do all that man can do.[114]

Thus I do not detect any essential difference between the views espoused by Maimonides in the Mishneh Torah and those which appear in the *Guide*,

although there may be some difference in tone. In particular, I observe that in the *Guide* – unlike in the *Eight Chapters* and *Mishneh Torah* – Maimonides does not include a denunciation of the astrologers in his discussion of free will.

In sum, it does seem that Altmann is correct with regard to Maimonides' conception of the true nature of human freedom, "Maimonides does stand solidly in this Aristotelian-Plotinian tradition," namely, that tradition which upholds that man's freedom, his rationality, and, ultimately, his humanity all lie in his capacity to choose to do the good. Now in the development of his argument, Altmann points to the striking parallelism in Maimonides' thought between God's justice, which may manifest itself by negating man's ability to exercise his free will, and prophecy, whose otherwise natural flow may be negated by divine interpretation. There may be a third, equally striking, parallel. Alexander declares that free will is distinguished from "nature" by its ability to *prevent* an act.[115] That remark squares beautifully with the whole thrust of Maimonides' exhortations that the essence of free will rests in the ability to resist the temptations of bodily pleasures and false beliefs. In fact, Maimonides characterizes the ethical perfection necessary for prophecy as "the turning-away of thought from all bodily pleasures and the putting an end to the desire for the various kinds of ignorant and evil glorification."[116] Through the exercise of his free will, man in some sense mimics the divine by utilizing a metaphysical capacity in order to paralyze a physical action.

CONCLUSIONS

In this way the connection between the rejection of astrology and the affirmation of the freedom of the will is seen in a new light. The capacity to choose to do the rational and the good, and to refrain from doing the bad, is in fact, the ability to act on the metaphysical (i.e. noncorporeal) level of the intellect. In effect, it too impinges upon the domain of *fayḍ*. Prophecy also comes about through *fayḍ*. Now the original, fatal error of the astrologers consists in ascribing *fayḍ* to the heavenly bodies. This assertion can be refuted on strictly scientific grounds, since all of the discernible effects of the stars take place according to the rules of the action of bodies upon one another. On the level of theology, the attribution to the stars of a capacity for *fayḍ* necessarily entails a recognition of a role for the stars in prophecy and in affecting human thought and rational choice. It would also give the celestial bodies a quasi-divine status and, at the same time, seriously compromise the notions of God's incorporeality and transcendence. This complex of scientific and theological considerations lies at the heart of Maimonides' rejection of astrology.

ACKNOWLEDGEMENT

The author acknowledges with gratitude the comments and criticisms of Professors Alfred L. Ivry, Joel L. Kraemer, and David Pingree.

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NOTES

[1] "Letter on Astrology," trans. Ralph Lerner, *Medieval Political Philosophy*, ed. R. Lerner and M. Mahdi (1963); rprt., in I. Twersky, *A Maimonides Reader* (New York, 1972) 465; see also R. Lerner, "Maimonides' Letter on Astrology," *History of Religions* 8 (1968): 143–58.

[2] *Hilkhot Teshuvah* 5.4; Twersky, *Maimonides Reader* 78.

[3] "Epistle to Yemen," trans. Boaz Cohen, in A. Halkin, *Iggeret Teman* (New York, 1952); rprt., in Twersky, *Maimonides Reader* 453.

[4] Quite a number of studies have been published concerning various aspects of the medieval debate over astrology, although in my view scholars have yet to become fully alerted to the richness of this body of texts for intellectual history. We can cite here only a few studies. For classical antiquity and early Christianity, see the thorough study of Dom David Amand, *Fatalisme et liberté dans l'antiquité grecque* (Amsterdam: Hakkert, 1973). For Islam: the groundbreaking studies of C.A. Nallino, e.g. "Sun, Moon, and Stars (Muhammadan)," *Hasting's Encyclopaedia of Religion and Ethics*, vol. 12 (Edinburgh and New York, 1921) 88–101, and *Raccolte di Scriti*, vol. 5 (Rome, 1944); the recent surveys of M. Ulmann, *Die Natur- und Geheimwissenschaften im Islam* (1972), chap. 5, and F. Sezgin, *Geschichte des arabischen Schrifttums*, vol. 7 (1979); and the summary of an actual tenth-century round-table discussion on astrology in J.L. Kraemer, *Humanism in the Renaissance of Islam: The Cultural Revivial during the Buyid Age* (Leiden: Brill, 1986) 150–62; see also below, n. 23. For the Christian West: M.L.W. Laistner, "The Western Church and Astrology during the Early Middle Ages," *HTR* 34 (1941): 251–75; and M.T. d'Alverny, "Astrologues et Théologiens au XIIe siècle," *Mélanges offerts à M.D. Chenu* (Paris: Vrin, 1967), 31–50. For the Christian East: G. Graf, "Die Widerlegung der Astrologen von 'Abdallâh ibn al-Faḍl," *Orientalia* 6 (1937): 337–46. For Judaism: see Halkin's introduction to *Iggeret Teman*, and, more recently, R. Barkai, "L'Astrologie juive médiévale," *Le Moyen Age* 93 (1987): 323–48. Further bibliography may be found in F. Boll, C. Bezold, and W. Gundel, *Sternglaube und Sterndeutung*, 6th revised edition with bibliographical appendix by G. Gundel (Darmstadt: Wissenschaftliche Buchgesellschaft, 1974).

[5] In past decades there was considerable controversy over the suitability of the history of astrology as a subject for academic research. See Lynn Thorndike, "The True Place of Astrology in the History of Science," *Isis* 46 (1955): 273–78.

[6] "Letter on Astrology" 465: "The first thing that I studied is that science which is called judicial astrology."

[7] A. Freimann, "Responsa of R. Maimon ha-Dayyan, the Father of Maimonides," *Tarbiz* 6 (1935): 408–20 [Hebrew], first responsum (pp. 413–14). R. Maimon gives here a straightforward response to an inquiry concerning astrologically unfavorable days for blood-letting, without a murmur of protest against the very notion; however astrological medicine was usually exempt from the controversies that surrounded astrology, and, therefore, our evidence regarding the position of R. Maimon is not conclusive.

[8] See Bar Ḥiyya's "Epistle" in defense of astrology published by A. Schwartz in *Festschrift Adolph Schwarz*, ed. S. Kraus (Berlin and Vienna, 1917), Hebrew sec., 23–36.

[9] See the complete text of Bahya's *Duties of the Heart*, Arabic and Hebrew translation, published by Y. Kafaḥ (Jerusalem, 1973) 5.5:254–56; this entire passage is missing from the translation of Ibn Tibbon.

[10] See Y.T. Langermann, "Some Astrological Themes in the Thought of Abraham ibn Ezra," in *Rabbi Abraham ibn Ezra*, eds. I. Twersky and J.M. Harris (Cambridge, USA, 1993).

[11] See the recent edition of J. Levinger (Tel Aviv, 1984), part 3.

[12] S.D. Goitein, *A Mediterranean Society*, 5 vols. (Berkeley: University of California Press, 1967–88) 5: 420–22. Goitein acknowledged *inter alia* his reliance on the series of studies by D. Pingree and B.R. Goldstein of horoscopes preserved in the Genizah.

[13] *Mishneh Torah*, Laws of Idolatry and Ordinances of the Heathens 11.16, Twersky, *Maimonides Reader* 75–76.

[14] *Tshuvot ha-Rashba*, responsum no. 413 (p. 144ba).

[15] L. Thorndike, *A History of Magic and Experimental Science*, vol. 1 (New York: Columbia University Press, 1923) 513.

[16] *Guide* 3.29:514–18.

[17] This work is purported to be a translation with commentary of a Nabatean work. Over the past century a considerable amount of energy has been expended in scholarly debate over its true nature. See the synopsis and bibliography in F. Sezgin, *Geschichte des arabischen Schrifttums*, vol. 4 (Frankfurt a. M., 1971) 318–29. A facsimile edition of this important work based on several manuscripts, but unfortunately incomplete, was published in five volumes by F. Sezgin (Frankfurt a. M., 1984).

[18] See *Mishneh Torah*, Laws of Idolatry and Laws of the Heathens, end of chap. 1; Twersky, *Maimonides Reader* 74; and the uncensored version of *Mishneh Torah*, Law of Kings and Wars, end of chap. 11; Twersky, *Maimonides Reader* 226–27.

[19] Laws of Repentance 5.4; Twersky, *Maimonides Reader* 78.

[20] See below, pp. 149 ff., and the articles of S. Pines and A. Altmann cited in n. 97–98, below.

[21] I have used the edition of Y. Kafaḥ (Jerusalem: Mossad Harav Kook, 1965).

[22] Compare al-Fârâbî, "On What Is Correct and What Is Incorrect in Astrology," F. Dieterici, *Alfârâbî's Philosophische Abhandlungen* (Leyden, 1890; rprt., 1982), para. 23, p. 112 (Arabic), p. 183 (German); ibn Sînâ, "On the Refutation of Astrology," Arabic text in *Rasâ'il Ibn Sînâ*, vol. 2 (Istanbul, 1953) 56, French translation by M.A. Mehren, "Vues d'Avicenne sur l'astrologie," *Le Muséon* 3 (1884): 383–403, esp. 392; J.W. Livingston, "Ibn Qayyim al-Jawziyyah: A Fourteenth Century Defense Against Astrological Divination and Alchemical Transmutation," *JAOS* 91 (1971): 96–103, esp. 98–99.

[23] *Guide* 2.19:310–11.

[24] *Fayḍ* may also be translated as "emanation" or "overflow"; the latter is preferred by Prof. Pines in his translation of the *Guide*. See e.g. *Guide* 2.10:270 ("the four spheres having stars have forces that *overflow* from them"); 2.11:275 ("from the spheres ... forces and good things *overflow* to this body").

[25] *Guide* 2.12:279.

[26] See *Guide* 2.12:280 note 7.

[27] Hints at a physical interpretation of this sort may be found even in the astrological literature. Cf. Ptolemy, *Tetrabiblos*, 1.24. The notions of "the mixture of the rays" (*mizâj al-shu'a'*) is found as early as the writings of Teukros (Tinkalûshâ al-Bâbili, fl. ca. 1st cent., B.C.E.; see Sezgin 71–73), quoted in *Safînat al-Aḥkâm* (MS Dublin, Chester Beatty 3640, fol. 7a). See also the definition of *radd al-nûr* in Ibn Hibintâ (10th cent.), *Al-Mughnî fi aḥkâm al-nujûm*, facsimile edition (Frankfurt a. M., 1987) 2.16. These are just a few random references; a fuller study of the physical side of astrological theory in medieval Islamic civiliziation remains a major desideratum. It should be noted that these ideas were accompanied by an elaborate mathematical apparatus; see E.S. Kennedy and H. Krikorian-Preisler, "The Astrological Doctrine of the Projection of the Rays," E.S. Kennedy, *Studies in the Islamic Exact Sciences* (Beirut, 1983), 372–84.

[28] There is strong reason to believe that in this matter Maimonides followed the lead of Alexander of Aphrodisias. For Alexander's ideas, see Amand 140–41. Publication of some of the extant Arabic texts of Alexander will facilitate the elucidation of this point.

[29] Very little work has been done on this problem. See David Pingree, "Abû Ma'shar," *Dictionary of Scientific Biography* 1 (New York, 1970) 32–39, esp. 34.

[30] *Guide* 21.9:307: "all that he [Aristotle] has explained to us regarding what is beneath the sphere of the moon follows an order conforming to what exists, an order whose causes are clear"; cf. also *Guide* 2.22: 319.

[31] See, for example, Ptolemy's defense of astrology in *Tetrabiblos* 1.1–3. Ptolemy appeals to the evident effects of the sun and the moon, the usefulness of prognostication, and the aesthetic appeal of astrological theory, but it seems that he concedes that the very ambition of connecting terrestrial to celestial events precludes the possibility that astrology will ever achieve exhaustiveness. Ptolemy, however, does not seem to be particurly concerned with astrology's formal structure.

[32] Maimonides' views will be spelled out in detail presently. Cf. A.M. Goichon, *Léxique de la langue philosophique d'ibn Sînâ* (Paris, 1938) 39, no. 84, s.v. *mujarrabât*.

[33] See, *Guide*, "Translator's Introduction" lxix–lxxi, and now, in great detail, J.L. Kraemer, "Maimonides on Aristotle and Scientific Method," E.L. Ormsby, ed., *Moses Maimonides and His Time*, Studies in Philosophy and the History of Philosophy, vol. 19 (Washington: Catholic University of America Press, 1989) 53–88."

[34] Trans. p. 280, "All this follows imagination, which is also in true reality the *evil impulse*".

[35] Vol. 1 of the facsimile edition (see above, note 17), p. 293.

[36] *Guide* 3.29:518.

[37] His arguments are reproduced in J.C. Vade, "Une défense de l'astrologie dans le Madḫal d'Abû Ma'sar al-Balhî [!]," *Annales Islamologiques* 5 (1963): 131–80. In the course of his defense Abu Ma'shar incorporated much Aristotelian physics into his book and, ironically, the Madḫal later served as an important vehicle for the transmission of Aristotle's ideas to Europe. See R. Lemay, *Abu Ma'shar and Latin Aristotelianism in the Twelfth Century* (Beirut, 1962).

[38] In the Introduction to his *Zurat ha-Arez* he writes: "The scholars who are versed in the method of scholarship (*derekh ha-hokhmah*) do not give it [astrology] such a high ranking because its proofs are not correct proofs. Rather, they all derive from conjectures (*sevarot*) and experiences."

[39] "On Astrology" (see n. 23 above), passages 28–29, p. 114 (Arabic), p. 185 (German). Cf. also al-Fârâbî's discussion of *tajribah*, in a somewhat different context, in passage 8, p. 107 (Arabic), p. 175 (German).

[40] My translation from the original Judaeo-Arabic, which survives uniquely in MS Paris, BN Heb. 1211, fol. 19a. I acknowledge with gratitude the efforts of Mr Benjamin Richler of the National Library at Jerusalem, who speedily located and faxed to me a copy of the page in question. Compare the Hebrew translation of Shmuel Beneviste, published by S. Münter in *Maimonides' Medical Writings*, vol. 4 (Jerusalem, 1965) 97. Maimonides may have learned of the classical debate between "Dogmatists" and "Empiricists" from the work of Galen published by R. Walzer, *Galen on Medical Experience* (London: Oxford University Press, 1944). Note in particular the argument of the "Empiricist" on p. 98 (p. 18 of the Arabic text), who mocks those who, if their position be taken to its extreme, would not rely on the experienced helmsman who "has not fathomed the logos of nature"; Maimonides seems to be presenting here some form of the converse of that argument.

[41] My translation from the Arabic, published with a new Hebrew translation, by Y. Kafah, *Letters of Maimonides* (Jerusalem, 1972), 134–35.

[42] See, e.g. the very detailed arguments of al-Jawziyyah, *Miftâh dâr al-Sa'âdah* (Cairo, 1905–1907), 2: 134–36 (*al-wajh al-thânî*).

[43] *Commentary on the Mishnah*, Seder Zera'im, Introduction, ed. Y. Kafah (Jerusalem, 1963) 5.

[44] TB Shabbat 67a.

[45] Cf. Pines' slightly different rendering, see *Guide* 3.37:543.

[46] *Guide* 3.37:544.

[47] Twersky, *Maimonides Reader* 472.

[48] Amand 53–55.

[49] *Guide* 3.17:472.

[50] I cite in order from Pines' translation: *Guide* 1.72:186, "Inasmuch as the fifth *body* as a whole is engaged perpetually in circular motion, it thus engenders forced motion in the elements"; in *Guide* 2.10, Maimonides says much about the governance of the spheres, e.g. (p. 271), "the elements moved by the spheres are four," and, at the end of the chapter (p. 273), he makes clear that it is "the bodies of the spheres" of which he is speaking; and especially in 2.12 (280), "Thus the overflow of the sphere is spoken of, though its actions proceed from a body." Note also that in 2.6 Maimonides remarks that the orbs and stars are lords of every *body (jism)*; this point is obscured in Pines' translation (p. 261), "the lords are *everybody*."

[51] *Commentary on the Mishnah*, Avodah Zarah 3.3.

[52] See now T. Langermann, "The True Perplexity; *The Guide of the Perplexed* 11, 24," *Perspectives on Maimonides*, ed. J.L. Kraemer (Oxford: Oxford University Press, 1990), 193–208.

[53] I have discussed this problem in some detail in "Gersonides on the Magnet and the Heat of the Sun" in G. Freudenthal, ed. Studies on Gersonder (Lerden, 1992), 267–284. It should also be borne in mind that in *Guide* 2.19:305, Maimonides cites the opinion of the later scholars, with whom he appears to be in agreement, that the very term "body" is used equivocally for the sublunar and celestial realms.

[54] *De Caelo* 1.3:270a13 ff.

[55] *Physics* 7.2:243a3–6.

[56] *Physics* 3.1:201a23–35.

[57] *Meteorology* 1.3:340b10–13; *De Caelo* 2.7:289a20.

[58] See Ibn Bâjja's recension of *On Generation and Corruption*, Arabic text published by M. Ma'ṣûmī in *Révue de l'Académie arabe de Damas* 42 (1967):255–61, 426–50, esp. 444; Ibn Rushd, Middle Commentary on *De Caelo*, Hebrew trans., MS Paris BN Heb. 947, fol. 41b.

[59] Trans. 186.

[60] Trans. 270.

[61] Trans. 272.

[62] Trans. 261.

[63] Trans. 187: "... so the death of the world as a whole and the abolition of everything within it would result if the heavens were to come to rest."

[64] *Guide* 2.30:354.

[65] *Kuzari* 4.9, trans. H. Hirschfeld (rprt. New York: Schocken Books, 1964) 215: "The particulars are unknown to us. The astrologer boasts of knowing them, but we repudiate it."

[66] "On What Is Correct and What Is Incorrect in Astrology," para. 13, p. 109 (Arabic), p. 178 (German).

[67] *Al-Shifâ', al-'Ilâhiyyât*, vol. 2, ed. I. Madkour (Cairo, 1960), bk. 9:413. On Ibn Sînâ's opposition to the Aristotelians of Baghdad, see the classic study of S. Pines, "La 'Philosophie orientale' d'Avicenne et sa polémique contre les Bagdadiens," *Archives d'histoire Doctrinale et Littéraire du*

Moyen Age 27 (1952): 5–37. For another possible instance of a polemic between Ibn Sînâ and the Baghdadis on an issue of natural science, see my paper on Levi ben Gerson, n. 8–11 (see n. 52, above).

[68] This emerges very clearly from Levi's six axioms, which he sets down in *Wars* 5, pt. 2, chap. 6.

[69] Trans., 187: "For this way of representing the matter to oneself is most necessary or most useful for the demonstration that the deity is one."

[70] F. Jadaane, *L'Influence du Stoïcisme sur la pensée musulmane* (Beirut, 1968), 161–62.

[71] *Guide* 2.10:270 "even individuals ... have forces of the stars that are specially assigned to them ... yet there also exists a force specially assigned to a certain species." Maimonides' specific concern with the relationship between the stars and vegetation clearly derives from the remark which he quotes from Genesis Rabbah. Cf. the early association of stars and plants in Indian astrology, which is due to Babylonian influence, reported by D. Pingree, "Astronomy and Astrology in India and Iran," *Isis* 54 (1963): 229–46, esp. 232.

[72] In his letter to Samuel ibn Tibbon, Maimonides indicates that Ibn Ẕadiq has followed in the path of the ikhwân; however, a variant reading substitutes "those who [believe in positive] attributes." See the new edition of *Letters of Maimonides*, ed. and trans. Y. Shailat, vol. 2 (Jerusalem, 1988), 552 and n. 12.

[73] Trans, pp, 192–93.

[74] See *Guide* 3.29:514 on the Sabean belief that "the sun governs the upper and lower world" and Abraham's rebellion; cf. 3.45:575 concerning the concept that the *shekhinah* dwells in the west.

[75] *Guide* 1.70:172.

[76] *Guide* 1.70:174.

[77] *Guide* 2.10:271.

[78] *Guide* 1.72:187.

[79] *Letters*, ed. Shailat, vol. 2, p. 553.

[80] For a detailed look at the important cosmic functions which were assigned to tetrads by one thinker of the fifth century, see now N. Aujoulet, *Le Néoplatonisme alexandrin: Hiéroclès d'Alexandrie* (Leyden, 1986) 119–27. For Hierocles, the tetrad is "cause créatrice et ordonnatrice de toutes choses" (p. 127). For a discussion of this Pythagorean notion in an Arabic text, see N. Linley, "Ibn aṭ-Ṭayyib. Proclus' Commentary on the Pythagorean Golden Verses," *Arethusa Monographs*, vol. 10 (Buffalo, 1984), 78–81.

[81] See, e.g. Abraham bar Ḥiyya's defense of astrology (cited above, n. 8). Bar Ḥiyya concedes (p. 28 ll. 29–31) that "it is possible that one may think that the Chaldean science, concerning which our Rabbis have forbidden us to inquire, may be the science of the stars [astrology] about which we have been talking."

[82] Trans. 545–46.

[83] Trans. 542.

[84] Trans. 543.

[85] Aristotle, *Metaphysics* 12.8; *Guide* 1.72:185–86, and 2.4:255–59; and, in general, H.A. Wolfson, "The Problem of the Souls of the Spheres from the Byzantine Commentaries on Aristotle through the Arabs and St. Thomas to Kepler," rprt. in *Studies in the History of Philosophy and Religion*, eds. I. Twersky and G.H. Williams, vol. 1 (Cambridge, Mass: Harvard University Press, 1973) 22–59.

[86] Trans. 275.

[87] *Rasâ' il Ikhwân al-Ṣafâ*, vol. 1 (Beirut, 1957), *risâlah* no. 3, p. 353; Y. Marquet 104.

[88] A.L. Ivry, "Providence, Divine Omniscience and Possibility: The Case of Maimonides," T. Rudavsky, ed. *Divine Omniscience and Omnipotence in Medieval Philosophy* (1985), chap. 9, p. 148.

[89] *Guide* 3.45:576–77; note that here again Maimonides takes care to point out that "all these [angels or spiritual beings] are beyond the Sphere and its stars."

[90] *Guide* 2.12:278–79.

[91] *Guide* 2.38:377.

[92] Guide 2.12:279: "This term, I mean 'overflow' [*fayḍ, efflux*] *is sometimes applied in Hebrew to God, may He be exalted.*"

[93] Thus, e.g. condemnatory excurses concerning talismans are found in Maimonides' commentaries to the following *mishnayot* of *'Avodah Zarah*: 3:1, 3:3, 3:4, 4:7.

[94] Traces of a debate concerning the stature of the separate intelligences in general may be found in a difficult passage attributed to Ibn Bâjja and published by Jimâl al-Dîn al-'Uluwî, *Rasâ il Falsafiyyah li-abî Bakr bin Bâjja* (Beirut, 1983) 198. Ibn Bâjja criticizes al-Fârâbî for claiming that "one of the ancients" had severely restricted the status of the separate intelligences. The real culprit, Ibn Bâjja asserts, is the "errant" Ikhwân al-Safâ'!

[95] *Mishneh Torah ... on the basis of Yemenite Manuscripts, with a Comprehensive Commentary* [Hebrew], ed. and comm. Y. Kafaḥ, vol. 1, Mada' (Jerusalem, 5744/1984), 107, n. 21: "This whole

matter of the orbs' possessing souls, knowledge, and intelligence, even though our Master [Maimonides] set it down here and in the *Guide* – it seems to me that our Master retracted all of this ... I know that people will say that the wish to square the view of our Master with currently accepted opinion has led me to this opinion and to this conclusion. But in truth that is not so."

[96] See note 2 above; *Eight Chapters*, beginning of last chapter, Twersky, *Maimonides Reader* 379–80.

[97] S. Pines, "Studies in Abûl-Barakât al-Baghdâdî's Poetics and Metaphysics," *Scripta Hierosolymitana* 6 (1960) 195–98, esp. 198.

[98] A. Altmann, "The Religion of the Thinkers: Free Will and Predestination in Saadia, Bahya, and Maimonides," S.D. Goitein ed., *Religion in a Religious Age* (Cambridge, Mass., 1974) 25–52, esp. 41 ff.

[99] Twersky, *Maimonides Reader* 384.

[100] *Mishneh Torah*, Teshuvah 5:5(12), and, more fully, *Guide*, 3.20.

[101] Trans. 410.

[102] Trans. 255.

[103] Trans. 271.

[104] Trans. 280.

[105] B.S. Kogan, *Averroes and the Metaphysics of Causation* (Albany, 1985) 176.

[106] *Guide* 2.7:266.

[107] See Amand 135–56; Paul Moraux, *Alexandre d'Aphrodise. Egégète de la Noétique d'Aristote* (Liège and Paris, 1942) 195–202.

[108] However, in another study ("A Tenth Century Philosophical Correspondence," PAAJR 24 [1955] 103–36; rprt. in *Essays in Medieval Jewish and Islamic Philosophy*, ed. A. Hyman [New York, 1977] 357–90), Pines does discuss several of Alexander's treatises (pp. 125–29) and also refers (end of n. 889) to Julius Guttmann, "Das Problem der Willensfreiheit," *Jewish Studies in Memory of George A. Kohut* (New York, 1935) 325–49, who, in an appendix (pp. 346–49), does discuss the possible influence of *De fato* on Jewish and Islamic philosophy.

[109] I consulted the English translation, published alongside the Greek text by A. FitzGerald, *Alexander of Aphrodisias on Destiny* (London, 1931); the anti-fatalist arguments of this treatise are summarized by Amand 143–48.

[110] *On Destiny* 21–23.

[111] *On Destiny* 27.

[112] *On Destiny* 77.

[113] *On Destiny* 89.

[114] The translation is my own.

[115] *On Destiny* 25.

[116] *Guide* 2.36:372.

ROSHDI RASHED

AL-SIJZĪ AND MAIMONIDES: A MATHEMATICAL AND PHILOSOPHICAL COMMENTARY ON PROPOSITION II–14 IN APOLLONIUS' *CONIC SECTIONS*

For a long time the history of Arabic philosophy was limited to the history of the philosophy of individual philosophers. Two series of problems predominated: the first series, of a philosophical nature, was concerned in one way or another with reconciling philosophical and revealed knowledge, that is philosophy and religion. The other series, more historical, dealt with the survival and development of traditional Greek philosophy in the new philosophy. It is true some historians did not fail to appreciate the innovating contributions of this philosophy in the fields of ontology, psychology or logic. But for them, as for other historians, its history centred on a few great names: al-Kindī, al-Fārābī, Ibn Sīnā, Ibn Rushd, Ibn Bājja, etc.

Gradually, however, for philosophical as well as sociological reasons, the scope of the historian was extended and his boundaries widened: he began to integrate the philosophy of rationalist theologians, that of "existentialists," and even that of logician jurists. And this was how, about half a century ago, a theologian like al-Naẓẓām, a mystic like Ibn 'Arabī, logician jurists like Ibn Taymiyya or Ibn Ḥazm of Cordoba, came to be accepted into the realm of philosophy and consequently in history. This integration, by reinstating the activity of these philosophers in their intellectual background, began to correct the distorted image made of this philosophy. But although theologians, mystics and logician jurists really appeared to come into their own again, scientists, and particularly mathematicians, continued to remain outside the range of the history of philosophy. Apart from a few contributions to natural philosophy, the philosophical thought of these scientists has obviously not received the attention it deserves. This deficiency undoubtedly reflects the definite separation which isolates historians of science from historians of philosophy, a separation sustained moreover by the nature of their philosophy. In fact, it lacks inspiration, is thematic rather than systematic, rudimentary in structure and often weak and, compared with the metaphysical systems of philosophers, has little appeal for the historian of philosophy. With very few exceptions, historians of Arabic science pay more attention to technical problems brought up by scientists and are less interested in the discussion of philosophical

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 159–172.
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themes; furthermore, the difficulties of syntax and vocabulary in philosophy are rather dissuasive. However, this prejudice not only gives a distorted picture of the relationship (which is not the subject of this paper) between science and philosophy at that time, but simultaneously deprives us of means of detecting the obstacles confronting scientists. In point of fact the philosophical contribution of scientists of that time is essential to understanding certain scientific inventions, as well as apprehending the rise of new philosophical problems. Therefore, their contribution to philosophy is an integral part of the history of science and the history of philosophy.

We intend to make a series of studies on the history of the philosophy of mathematics, the history of scientists reflecting on how they work, a field which has rarely presumed to consider itself part of philosophy. In this paper we shall limit our study to a single example and theme, asymptotes and two authors, al-Sijzī and Maimonides.

* * *

Apollonius, in proposition 14 of the Second Book of *Conic Sections*, proposes to demonstrate that asymptotes and hyperbola get closer indefinitely, without meeting.[1] This proposition obviously refers to the foreboding notion of infinity. In the first place, infinity is presented as an object of knowledge, insofar as it concerns mathematical beings whose existence implies infinite processes, which is in fact a characteristic of asymptotic behaviour as a whole. But the notion of infinity also implies a means of knowledge required by infinite mathematical constructions, such as the infinite construction of a series of distances between the curve and its asymptote; it is necessary to ensure that the same construction may be repeated.

But it is easy to understand that this notion of infinity, as Apollonius expressed it, must have surprised mathematicians and philosophers. If, in fact, the former could not remain indifferent to the obvious difficulties of the demonstration, mainly due to the use of a notion never clearly defined; the later must have been aware of a new problem which arose at precisely this point and traces of which persist right up to the 18th century: the gap between our capacity to conceive a property and our ability to establish it exactly. Can we establish a mathematical property that we are unable to conceive distinctly? We need to go back in time in order to locate the origina of this philosophical question.

In his *Commentaries on the First Book of Euclid's Elements*, Proclus related the well-known opinion of Geminus concerning some curves, including the hyperbola. He wrote "... others are constantly diminishing the distance between themselves and their straight lines, like the hyperbola and the conchoid. Although the distance between these lines constantly decreases, they remain asymptotes and, though converging upon one another, never converge completely. This is one of the most paradoxical theorems in geometry – ὅ καὶ παραδοξότατόν ἐστιν ἐν γεωμετρίᾳ".[2] Proclus did not comment on Geminus' statement, not did he clarify its "paradoxical nature." Nevertheless, according to the context, this refers to the very status of mathematical infinity.

In fact, according to Proclus, "the infinite exists in the imagination, only without the imagination's knowing the infinite. For when the imagination knows, it simultaneously assigns to the object of its knowledge a form and a limit, and in knowing brings to an end its movement."[3] How can understanding be applied to the infinite as an object of demonstrable knowledge, given these conditions? Now, according to Proclus, this is possible if the infinite is taken as a hypothesis and used as the finite in mathematical constructions. Or, to use his own words, "But the understanding – διάνοια – from which our ideas and demonstrations proceed, does not use the finite for the purpose of knowing it, for the infinite is altogether incomprehensible to knowledge, but taking the infinite as hypothesis, it only uses the finite in the demonstration."[4] As reference to the infinite cannot be avoided when demonstrating Apollonius' proposition or similar propositions, the result is the "paradoxical nature" of this theorem, if one chooses Proclus' analysis.

But this difficulty encountered by Geminus, and Proclus later on, survived them both to the surface again much later. In fact, five centuries after Proclus, mathematicians and philosophers re-examined the same proposition in order to rewrite its formulation and commentary. As a result, and as far as we know, six memoirs in Arabic dealing with this proposition have survived: five in Arabic and another in a Latin translation from Arabic.[5] Three are the work of 10th century mathematicians, al-Sijzī, al-Qummī and Pseudo-Ibn al-Haytham; the other two were composed by the 12th century mathematician Sharaf al-Dīn al-Ṭūsī.[6] But in spite of identical titles and subject matter, these works are different in aim, and consequently in style. While al-Sijzī aimed at founding the property of the asymptote to the hyperbola on a solid basis, al-Qummī sought to generalize al-Sijzī's results as well as the notion of the asymptote to two asymptotic curves. On the other hand, Ibn al-Haytham paid more attention to the consistency of Apollonius' demonstration and reworked the exposition of the entire problem. Lastly, al-Ṭūsī sought to establish the equation of an equilateral hyperbola in relation to a system of axes, that is exactly constituted by the asymptotes of this hyperbola. We shall examine the memoirs of Pseudo-Ibn al-Haytham, al-Qummī and al-Ṭūsī[7] in another publication. Here, we shall concentrate on al-Sijzī's text, where he deals with the problem just mentioned.

* * *

Aḥmad ibn 'Abd al-Jalīl al-Sijzī was a famous mathematician of the late 10th century. Only known to historians for his mathematical writings, he was not however unconcerned with philosophical problems which his own practise brought up. So, in addition to his treatise – the subject matter of this paper –, al-Sijzī was also the author of an authentic text of mathematical philosophy on *Methods for determining geometrical problems*[8]. Acquainted with Proclus' work, he recopied fragments of the Arabic translation of the *Elements of Physics*, mentioned in ancient bibliographies, whose existence we have been able to confirm thanks to him[9]. Moreover, it was quite usual for him to emphasize the philosophical aspect of a result or method in his mathematical works.[10]

This interest in philosophical questions was not peculiar to al-Sijzī; it was common to the great mathematicians of his age, his predecessors (Ibrāhīm ibn Sinān), as well as his successors (Ibn al-Haytham). Therefore this is an inadequate explanation as to why al-Sijzī decided to revive Apollonius' famous proposition. An examination of his text reveals two other important reasons. As far as al-Sijzī was concerned, this proposition encompassed a series of problems which he described in terms somewhat influenced by Arabic Aristotelian philosophy. Al-Sijzī appeared in fact to admit, in the wake of Arabic Aristotelians,[11] that mathematical knowledge, like all knowledge, may be characterized by the couple "conception/judgment" (*taṣawwur/taṣdīq*)." In mathematics this couple is limited to that of "conception/demonstration," judgment being no more than a demonstrative syllogism. Following the Aristotelians once again, al-Sijzī only recognized for "conception" that of essence, as revealed by rational intuition, or expressed in a definition.[12] It is possible, in this case, as for all the others, to paraphrase the famous text of *Posterior Analytics*: conception "reveals essential nature, demonstration reveals that a given attribution may or may not be attached to a given subject."[13] According to this terminology, Apollonius' proposition raises the problem of affirmations that are demonstrable though inconceivable, or at least difficult to conceive.

On the other hand, we know that in order to establish Apollonius' proposition correctly, it is necessary to dispose of concepts and methods which the mathematician al-Sijzī did not possess, i.e. concepts and methods of analysis. But in this instance, philosophical clarification enabled him to carve out a path in expectancy of future mathematical solutions. So therefore, if mathematical difficulties create philosophical thematics, philosophical explanation in turn offers a means of reasoning for the mathematician. These two interrelated tasks fully characterize al-Sijzī's method.

In the first place he was obliged to draw a comparison between conception and demonstration with the aim of establishing a typology of mathematical propositions that will enable him to specify the exact nature of Apollonius' proposition. He began by identifying two extreme types, in the wake of Arabic Aristotelians, whose confrontation shows that a concept does not always exist for everything that can be demonstrated: this is precisely the case of Apollonius' proposition. On the other hand, the essence of the object of a proposition may be apprehended and conceived without need of a demonstration: true and first affirmations are such examples. Other intermediary types lie between these two extremes. Then al-Sijzī extracted the following classification from mathematical propositions:

1. Propositions that are directly conceivable from philosophical principles.

2. Propositions that are conceivable before they have been demonstrated.

3. Propositions that are conceivable only when the idea of their demonstration has been formed.

4. Propositions conceivable only once they have been demonstrated.

5. Propositions difficult to conceive, even once they have been demonstrated.

In order to discern the underlying order that governs the succession of these five types, and thus reach a better understanding of the principle behind al-Sijzī's classification, we must study the examples he gave to illustrate each case.

Thus, the proposition: "continuous things divide to the infinite," corresponds to the first type.[14] This is clearly a direct reference (or via Proclus) to Aristotle's *Physics* III 207B 16, when he wrote, διαιρεῖται μὲν γὰρ εἰς ἄπειρα τὸ συνεχές." "What is continuous is divided into infinitum." Al-Sijzī advised those who wish to understand the concept of the infinite divisibility of any continuum to choose the philosophical approach which may be out-lined as follows: starting from a definition of contiguity and continuity, one starts by showing that two individual things are not contiguous, in order to show that two indivisible things do not form a continuous thing and, finally, deduce the aforementioned proposition. Al-Sijzī refers to Proclus' reasoning here.[15]

One may wonder why al-Sijzī, who was more familiar with Euclid's *Elements* than anyone else, and consequently with the first proposition of the 10th Book, that instead of referring to it, he preferred the philosophical approach, when by "thing" he merely referred to the Euclidean notion of magnitude. His choice was, however, a deliberate one, dictated by the aim he was pursuing: to comprehend the concept of the infinite divisibility of any magnitude with the aid of philosophical clarification and justify its truth. Once this task is completed, the affirmation then becomes a first truth in mathematics and, consequently, capable of engengering deductive reasoning. So al-Sijzī immediately deduced the infinite divisibility of a line, which is a continuous thing. His method therefore seems to be guided by the idea that only a preliminary philosophical study makes it possible to conceive and justify true and first affirmations in mathematics.

The second type of proposition included mathematical propositions which are immediately conceivable, that is prior to any demonstration. In this case, it is not a question of axioms, but of affirmations that are directly dependent on them. This consecution is moreover so immediate that it makes it possible to consider them as axioms, at least for us when we rewrite them. Al-Sijzī gave three examples: the first one was none other than proposition III–10 of the *Elements* – two circles cut each other at two points only – whose affirmation of evidence is inherited from tradition. The intersection of two circles had in fact already been considered in I–1 of the *Elements*, where Euclid admits the existence of points of intersection as evident. But commentators have not failed to point out the weakness of this view, and already by the end of the 10th century, Ibn al-Haytham wrote that "Euclid said that two circles cut each other at one point, but he did not prove that they cut each other; he admitted this property without demonstrating it."[16] More recently, Thomas Heath made a similar observation about the existence of this intersection, when he wrote:

"Euclid seems to assume it as obvious, although it is not so ...,"[17] while it does in fact require the introduction of an axiom of continuity.[18]

So everything indicates, as al-Sijzī supposed, following Euclid, that the existence of points of intersection is evident, and therefore considered this proposition as quasi-primitive. And in fact, if one accepts the existence of points of intersection, it only remains to demonstrate that these points may be no more than two, reasoning by the absurd like Euclid.

Al-Sijzī's second example is even more obvious. It concerns triangular inequality, as expressed and demonstrated by Euclid in the *Elements* I–20: two sides of any triangle, however considered, are greater than the remaining side. This was the theorem the Epicureans put to ridicule saying that "it is evident even to an ass and needs no proof."[19] As Proclus recalled, "that the present theorem is known to an ass they [the Epicureans] make out from the observation that, if straw is placed at one extremity of the sides, an ass in quest of provender will make his way along one side and not by way of the two others."[20] In his defence of Euclid, Proclus did not deny its evident character, he simply attempted to specify its nature when he wrote: "To this should be replied that, granting the theorem is evident to sense-perception, it is still not clear for scientific thought."[21]

The last example of the second type is the following: if the base of an isosceles triangle is increased, then the angle subtended by the base is increased. This proposition may be considered as a corollary to I–25 of the *Elements*, which is deduced "in a purely logical way"[22] from proposition I–4. And this was the proposition B. Russell referred to when he wrote: "indeed Euclid's proof is so bad that he would have done better to assume this proposition as an axiom";[23] which Hilbert did not fail to do.[24]

The third type of proposition included those that are conceivable only when one undertakes their demonstration, i.e. when one forms the idea of setting about making their demonstration. Therefore, according to al-Sijzī, our knowledge of the concept seems to originate in that of the demonstration. But even the simplest propositions of this type are nonetheless less elementary than the preceding ones, as they are not directly deductible from axioms: they are separated by intermediary geometrical constructions and several lemmas. Al-Sijzī took two parallelograms having the same area of his first example, and affirmed that if the length of one exceeds that of the other, then its width will be smaller than the other one. It is clear that this proposition referred to the equality of figures, having the same area but a different shape. However, this concept is not defined in the *Elements* – al-Sijzī's reference – but had to be deduced. If, on the other hand, one considers two parallelograms having the same area and also equal angles, as it seems al-Sijzī did, then his proposition may be deduced from proposition IV–14 of the *Elements*, where Euclid showed that in the case of two parallelograms thus constructed, the sides that surround two equal angles are reciprocally proportional. But Euclid needed 4 lemmas to demonstrate proposition IV–14.

The second example, two parallelepipedes having the same volume, is merely a generalisation of the preceding one. Al-Sijzī suggested representing these two

solids with two pieces of wax of the same quantity. But if this model suggests a representation of the stated property, it does not provide a true concept: to start with, one has to define the concept of equal volume, and then undertake the demonstration using XI–34 of the *Elements*, which requires several lemmas.

The fourth type includes propositions which are conceivable only once they have been demonstrated. Unlike propositions of the preceding type, they are not directly deducible from axioms, but are no longer dependent on our intuition of properties represented by figures. Neither the drawn figure nor the constructed model – for example the two pieces of wax – provide the basis for our conception of the stated property. Moreover, the latter is due to another deeper one, and consequently requires completing the "analysis" before apprehending the concept of its object. Al-Sijzī took proposition I–32 of the *Elements* as an example: for every triangle the sum of the three angles is equal to the two right angles. We know, on the one hand, that the property of possessing angles equal to two right angles is part of the concept of the triangle itself; however, according to what one can read in the *Posterior Analytics*, "whatever can be shown to have its angles equal to two right angles ... that is the first subject to which the predicate in question belongs commensurately and universally, and the demonstration, in the essential sense, of any predicate, is the proof of it as belonging to this first subject commensurately and universally."[25] Commenting on this passage, Proclus noted that this fact "is an essential property of the triangle as such. This is why Aristotle, in his treatise of apodictic reasoning, when discussing intrinsic attributes uses this as a ready example."[26] But this same fact finds its true justification in the famous fifth postulate of *Elements* I.

Al-Sijzī's examples for the first four types are therefore arranged according to the more or less elementary nature of the proposition. This is not only a reflection of the degree of logical dependence in relation to axioms, it also expresses an aprioric element of the evidence of notions corresponding to our intuitive capacity for knowing properties from figures. Consequently, the mathematician is convinced of the possibility of improving our conception by deducing a property that is difficult to conceive from one which is less so. This exactly describes al-Sijzī's method concerning the fifth type.

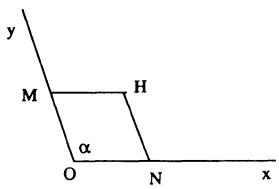
As an example of a proposition that is difficult to conceive even when it has been demonstrated, al-Sijzī naturally chose proposition II–14 of *Conic Sections*, which is precisely the one that led to his question and is the subject of his study. But in this case unlike the earlier types, the mathematician was not satisfied with a simple illustration of an example of the type under consideration. He intended to clarify the obscure concept of the asymptote, in order to be able to understand the property stated and demonstrated by Apollonius. This aim implied, in fact, a search for more appropriate means for defining the infinite. But more precisely, the mathematician discovered in the course of his work that he had to study the finite "limits" of infinite sequences as well as using sequences which tend towards the infinite. This was inevitable if he wished to describe asymptotic behaviour under consideration here. Since Antiquity, asymptotic behavior has been considered in a rather different way

than today, insofar as the asymptote is represented as a limit which cannot be crossed, but a curve may get as close as desired. That al-Sijzī did not use terms such as limits and convergence – concepts which were, furthermore, foreign to mathematicians of that time – is a well-known fact. But the fact that ideas are hidden in geometrical language, the passage we have translated here is more than a witness, it is proof. In our analysis we shall deliberately use therefore a language unknown to al-Sijzī and conceptual means which he did not possess in order to show more clearly his intention and pin-point the difficulties which he might have come across. Contrary to his predecessors and contemporaries, al-Sijzī started by justifying the property stated in II–14, by basing it on a more primitive property. The mathematical translation of this project led him first of all to attempt to construct the hyperbola by points, or a branch of it. But he was not long in being confronted with the problem of the passage from the discrete to the continuous. Let us take up the core of the study, the lemma and theorem.

Let OX and OY be two given straight lines, and H a variable point on surface XOY, such that the area of parallelogramm OMHN is equal to a constant a′.

Let x = ON, Y = OM, then we may write

$$(1) \qquad yx = \frac{a'}{\sin\alpha} = a$$



Lemma. If y(resp. x) *tends towards the infinite, then* x(resp. y) *tends towards* O. If H varies in the plane such that the condition (1) remains verified, then H describes a branche of the hyperbola whose asymptotes are straight lines OX and OY. Al-Sijzī applied this lemma to demonstrating the theorem.

Theorem. When M *moves away indefinitely on* OY, *then* MH *tends towards* 0 *without the point* H *reaching the asymptote* OY.

Examination of the preceding statements as well as al-Sijzī's demonstrations allow us to bring out the following points:

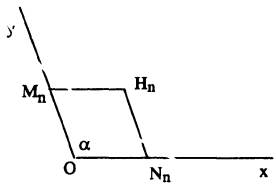
1. In order to establish the passage from the discrete to the continuous, al-Sijzī takes an arbitrary sequence (H_n) of points H such that as the sequence (y_n) that corresponds to it approaches infinity. Thus, if we suppose $x = \frac{a}{y} = f(y)$, al-Sijzī's procedure amounts to demonstrating that

$$\lim_{n\to\infty} f(y_n) = 0.$$

It is as if the mathematician intuitively knew the property expressed by the theorem:

Let f: $\mathbb{R} \to \mathbb{R}$; therefore f approaches l when y approaches infinity, if and only if, for every sequence (y_n) approaches infinity, the sequence $f(y_n)$ approaches l.

2. This translation of the problem highlights the problems encountered by al-Sijzī that make a property difficult to conceive, however well demonstrated. Al-Sijzī now knows that the "limit" of a sequence, when it exists, is not necessarily reached. For example, when he demonstrated that $\overline{M_nH_n} = x_n$ approaches 0, he demonstrated likewise that H_n never reaches the asymptote OY, which means



that no term x_n of the sequence is equal to zero and therefore, to the limit of the sequence. Now it is precisely here that we find the first reason for the difficulty of conceiving the result for the 10th century mathematician.

But another more impressive difficulty is related to what we may call the "discontinuity of the area." Let the area in fact be $(OM_nH_nN_n) = \mathcal{A}_n$. It is obvious that $\mathcal{A}_n = a'$. But $x_n = \overline{M_nH_n}$ approaches 0 when n approached infinity, which implies that the parallelogram, insofar as it is a surface, approaches the asymptote OY in a certain sense. However, according to al-Sijzī, the area of a straight line is zero. In the course of his demonstration, he also affirmed that, using line-segments, it is impossible to produce a surface, given that the area of the surface is necessarily not null. Let us remember that for him it concerns a finite or at least a countable set of segments. Similarly it follows that:

$$\lim_{n\to\infty} \text{area}(OM_nH_nN_n) = a' \neq 0 = \text{area}(\lim_{n\to\infty} OM_nH_nN_n);$$

which leads to a difficulty that, for al-Sijzī, can only be intrinsic and essential: how can we conceive such a property though correctly demonstrated?

It is clear that, for al-Sijzī, the reasons for this difficulty lie not so much in the subjective capacity for representing the mathematical object, but in the method of its construction. The mathematician has to start by elucidating this hidden method, in order to talk about the infinite in the two preceding senses at least, as well as describing this category of asymptotic behavior. The function of the

lemma is precisely to expose this method of construction. It is understandable therefore why al-Sijzī, contrary to textual and historical evidence, assumed that Apollonius had to know this lemma before starting this theorem.

* * *

But al-Sijzī was not content with the lemma or the theorem; he pursued his work as mathematician by considering a more general case, two asymptotic curves. Whatever the importance of his mathematical results, and especially how they were reached, they should not conceal the change in the philosophical status of Apollonius' theorem and the series of problems it created. In fact, at no time was al-Sijzī aware of the "paradoxical nature" of this theorem, though emphasized by Geminus and Proclus after him. It was no longer a question for scandal or surprise, but a simple illustration of a type of relationship between what is conceivable, in the sense of intelligible, and what is demonstrable. Al-Sijzī therefore undertook a methodical inquiry aimed at elaborating the typology and classification of propositions analyzed above; it is true that he noted a gap between them, which to be comprehensible apparently referred to the distinction between the two faculties of the soul. But the mathematician was so concise that his exposition prevents us from describing the nature of this relationship in detail; nevertheless, it must be identified.

Let us remember that, for al-Sijzī, "conceiving" is a discursive act which enables us to apprehend a concept and is, therefore, an act of understanding. But on the other hand, we have noted, the first type of proposition only included in fact axioms that provided the basis for mathematical knowledge. They are conceived, wrote al-Sijzī, "from philosophical principles," that is from principles that are themselves apprehended by intellectual intuition. Philosophical principles behave in relation to mathematical axioms in the same way as intellectual intuitions do to principles. On the other hand, in the case of the four other types, conception is an act of understanding and apparently increases in difficulty in the same ratio as its ability to perceive intuitively properties represented by figures decreases. For example, the intuitive perception that the sum of the angles of a triangle are equal to two right angles, owes less to the representation of a triangle, than when we see the sum of two sides is greater than the length of the remaining side. If conception is dependent on pure intellectual intuition for the first type, it appears that in the four other cases, it operates through intellectual intuition, but based on the representation of geometrical figures.

It would have been surprising if this series of problems escaped the attention of al-Sijzī's contemporaries and successors. We have already noted that mathematicians did not relinquish interest in Apollonius' theorem. We are less certain about the philosophers' contribution and need to wait for the results of further research. Nonetheless, reference to this problem as well as Apollonius' theorem in the works of the 12th century philosopher Maimonides, suggests that they constituted established knowledge for philosophers, or at least those acquainted with mathematical works.[28] We are interested in the Maimonides

reference for two reasons: on the one hand, it is proof of the survival of al-Sijzī's problematics and, on the other, it enables us to estimate the changes this problematics underwent once taken up by philosophers. Maimonides, in his criticism of rationalist theologians, ascribed to them a thesis according to which everything that is conceivable by imagination is admitted as possible by the intellect. In opposition to them, Maimonides wanted to show that impossible things may exist, but which are nonetheless necessary according to the imagination, as for example that "the corporeality of God, and His existence as a force residing in a body. Imagination perceives nothing except bodies or properties inherent in bodies."[29] In his criticism, Maimonides referred to al-Sijzī's argument, in which he introduced a major change when he replaced "conception" by "imagination." This is how he formulated the problem: "Know that there are certain things, which would appear impossible, if tested by man's imagination, being as inconceivable as the coexistence of two opposite properties in one object; yet the existence of those same things, which cannot be represented by imagination, is nevertheless established by proof, and attested by their reality."[30] Just like al-Sijzī, Maimonides gave Apollonius' theorem as an example: "Similarly it has been proved in the second chapter of the book on *Conic Sections*, that two lines, which at first are at a certain distance from each other, may approach each other in the same proportion as they are produced further, and yet would never meet, even if they were produced to infinity, although they are observed to be constantly converging. This is a fact which cannot easily be conceived, and which does not come within the scope of imagination. One of these two lines is straight, the other curves, as stated in the aforementioned book. It has consequently been proved that things which cannot be perceived or imagined, and which would be found impossible if tested solely by imagination, are nevertheless in real existence."[31] It is therefore clear that, except for this substitution, it is the same thesis as that of al-Sijzī. Although it must be noted that Maimonides did not repeat the classification of mathematical propositions drawn up by his predecessor.

To do this, let us briefly refer once more to what Maimonides meant by "imagination" (*al-khayāl*) In the *Guide for the Perplexed*,[32] the meaning of the term is revealed by its opposition to "intellect," (*al-'aql*). According to Maimonides, "imagination" does not distinguish men from animals, it is common to most animals. Furthermore, the action of the imagination is opposed to that of the intellect; while "the intellect analyses and divides the component parts of things, it forms abstract ideas of them, represents them in their true form as well as in their causal relations," and "it distinguishes that which is the property of the *genus* from that which is particular to the individual," that makes the demonstration possible and "determines whether certain qualities of a thing are essential or non-essential." But imagination itself is incapable of assuming any such function: it "only perceives the individual compound in that aggregate condition in which it presents itself to the senses; or it combines things which exist separately, and joins some of them together." Nor can imagination, Maimonides continues "in any way obtain a purely immaterial image of an object, however abstract the form of the image may be."[33]

It is clear that Maimonides merely resumed the doctrine of Arabic Aristotelians, directly based on the third book of the *De Anima* (cf. Chapters 10 and 11). However, the outstanding feature of this doctrine, as expressed by Averroes for example,[34] is precisely the existence of two forms of conception: "imaginative conception" (*taṣawwur khayālī*), according to which "imagined things are conceived of as individual and material" and "discursive conception" (*taṣawwur nuṭqī*), or "intellectual conception" (*taṣawwur 'aqlī*), "which is the abstraction of all matter from a general notion."

It is not necessary to go into greater detail in order to ascertain that not only al-Sijzī's problem survived after him, but it was to be transformed by the work of philosophers. And that explains how the opposition between conception and demonstration is replaced by the couple imagination/demonstration which, it should be noted, is based on psychology; however the deliberate primacy of the psychological study diverted attention from al-Sijzī's research in logic. In fact, Maimonides only considered the last of the five types, that is things that cannot be imagined but those whose existence is established by demonstration. It is not surprising therefore, after studying these examples, that it is always a question of "infinite things."

Therefore, what the problem, after reformulation by philosophers, gained in metaphysical depth, was to the detriment of its logical richness that had attracted mathematicians. But it was to survive mathematicians and philosophers of that time, as is evident from several Hebrew and Latin works in the later 14th century. These works often show the combined influences of the Latin version of an anonymous Arabic text and one of the versions of the *Guide for the Perplexed*, either in Hebrew or Latin.[35] It also survived all these commentators, as Montaigne's[36] or Voltaire's[37] reference proves. Moreover, we know that strengthened and polished this problematics was to be a favourite topic for classical philosophy.

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NOTES

1 The proposition is stated as follows: "The asymptotes and the hyperbola, as they pass on to infinity, approach continually nearer, and will come within a distance less than any assignable length"; see Apollonius of Perga, *Treatise on Conic Sections*, edited by T.L. Heath, Cambridge, 1896, p. 61.

2 Procli Diadochi, *In Primum Euclidis Elementorum Librum Commentarii*, edited by G. Friedlein, Leipzig, 1873 (reproduced in Olms, 1967), p. 177; and G.R. Morrows' translation, Proclus, *A Commentary on the First Book of Euclid's Elements*, Princeton, 1970, p. 139.

3 Proclus, trad. Morrow, *op. cit.*, p. 222.

4 *Op. cit.*, p. 223.

5 See M. Clagett, *Archimedes in the Middle Ages*, Philadelphia, 1980, t. IV.

6 See Sharaf al-Dīn al-Ṭūsī, *Oeuvres mathématiques – Algèbre et géométrie au XIIe siècle*, edition, translation and commentary by R. Rashed, Paris, Les Belles Lettres, 1986; t.I, pp. cxxviii–cxxi, 7–10 and 126; t.II, p. 130 sq.

7 See note 6.

[8] See the edition of the Arabic text and its French translation in *Archives Internationales d'Histoire des Sciences*, vol. 37, no. 119 (1987), pp. 280–296.

[9] In fact our knowledge of the existence of an Arabic version of Proclus' *Elements of Physics* had been based until now on an isolated reference to the title by a 10th century bibliographer, Ibn al-Nadīm [cf. *Al-Fihrist*, ed. R. Tajaddud, Tehran 1971, p. 312]. We have recently learned that some theorems appear "in the *Stoicheiōsis Physikī* that is reflected or partially reflected in Ms Haci Mahmud's texts," i.e. manuscript 5683 in this collection in Istambul [cf. Pines, *Studies in Arabic Versions of Greek Texts and in Medieval Science*, Leiden, E.J. Brill, 1986, p. 287 sqq.]. According to S. Pines, it concerns theorems 10, 15, 17, 18, 19 and 21 in the second part of Proclus' work. In his Opuscula, al-Sijzī's reference corroborates the bibliographer's reference and accounts for the inclusion of the preceding theorems. He recalls the title mentioned by the latter: *Kitāb Ḥudūd awā'il al-Ṭabī 'īyāt*, i.e. *Elements of Physics*, and moreover indicates the purpose of the work: demonstrate the infinite divisibility of magnitude by *the philosophical method.*

However, an anonymous text (according to G. Endress this text is by Yaḥyā ibn 'Adī (†363/974); cf. "Yaḥyā ibn 'Adī's critique of atomism" in *Zeitschrift für Geschichte der arabisch – islamischen Wissenschaften*, Band 1 (1984), Frankfurt, pp. 155–179) from one of the oldest manuscripts in the Bibliothèque Nationale (Paris), makes it possible to show that Proclus' work had been translated, at least partially, into Arabic. (Several sheets date back to the 10th century, in all probability written by al-Sijzī himself, and frequently consulted since the mid-19th century.) Ms 2457 in the Arabic collection includes an anonymous text entitled: *Any continuum may be divided into things that have infinite divisibility.* It reproduces the translation of several propositions from the Greek text of Proclus, as they survived in the Greek manuscript tradition (which is not necessarily the same version used for the Arabic translation).

Here we present the English translation of Greek fragments translated into Arabic as conclusive proof for the existence of an Arabic version of Proclus' work. Brackets indicate passages where the translater gave the meaning but not a faithful translation. Asterisks indicate passages omitted in the Arabic translation.

Proclus, *Elements of Physics*
Def. I: Are continuous things whose extremities are the same.
Def. II: Are contiguous things whose extremities are together.
Def. III: Are successive things between which there is nothing of the same kind.

1. Two indivisible things will not touch each other. If in fact it were possible, let the two indivisibles AB touch each other. But things which touch each other are things whose extremities are together. *From two indivisibles there will be extremities, and therefore A and B are not indivisibles.*
2. Two indivisible things do not form a continuum. If it were in fact possible (let A and B be two indivisibles and let there be from these two a continuous thing). However all continuous things are first of all contiguous; therefore A and B are contiguous, while being at the same indivisible; which is impossible.
Otherwise ...
3. (What lies between two indivisible things in a continuum is continuous.) Let in fact AB be two indivisible things, I say that the intermediary between A and B is continuous. *If in fact this were not so, indivisible A is contiguous to indivisible B, *which is impossible*; therefore the intermediary between them is continuous.
4. Two indivisible things are not successive to each other. Let in fact AB be two indivisible things; I say that A is not successive to B. Because in fact it has been demonstrated that the intermediary between two indivisible things is continuous; now let their intermediary be CD and let it be divided by E; therefore E is indivisible *as it is an intermediary between A and B.* However, are successive things between which there is nothing of the same kind; therefore A and B are not successive.
5. A continuum is divided into parts that are continuously divisible. Let in fact AB be a continuum. I say that AB is divided into continuously divisible parts. Let AB be divided into AE and EB. AE and EB are now either indivisible or continuously divisible. If, therefore, on the one hand, they are indivisible, then there is a continuum from indivisible things, *which is impossible;* if, on the other hand, they are divisible, *then let them be divided into parts again and these subdivided in turn. If, on the other hand, they are indivisible, the indivisible parts will be continuous to each other; if, on the other hand, they are divisible, let them be divided as well, and so into infinity. Therefore any continuum is divided into things that are continuously divisible.*

[10] See, for example, his work "Solution of a problem in the work of Yūḥanna ibn Yūsuf: the division of two halves of a straight line and the explanation of Yūḥanna's book on this subject." Mss BN 2417, ff. 52^{v}–53^{v}.

[11] Let us quote the famous philosopher al-Fārābī, al-Sijzī's predecessor. This is what he wrote in *On demonstration*: "the name of science, as we said earlier, is usually given to two notions, that of judgement and that of conception," f. 1^{v}. Al-Fārābī developed this doctrine in his work.

We may also mention later philosophers such as Avicenne; *Al-Shifā'*; *La Logique* vol. V, edited by A.E. Affifi, Cairo, 1952, pp. 51 sqq.

In his work, *Reply to Logicians*, Ibn Taymiyya made an appropriate summary of this philosophical doctrine: cf. *Kitāb al-Radd 'ala al-mantiqiyyin*, Bombay, 1949, p. 4 sqq.

[12] Cf. for example al-Fārābī, *op. cit.*

[13] *Posterior Analytics*, II, 3, 91a.

[14] See al-Sijzī's text, cited note 8.

[15] Proclus, *Elements of Physics*, *op. cit.*, p. 30–32.

[16] Ibn al-Haytham, *On the solution of doubts concerning Euclid's book of Elements and an explanation of his ideas, fī ḥall Shukūk kitāb Uqlīdis fī al-Usūl wa sharh ma 'ānīh*, Istambul University Library, ms 800.

[17] *Euclid's Elements*, translation, introduction and commentary by Sir Thomas L. Heath, vol. I (Dover, ed. 1956), p. 235.

[18] *Op. cit.*, pp. 235–236.

[19] Proclus, *Commentary...*, *op. cit.*, p. 251.

[20] *Idem.*

[21] *Idem.*

[22] *Euclid's Elements*, *op. cit.*, p. 300.

[23] B. Russell, *Principles of Mathematics* (second edition), London, 1937, p. 405.

[24] *Euclid's Elements*, *op. cit.*, p. 249.

[25] *Posterior Analytics*, I, 4, 74 a.

[26] Proclus, *Commentary...*, *op. cit.*, p. 302. Cf. p. 384, ed. Friedlein.

[27] See the edition and translation of this commentary in *Archives Internationales d'Histoire des Sciences*.

[28] An interest in mathematics was not the prerogative of Oriental Aristotelian philosophers such as al-Kindī, al-Fārābī and Avicenna; it was also shared by Western philosophers who had a direct influence on Maimonides such as Ibn Bājja or Avempace (who died in 1138–39, three years after Maimonides' birth). A study of Ibn Bājja's writings and, in particular, his summary of the mathematical works of Ibn Sayyed, are proof of his acquaintance with contemporary mathematicians and Apollonius' *Conic Sections*. (Cf. Sharaf al-Dīn al-Ṭūsī, *Oeuvres mathématiques*, *op. cit.*, t. I, notes p. 129.) Maimonides was also acquainted with Apollonius' *Conic Sections*, as his notes on some propositions show. See *Ḥawāshī 'alā ba 'ḍ Ashkāl Kitāb al-Makhrūṭāt* [Commentary on some propositions in *Conic Sections*]. Ms Manisa, Genel 1706/6, ff. 26^{v}–33^{v}.

[29] *Dalālat al-Hā' irīn* (*Guide for the Perplexed*), ed. Huseyin Atay, Ankara University Publication, no. 93, 1974, p. 215. See also the French translation by S. Munk, Paris, 1856, pp. 407–410, and the English translation by M. Friedländer, 2nd ed., 1904 (Dover, 1956), pp. 130–131.

[30] *Ibid.*, p. 214.

[31] *Ibid.*, p. 215.

[32] *Ibid.*, pp. 213–214.

[33] *Ibid.*, p. 214.

[34] Averroes, *Kitāb al-nafs* (*The Book of the Soul*), Hayderabad, 1947, pp. 55–56.

[35] On the influence of *De duabus lineis* and the *Guide for the Perplexed*, particularly Book I, ch. 73, see M. Clagett, *op. cit.*, p. 335 sqq.

[36] This is what he wrote: "... en la Géométrie (qui pense avoir gagné le haut point de certitude parmy les sciences) il se trouve des démonstrations inévitables subvertissans la vérité de l'expérience: comme Jacques Peletier me disoit chez moy qu'il avoit trouvé deux lignes s'acheminant l'une vers l'autre pour se joindre, qu'il vérifioit toutefois ne pouvoir jamais, jusqu'à l'infinité, arriver à se toucher." (*Les Essais*, Book II, ch. 12).

[37] See *Dialogues philosophiques*, VII, 1: " ... N'êtes-vous pas forcé d'admettre les asymptotes en géométrie, sans comprendre comment ces lignes peuvent s'approcher toujours, et ne se toucher jamais? N'y a-t-il pas des choses aussi incompréhensibles que démontrées dans les propriétés du cercle? Concevoir donc qu'on doit admettre l'incompréhensible, quand l'existence de cet incompréhensible est prouvée."

JOSEF STERN

MAIMONIDES ON LANGUAGE AND THE SCIENCE OF LANGUAGE*

Neither in the *Guide of the Perplexed* nor in his other philosophical and legal writings does Maimonides lay out a systematic theory of language. In this respect the subject of language differs from other subjects such as prophecy which Maimonides does treat in explicit systematic detail and, in this respect, Maimonides also differs from his Muslim counterparts, especially Al-Farabi and Avicenna, who present elaborate accounts of language. At the same time, it hardly needs to be repeated that the philosophical problems and conceptual confusions to which language gives rise are topics that occupy Maimonides throughout his writings. The absence of an explicitly worked-out theory of language should not, then, be necessarily understood to mean that Maimonides was not working with a theory of language.

In the Epistle Dedicatory to Joseph b. Judah, the addressee of the *Guide*, Maimonides himself suggests two reasons for why no systematic theory of language is explicitly presented in the *Guide*. First, we are told that Joseph has previously "read under [Maimonides'] guidance texts dealing with the art of logic" which, as we shall see, are that part of the *Organon* concerned with the philosophical analysis of language; hence, Maimonides may assume that the general reader of the *Guide* will *already* be familiar with the general account of language as it is found in these logical writings.[1] Second, the absence of an explicit, systematic presentation about language may be because the nature of the subject – which is said to prepare Joseph to receive "secrets of the prophetic books" – requires the indirect and hidden form of "flashes" and "indications."[2] As Maimonides informs us in the "Introduction" to the *Guide*, he wrote his work as one would construct a puzzle, and especially those portions of it concerned with *Ma'aseh Merkabah* which he identifies with divine science, or metaphysics, and *Ma'aseh Bereshit* which he identifies with natural science. For these subjects, he provides us only with "Chapter Headings" which are themselves "not set down in order or arranged in coherent fashion ... but rather are scattered and entangled with other subjects that are to be clarified" (Introduction: 6). The reason for such concealment, Maimonides elsewhere emphasizes, is that, were their content openly revealed, the result would be not simply harm for those incapable of such knowledge but "absolute negation"

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 173–226.
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(I:33:70–1). But if this second reason is why the subject of language is not given an explicit presentation – because it is an esoteric doctrine on the order of *Ma'aseh Bereshit* – we must uncover both the secret and the danger which its revelation would pose for the community at large.

In this essay, I will explore one reason that might have led Maimonides to adopt such an indirect form of presentation in the *Guide* for his opinion of language. I begin, in Part I, by describing an alternative conception of language, rooted in the biblical and rabbinic traditions, whose rejection serves Maimonides as a point of departure for his own view. In Part II, I turn to Maimonides' single explicit positive statement in the *Guide* concerning the nature of language, a statement which raises more questions than it answers, three of which I address in the remainder of the paper. At this point, in order to elaborate Maimonides' hints about his own conception of language, I turn to his *Treatise on the Art of Logic* and, for comparison, to various of Al-Farabi's logical writings of which the most important for our purposes in his *Commentary* on Aristotle's *De Interpretatione*. As many have noted, Maimonides praises Al-Farabi above all other Islamicate philosophers, and especially "for [his] work on logic."[3] From Al-Farabi, Maimonides takes over three major themes in his thinking about language. The first of these (discussed in Part III) is the idea that the philosophical study of language within the context of the sciences – namely, logic – should be concerned specifically with the syntax of inner speech, or thought, with what nowadays we would call 'logical' (as opposed to 'grammatical') syntax. Second, Maimonides adopts Al-Farabi's interpretation of the Aristotelian conception of linguistic signification (as I show in Part IV) and, third, he follows Al-Farabi in holding that the task of the philosophical logician is to translate the philosophically misleading, if not false, idioms of external speech into the philosophically perspicuous and regimented language of inner thought. Against this background, I then argue in the last two parts of the paper (V and VI) that there is a radical shift in Maimonides' thinking from the *Logic* to the *Guide* in connection with the third theme – even while the youthful *Logic* does, as is usually claimed, express many views Maimonides continues to hold throughout his career. In the *Logic*, Maimonides sees no obstacles in the way of such translation: he holds that it is possible to express truths about all subject matters, including divine science and specifically the deity, in the philosophically purified language of inner speech. In the *Guide*, on the other hand, as I demonstrate through an extended analysis of his account of divine attributes, Maimonides is extremely skeptical about the possibility of expressing truths about the deity *even* in the logically precise representations of inner thought. This view is an epistemological perplexity *to* which, rather than *away* from which, the *Guide* leads us, and it may be one reason, I suggest, why Maimonides broaches the subject of language in such an indirect and hidden form in the *Guide*.

I

Among the terms which Maimonides has foremost in mind when he writes that

the "first purpose" of the *Guide* is "to explain the meanings (*inyanyim, al-ma'ānī*) of certain terms occurring in the books of prophecy" (I:Introduction:5) are terms of language or speech, such as, 'speak,' 'say,' 'name,' and 'command,' when predicated of the deity in Scripture or rabbinic literature. As every reader of Genesis knows, the very first utterance in Creation – "Let there be light" – is an utterance of God. According to the literal text, it not only announces the creation of light, it literally brings light into existence. Each of the first three creations is also completed by a divine act of naming: light is called 'Day,' the firmaments 'Heavens,' and so on. Thus, linguistic utterances frame each of these acts of creation, suggesting that the way the world is presented to us – divided into objects and structured according to kinds – is inseparable from the way in which we represent the world through language; language determines as well as describes reality. The rabbis, in turn, expand this power of divine speech so as to encompass all of creation: "With ten utterances," R. Yohanan states, "the world was created"; God Himself is described as "He who spoke and the world was created."[4] Thus, according to both the scriptural text and one rabbinic tradition, a tradition developed to its fullest only much later by medieval Kabbalah, God Himself speaks in language – indeed in Hebrew, according to most of these thinkers – and language serves as God's instrument or blueprint in the process of creation.[5] Language is divine by nature and origin, supernatural rather than natural in power, aligned with the creator rather than with the created.

This same divine or supernatural conception of language was developed by various early medieval Jewish philosophers, such as Philo and Halevi, as well as in various branches of Islam. In the course of elaborating the scriptural and rabbinic conception, the medieval thinkers adopted the terminology of the controversy in classical philosophy over the conventional versus natural origin of language, a controversy to which we will return.[6] Halevi, for example, appears to follow Plato when he claims, on the one hand, that language was invented and (contra Lucretius) did not grow out of natural sounds but, on the other, that the inventor of language intended that his terms would apply to things, not arbitrarily, but in virtue of expressing their nature. Unlike Plato, however, Halevi refuses to believe that any one *human* could have so "contrived a language"[7]; therefore, the inventor of language must have been God who, in turn, taught it to Adam. This divine/adamic language – which Halevi explicitly identifies with Hebrew in its original, pure form (as opposed to its corrupted Arabic-influenced Andalusian state) – is, he further claims, a perfectly "natural" language: one whose names "perfectly fit the things to which they refer," unlike the expressions of other human (or what are nowadays called "natural") languages which widely vary in their degree of fit. Citing Genesis ii:19 as prooftext, he writes: "And whatsoever Adam called every living creature, that was its name – this means that it deserved this name which fits it and which reveals its nature."[8] And for this reason, because of its metaphysical perfection, Halevi also claims that Hebrew is singled out as "the Holy Language," *leshon ha-kodesh*.[9]

The divine conception of language makes, in short, four main claims: first

that language and speech can be literally ascribed to the deity; second, that language serves as an instrument of creation and thereby itself is "outside" rather than "within," or a part of, the created world; third, that names signify in virtue of expressing the natures of their bearers; and, fourth, that Hebrew is perfect – in fact, the most perfect of all languages – in the degree to which its names "fit" their referents and, for this metaphysical reason, is designated "the Holy Language."

The starting point of Maimonides' discussion of language is his denial of this divine conception. Having demonstrated that God necessarily exists (in the Avicennian sense), it follows that He is internally simple; hence, that He possesses no attributes and, in particular, no attribute of speech (*kalām*) (I:65:158). Here Maimonides denies of God, not only the Word in the Islamic sense of a pre-created or uncreated word existing as a real attribute in God, but all manner of divine speech or language, either corporeal (presupposing a voice and sounds) or mental (presupposing a soul into which notions are impressed).[10] When Scripture predicates terms of speech of God, it is no different from "predicating of Him all the actions resembling ours" (ibid.). All of these attributes of action, including those for speech-acts, should be interpreted as referring to natural processes or phenomena for which God is only the ultimate, or first, cause, presupposing rather than excluding a sequence of intermediate natural causes, possibly including human acts. As Maimonides later explains, it is simply the characteristic manner of prophetic writing to omit these intermediate natural causes and ascribe the effect to the direct agency of God, using for this purpose, "the expressions *to say, to speak, to command, to call*, and *to send*" (II:48:410).[11]

Now, having denied the metaphysical possibility of divine speech, Maimonides goes on to explain that the words 'saying' and 'speaking' are each three-ways equivocal in Scripture. Echoing a distinction to which we shall return, these terms apply, first, to "utterance by the tongue" (*al-nuṭq bi'l-lisān*) – which would appear to correspond to what he calls in the *Logic* "external speech" (*al-nuṭq al-khārij*); second, to "notions represented by the intellect without being uttered" (*al-ma'nā al-muṭaṣawwir fi'l-'aql min ghairi an yuntaq bihi*) – what he calls "inner speech" (*al-nuṭq al-dākhil*) in the *Logic*; and, third, to "wishing" or "willing." However, when applied to God, only the last two meanings are possible, or so Maimonides states at first, apparently excluding only the sense of corporeal or external speech. Yet, he immediately adds that, not only do the terms "never signify that He ... spoke using the sounds of letters and a voice," but also that He does not "possess a soul into which notions are impressed so that there would subsist in His essence a notion superadded to that essence"; i.e. he denies also the second sense of mental or inner speech in application to God. The word 'saying' can be used in relation to God in the sense of "inner speech" only if, it now appears, we alter the surface grammar of its containing sentence to mean that the *human addressee* to *whom* God "speaks" has a notion impressed on his understanding – although there exists no external or internal utterance (by God) conveying it. As a consequence, there remains only one sense in which God Himself can be said to "speak," namely, the sense of the

term 'will,' or 'volition,' which is itself a term which, according to Maimonides, is fully equivocal when applied to the deity relative to its human applications (I:56:131). In any case, no linguistic sense remains to the terms 'saying' or 'speaking' when they apply to God; indeed they retain no meaning at all in application to God which resembles their meaning in application to man. Not perhaps without some overkill, this argument constitutes Maimonides' denial of the first of the theses of the divine conception of language.

If no terms of language or speech can be literally attributed to God, it follows of course that the second claim of the divine conception of language – that divine language serves as an instrument in the process of divine creation – must also go. The only sense, Maimonides adds, in which God 'speaks' or 'says' throughout *ma'aseh bereshit*[12] is the sense (whatever that sense is) in which His will is the ultimate, or first, cause of the existence of the universe.[13] But this claim – given Maimonides' oft-repeated statement that the divine will is identical to His wisdom – is compatible even with the thesis that the universe is eternal and uncreated.

Maimonides also explicitly rejects the last thesis in the divine conception of language, the claim that Hebrew is distinguished among languages as the "holy language" because it is the deity's own language and because, as Halevi argued, it is metaphysically perfect: because it expresses better than any other language the essences of the individuals and kinds to which it applies. What makes Hebrew the holy language, according to Maimonides, is not metaphysical but practical: Hebrew embodies an unequalled standard of moral perfection which expresses itself, for example, in the fact that none of its terms literally refer to sexual organs or acts, explicit mention of which would be morally reprehensible (III:8:435). More generally, while "speaking with the tongue [*lisan*, or the faculty of external speech] is one of the properties of a human being and a benefit that is granted to him and by which he is distinguished" (III:8:435), the benefits and distinctions which Maimonides goes on to enumerate are all moral and political, perfections of the kind intended when Israel is commanded to be a "kingdom of priests and a holy nation" (Ex.xix:6). Thus the highest function of external language – of any particular human language – is political, moral, and social, not metaphysical or theoretical. This principle, according to Maimonides, applies no differently to Hebrew than to other languages.

II

Thus far I have described three ways in which Maimonides de-supernaturalizes human language and speech. But if language is not divine in origin, or nature, what does Maimonides think is its origin, or nature, and through what kind of inquiry should phenomena of language be studied? In order to answer these questions, we must return to the one thesis in the divine conception of language we have not yet seen Maimonides reject: the third thesis that terms signify in virtue of expressing the natures or essences of their referents. What is Maimonides' conception of linguistic signification? If he rejects this third thesis, how does he think expressions signify? If he accepts the thesis, can he

somehow integrate it into his naturalistic theory of language without invoking a divine inventor of language whose omniscience enables him to know the essences of all the objects and kinds which terms of language signify?

To answer these questions, let's turn to Maimonides' one explicit statement on the subject of language in the *Guide*. In the course of laying out his esoteric interpretation of *ma'aseh bereshit* in II:30, he tells us that the verse "*And the man gave names, and so on* [Gen. ii:20] ... informs us that languages are conventional and not natural, as has sometimes been thought" (II:30:357–8). Now, this statement is, at best, one of Maimonides' "chapter headings," calling out to us for interpretation on at least three different issues.

1. Assuming that language is not divine, where among the sciences or arts does its investigation fall? Maimonides' statement in II:30 is intriguing in just this connection because he locates the subject of language within his exposition of *ma'aseh bereshit*, or natural science, thus suggesting that the study of language – in particular, the study of semantics, naming, and signification – *is* part of natural science. On the other hand, the *content* of Maimonides' statement is that languages are conventional *rather than* natural; i.e. that they are at least in part the product of man's voluntary will. In the *Logic*, however, he defines natural science, or physics, as the study specifically of "material things, existing, not as products of human will, but in nature."[14] Given these conflicting indications, what is Maimonides' view of the epistemological status of our knowledge of language? Is it or is it not the subject matter of a philosophical science?

2. What does Maimonides mean in the passage quoted by the terms 'conventional' and 'natural'? As Harry A. Wolfson reminds us, these terms were used by different ancient philosophers with different senses.[15] Hence, we cannot simply *assume*, despite Maimonides' general Aristotelian background, that he is using the term 'conventional' as Aristotle himself used it. And, if we cannot assume this, what exactly is the sense in which he is using it?

3. *Ma'aseh bereshit* is one of the mysteries (*sodot*) of the Torah whose interpretation can only be conveyed through "chapter headings," indirectly and by allusion, in order not to harm or endanger those incapable of such knowledge. Now, because he includes the subject of language as part of his exposition of *ma'aseh bereshit*, one might infer that it is also a *sod*, or mystery, which must be concealed. But if this is so, what is the specific *sod* contained in the nature of language and what danger would its revelation pose for the community at large?

I will take up these three questions in order, beginning with the question of the relation of the study of language to the sciences,[16] a question Maimonides discusses most extensively in Chapter XIV of his *Treatise on the Art of Logic*.

III

The proper province for the study of language, to be exact, linguistic meaning and signification, was a subject of much controversy in early Islam, especially in the environment of Al-Farabi's tenth century Baghdad. Maimonides, in the twelfth century, was not a direct participant in this controversy, but it is only against the background of this dispute that we can fully appreciate some of his remarks about the study of language and logic.[17]

Already in Antiquity, the philosophical study of logic was distinguished from the non-philosophical discipline of grammar by its concern with *significant* expressions. But beginning in the ninth and tenth centuries when the Aristotelian corpus was translated into Arabic, the "new" Greek logic was immediately placed in confrontation with the indigenous Arabic grammatical tradition of Islam, the rivalry between the two pursuits was intensified, and the division between them sharpened. Much of the ensuing dispute between the grammarians and logicians over which of the two should be regarded as the "true custodian of sound discourse" was motivated by Muslim religious-nationalistic resistance to the foreign threat of Hellenistic culture.[18] However, in the course of defending the validity and utility of their "new" discipline against the entrenched authority of the Arabic grammatical tradition, the logicians enriched and deepened the philosophical import of the received terms by which logic was differentiated from grammar. Of the various aspects of language or speech to be investigated, the Aristotelians gave over everything *except* semantics, the theory of meaning, to the grammarians; namely, orthography, lexicography, phonology, morphology, syntax, and prosody. They still included these subjects of grammar, together with *fiqh* (jurisprudence) and *kalām* (dialectical theology), in the standard canon, or curriculum, of "generally known" sciences but as non-philosophical, "Islamic," or "Arabic" sciences.[19] They maintained, moreover, that this division was grounded in a substantial epistemological difference between the two classes of "sciences." Because grammar is nation- or language-specific, and therefore must be conventional, it could never attain the same status as the philosophical sciences which were regarded as universal, or natural, and known by unaided human reason.[20] The one aspect of language which still remained contested by the two disciplines was semantics, the study of meaning: Should it be relegated to the subject matter properly studied by the grammarians – e.g. the tradition of indigenous Islamic grammar with its intimate knowledge of the fine nuances of meaning that turn on subtle differences of Arabic wording? Or should it be assigned to the philosophical sciences, i.e. to Aristotelian logic, according to which meaning is a function of thought – itself universal and invariant across language – and, therefore, independent of the accidental features of the particular languages studied by the grammarians?[21]

For Maimonides, as for Al-Farabi, the answer to this question was, not surprisingly, Logic. We can see this point of view represented already in the opening passage of Maimonides' *Treatise on the Art of Logic*, a passage he begins by distinguishing "the noun which the Arabian grammarian calls a

beginning" from what "the logicians call a subject" and "that which grammarians call information concerning the beginning" from what "the logicians call a predicate."[22] A predicate, he continues, may be either a noun, a verb, a particle, or a phrase. Against the background of the dispute between the logicians and grammarians, Maimonides' reason for beginning on this note is clear: For the purpose of determining the correct units of meaning and significance – "correct" given the aims of sound reasoning and the attainment of knowledge – the categories distinguished by the grammarians are inadequate or irrelevant; the only semantically significant units are the logically significant units, e.g. subject and predicate. Only if we abstract away from the differences of grammatical form (e.g. the differences between nouns, verbs, and particles) that attach to the concrete expressions of language – so Maimonides seems to argue – can we recognize those differences of form that truly matter for meaning: the *logical forms* (to borrow contemporary terminology) encoded in natural language, the forms of structures which fall to logic to uncover in language.[23]

This opening paragraph touches on two interrelated themes in Maimonides' conception of logic, both of which are presented most explicitly in the last chapter of the *Logic* and both of which Maimonides takes over from Al-Farabi.[24] The first of these themes, to which we have already referred, is that the discipline and methods of logic, not those of grammar, constitute the proper study of the meaning and signification of language. The second is that the specific aspect of meaning which logic investigates is the syntax of thought. That is, logic, *like* grammar, is concerned with features of form or structure – syntax, as it were – abstracted away from content or subject matter. However, *un*like grammar, it is concerned with the structure of the thoughts expressed rather than with the structure of the speech or language used to express the thoughts. To explain these two themes more fully, let us look more closely at chapter XIV of the *Logic*.

Maimonides begins this concluding chapter by distinguishing three meanings or notions (*al-ma'ānī*) with which the term 'logic' (*manṭiq*) is used. First, the term can refer to the rational faculty, or power of the human soul, in which Maimonides includes both the theoretical and practical intellects.[25] In a second sense, it is used to signify the intelligibles which man has already intellected, and which Maimonides calls "inner speech" (*al-nuṭq al-dākhil*, also translatable as "inner reason"). Finally, in a third sense – whose relation to the second is not immediately evident – the term 'logic' can be used to refer to the linguistic expression (*al-'ibāra bi'l-lisān*) of the intelligible which is "impressed upon the soul"; this he calls "external speech" (*al-nuṭq al-khārij*, also translatable as "external reason"). Putting aside the first sense of the term as referring to a faculty or power, Maimonides' conception of logic is concerned, then, with *nuṭq* in a very broad sense: with language or speech, not in the grammarian's sense of (grammatically well-formed) strings of physical sounds which characterize a particular human language, but as a vehicle for the expression of reason (which '*nuṭq*' ambiguously means), both the "internal" representations of intellectual apprehension and the "external" representations vocalized with

the tongue. These two kinds of speech, or kinds of representations, are, moreover, closely related methodologically. Logic, as opposed to grammar, is concerned with external speech *only insofar* as it is the expression in words of intelligibles, i.e. inner speech. At the same time, logic has access to the intelligibles of inner speech only through the medium of external speech, the concrete words of physical utterances. Thus the proper philosophical study of "language," whether the focus is primarily on internal or on external speech, must involve the study of one *in relation to* the other, words in relation to the thought they express and thought as expressed in words. As Al-Farabi puts it in his *Enumeration of the Sciences*, logic is concerned with "the intelligibles (*ma'qūlat*) in so far as they are indicated by the utterances, and the utterances in so far as they indicate the intelligibles."[26] And in the *Commentary* on *De Int.* even more explicitly: "The logician considers thought as relating to both sides, namely, to the entities outside the soul and to [external] speech. He also studies [external] speech by itself, but always in terms of its relation to thought" (24.5–7).

Maimonides takes this conception of logic as concerned specifically with the relation between internal and external speech one step further. The art of logic, he continues, provides the inquirer with "rules" – instruments or tools – to avoid error or falsehood and to enable him to acquire certain knowledge about "everything which it is in man's power to acquire certainty about."[27] Moreover, he describes two such sets of rules, or rules that govern two different "levels" of discourse. At the first level, the level of inner speech, logic provides rules directly for the correctness, or sound use, of the intelligibles, i.e. internal reason [or speech; *nutq*]. At the second level, it is said to furnish rules for the correct use of the expressions of external speech but only, Maimonides qualifies this claim, insofar as those rules are "common to all languages." What, then, is the relation between these two sets of rules? And what is meant by the qualification that those rules must be "common to all languages"? The answer to these two related questions brings us to the second theme in Maimonides' conception of logic, a theme which he adopts, once again, from Al-Farabi.[28]

According to Al-Farabi and Maimonides, external speech or language, *as distinct from* thought, or internal speech, is conventionally adopted by and, therefore, always peculiar to one or another nation; the evidence for this is, of course, that the language spoken and its rules vary from community to community. Hence, *linguistic* features, and the grammatical rules that govern them, are simply not the kind of thing that can ever be "common to all languages," except fortuitously as it may turn out. This is indeed the very reason the logician gives for consigning the investigation of features of external language *per se* – language considered independently of the thought expressed – to the grammarians. *If* there are any "rules common to all languages," they must be, then, about the notions "impressed on the soul," i.e. about features of the thoughts expressed in external speech; *not* about features of external speech *qua features of external speech*. In fact, there are such universal rules. Thoughts, or "traces in the soul," as Al-Farabi states in his *Commentary* on *De Int.*, are "the same for all communities" (27.6–9), i.e. they are universal. The reason,

moreover, is that they are "based on nature" and were "given man by nature" (Ibid. 27.5–18). Therefore, if logic is said to be concerned with rules of external speech insofar as the rules are "common to all languages," what is meant by this can only be that "logic is concerned with thoughts, <more specifically, with thoughts> as signified by expressions and as somehow related to entities" (18.3–6).

As the last quotation indicates, our only epistemic access to abstract thoughts is through the concrete utterances or inscriptions that express them. However, the relation between the two is not arbitrary. The utterances of external speech, Al-Farabi argues, "imitate" their corresponding thoughts in those respects "common to all languages," and in those respects the utterances can serve as "substitutes" for the thoughts and be "put in the place of [them]". In an almost Fregean voice, Al-Farabi states: "Principally, the purpose [of logic] is to explain the composition of thoughts. But since thoughts are difficult to grasp, Aristotle substitutes for them the expressions that signify them and studies their composition instead, with the result that it appears as though there were no difference between the composition of expressions and of thoughts" (*C. on De Int.* 25.21–26.3). Unable to examine thoughts directly, then, the logician studies external speech; but his eye is always on the corresponding thought element which he can abstract from each external expression. And to determine whether a given type of linguistic feature does indeed reflect an internally significant thought element, rather than simply an artifact of external speech, Al-Farabi sometimes also talks as if one can use his criterion of universality as a practical test: see in fact (e.g. through comparative linguistics) whether the feature in question is idiosyncratic to a particular language or "common to all languages."[29]

Yet, while logic is concerned with thought as opposed to speech, it is not concerned with all features of thought. In yet another revealing statement borrowed from Al-Farabi, a statement which concludes the passage already quoted, Maimonides says that, according to the ancients, "the relation of the art of logic with respect to the intellect is the same as that of the art of grammar with respect to language."[30] Now, as F.W. Zimmermann has convincingly argued with reference to Al-Farabi's use of this formula, the intended point of analogy between logic and grammar is their common concern with form or structure.[31] Just as grammar is concerned with the structure as opposed to content of linguistic utterances, so logic is concerned with the structure of thought, or of the intelligibles, as opposed to their content. According to Zimmermann, Al-Farabi was possibly the first in the Aristotelian tradition to seriously pursue the idea that logic is concerned with the *form*, or *structure* [*ta'līf*, *tarkīb*; lit: composition, combination], of a phrase as opposed to its *content* – the thing(s) or state of affairs it is about – or, as Al-Farabi puts it, its *matter* [*mādda*]. And given the further thesis that logic, as distinguished from grammar, is concerned with thought/inner speech as opposed to external speech, it follows that logic is concerned, not with linguistic or grammatical form, the form of language *qua* language, but with the form of thought, i.e. the form of language *qua* the expression of thought. Hence, there emerges in Al-

Farabi's logical writings a distinct notion of *logical* – as opposed to grammatical – *form*.

It is in this sense, some have suggested, that Al-Farabi (and, for that matter, Maimonides) conceives of logic as a "grammar of the mind" or, conjoined with the further claim that logic studies "rules common to all languages," as a kind of "universal grammar," to anticipate the seventeenth century and contemporary uses of this term.[32] But it should be emphasized that what is meant by these descriptions in the Al-Farabian and Maimonidean contexts is neither the current idea of a universal grammar, i.e. an endowed *language* faculty in the mind, nor a set of rules that describe *linguistic universals*, features that in fact exist in all human languages. The point, rather, is that logic is the study of the *syntax of thought* and, since thought is universal, so is its grammar.

Characteristically, Maimonides nowhere spells out in detail comparable to that of Al-Farabi either this distinction between the form and matter of thought or his understanding of the Al-Farabian formula he borrows.[33] That he was nonetheless working with an interpretation like Al-Farabi's can, however, be seen clearly enough from the following comments with which he concludes his description of the limitations of external language to express divine (essential) attributions:

> These things are not hidden from one who is trained to understand notions [*ma'ānī*] according to their true reality and has considered them with the apprehension that the intellect has of them and in the manner the latter has of stripping them [*tajrīd*] [of accidents and matter], that is, has considered them not merely in the summary fashion [*al-tajammul*] of which words are indicative. (I:57:133)

The Arabic term translated here as "stripping them [of accidents and matter]' is the same verb '*tajrīd*' which Maimonides uses later in I:68:164 and I:73:209 to describe that step in the formation and apprehension of intelligibles in which the intellect, in intellectually cognizing a material object, "strips its form from its matter" and represents to itself the "pure abstract form," i.e. the form abstracted, or stripped, of matter and accidents. Now, what Maimonides means to say in the passage in I:57 is not only that the intellect must separate out, and abstract, the intelligible notion, the representation of a form, from the word – which is a composite of matter and form – whose meaning it is; he uses the term '*tajrīd*' for this purpose precisely because of the Al-Farabian opposition of form, or structure, to (subject) matter – or to the word "as a whole" composed of both form and matter. In part, to be sure, this is to play on the term 'form.' For the form (*sūra*) which the intellect abstracts from the material object is its *essence*, while the form which Al-Farabi argues is to be abstracted from language (for which, according to Zimmermann, he appropriates the words *latīf* and *tarkīb*) is its (logical) *structure*. For the logician, however, the essence of language *is* its structure; hence, the appropriateness of the terminological appropriation of '*tajrīd*.' Thus, with the objects of external speech as with material objects, Maimonides holds that the task of the

logician–philosopher is to strip, or abstract out, the form, i.e. structure, of the thought expressed by linguistic expressions in their composite "wholeness" [*al-tajammul*][34] from their matter, i.e. their content or subject matter.

Like Al-Farabi, then, Maimonides holds that logic, or the philosophical study of language, focuses on the structure of the inner thoughts outwardly expressed in words. However, Maimonides seems to push the logician's orientation toward thought one step further than Al-Farabi. The underlying motif of the larger context in Maimonides' *Logic* is that in putting thoughts into words one invariably creates obscurity and confusion, that outer expression in words cannot but "hide" the true reality as represented by the inner intelligible because of "the summary fashion [*al-tajammul*] of which words are indicative." Why *must* words be this way, i.e. obscure and confusing? Because, Maimonides would undoubtedly respond, words, themselves composed of form and matter, are the objects of the faculty of imagination "which is in no way able to hold itself aloof from matter, even if it turns a form into the extreme of abstraction. For this reason there can be no critical examination in the imagination" (I:73:209–210). With words, as with other material objects of potential apprehension, one is tempted to say that their "matter is a strong veil preventing the apprehension of that which is separate from matter as it truly is" (III:9:436).

For the same reason – that all external speech is contaminated to some degree by the faculty of imagination in its process of apprehension – certain uses of words are also subject to the greatest abuses of understanding. The greatest falsehoods – most notably, belief in the corporeality of God – follow from letting one's imagination follow the external sense of external speech in its most externalized, public form, the form of written books, and especially those written books that are uncritically revered by the people.[35] However, those "Adamites" who seek that highest state of apprehension whose consequence is a "state of perpetual permanence," Maimonides cautions us, "only reflect on the mental representation of an intelligible," not, in other words, on its expression in material words.[36]

The same negative judgement of external language runs throughout ch. XIV of the *Logic*. There Maimonides says that it is only when the rules of logic govern external speech that it is "shown the way to what is correct and guarded from error" – implying that when left to itself, or to the rules of grammar alone, "what is expressed by the tongue" does *not* "conform to what is in the mind." "The [external] expression [either] surpasses, [or] is inadequate to, the notion which is in the soul." That is, the grammatical form, or syntax, of a sentence in ordinary language *mis*leads the inquirer away from truth; it serves only as a source of obscurities and false implications. The best that can be done with it – and the Maimonides of the *Logic* mentions no obstacles that stand in the way of this program – is to regiment it through the rules of logic and, thereby, bring it into "conformity" with the internal speech which Maimonides says does serve as reliable discourse for the purposes of rational inquiry. At the risk of sounding anachronistic, we might recast Maimonides' remarks here in contemporary terminology as the proposal that internal speech governed by the

rules of logic can serve as a "logically perfect language": a language, or system of symbolic representation, whose structure or syntax mirrors its intelligible meaning and with which we can reason properly and attain knowledge.

Moreover, with the expressive resources of such a logically perfect language of thought, the Maimonides of the *Logic* seems to see no significant limitations on man's power to express all possible knowledge in this language: "In this way," he writes, "[man's rational power] will acquire certainty concerning everything which it is in man's power to acquire certainty about." This ambiguous statement might, of course, be read as limiting the scope of human knowledge; however, this is not Maimonides' intention in the *Logic*.[37] The whole tenor of the passage in which it occurs suggests that the phrase 'everything which it is in man's power to acquire certainty about" does not serve restrictively to qualify human knowledge but to express its unbounded potential, man's ability to express his knowledge even of the highest truths of metaphysics. At the same time, it should be acknowledged that the *Logic* is not an epistemological essay in which Maimonides *argues* for or *defends* such an optimistic conception of human knowledge, one which would include metaphysics. In particular, then, it would be unjustified to argue *simply* on the basis of his *silence* about possible restrictions on human knowledge and expression in the medium of inner speech that at the time of the *Logic* Maimonides had expressly formulated and adopted the view that human knowledge is unrestricted and extends to metaphysics. All that we can validly infer from his silence is that at that time *either* Maimonides in fact believed that there are no such epistemic limitations or the question of limitations was not a live issue for him which required defence or criticism. Yet, one telling passage indeed suggests that Maimonides in the *Logic* in fact held the view that human knowledge does extend to metaphysics or divine science, including positive knowledge of the deity. In ch. X, in the course of illustrating what a definition is, Maimonides writes that "sometimes 'man' is defined as a mortal speaking [rational] creature, so that mortality is the ultimate difference between men and angels." Here "angels" are, as Maimonides explicitly states later in ch. XIV, the separate intellects. But if mortality alone is what distinguishes them, then it would appear that they do not differ in their respective ranges of possible knowledge and internal speech. Just as the intellects presumably have knowledge, and can express truths, of metaphysics and divine science, including statements about God, so can man.

In sum, then, Maimonides of the *Logic*, following Al-Farabi, situates himself here among those philosophers who, first, warn us of the dangers of confusing the grammatical form of a sentence with its logical form and, second, in order to remedy these deficiencies, give the philosopher–logician the task of *improving* on, or *reforming*, external speech to make it adequate to the aims of perfect knowledge, including even the highest knowledge of metaphysics and divine science.

Throughout the *Guide*, Maimonides continues to insist on the distinction between internal and external speech. While our grasp and understanding of internal speech, or thought, is *epistemically* dependent on external language, he

argues that the former is *ontologically* independent of the latter. The scriptural terms "speaking" and "saying" mean equivocally "the notion represented by the intellect without being uttered" in addition to external speech (I:65:158ff). What is meant by the word 'name' both in Scripture and rabbinic literature and, in particular, in discussions of the names of God, is not the concrete word but the essence or mental notion signified by it (I:62:151). God is described in Scripture as (corporeally) speaking, and prophets as hearing, only because "we do not know nor can we represent to ourselves how a notion can be transmitted from the soul of one individual who is among us to the soul of another individual except through the instrumentality of speech, which is a sound produced by the lips, the tongue, and the other organs of speech" (I:46:98). However, internal speech can and does exist independently of external speech. Most notably, the scriptural descriptions of the celestial spheres as "speaking" and "telling" are not simply metaphorical figures, i.e. projections of "language appropriate to the state of the speaker [of the verses]" onto the celestial spheres; rather they are literal descriptions of the spheres themselves

> according to their essence ... as praising God and making known His wonders without speech of lip and tongue .. For he who praises through speech only makes known what he has represented to himself. Now this very representation is the true praise, whereas the words concerning it are meant to instruct someone else to make it clear concerning oneself that one has had the apprehension in question. (II:5:259–260)

We humans, then, cannot study internal speech, or thought, except through the medium of external language, but the existence and expressive power of the former is not contingent on the latter.

Not only indeed is internal speech – like that of the spheres – literally describable as *a* language, as the object of "saying," "telling," or "speaking." For the purposes of theoretical inquiry, it is the superior language, the more perspicuous system of representation in which it would be preferable to express oneself – *independently* of and *rather than* with the words of outer speech. As prooftext for his claim that the "true praise" of God is the spheres' internal speech, rather than any expression in external speech, Maimonides cites Psalms 4:5, a verse which we shall see him use throughout the *Guide* to advocate the superiority of "silent" internal speech. Thus, to a greater degree than Al-Farabi, Maimonides seems to treat the mental representations, thought, or internal speech, though composed of intelligibilia and images rather than sounds and letters, as a self-sufficient language, or medium of representation, in its own right.

On the other hand, while the Maimonides of the *Guide* continues to hold that internal speech is significantly *superior* to the words of external speech, we also find in the *Guide*, now in contrast to the *Logic*, the implied claim that also internal speech is significantly limited, in particular, when it is called upon to represent the subject matter of divine science and, even more specifically, propositions about God. In the *Guide*, then, Maimonides appears to qualify

his opinion of the expressive power of internal speech which, I argued earlier, is unqualified in the *Logic*: internal speech may be preferable to external speech, but it is still seriously inadequate for the expression of certain subjects. Maimonides now recognizes that the limitations of external speech may be due not simply to its *externality* – its dependence on material words – but also to the very fact that it is a *language* – a medium of expression constrained by certain parameters of syntax. To the extent to which internal speech is also, then, a language bound by the same syntactic constraints, it will be subject to the same limitations.

In other words, by emphasizing that the mental representation, while independent of and superior to the utterance, is none the less itself a kind of *language*, or *speech*, the Maimonides of the *Guide* wishes to draw our attention to a certain respect in which external and internal speech resemble each other, a respect in which he himself in the *Logic* had insisted that they were different. As I shall argue at length in Part VI, Maimonides intends for us to understand that thought, while far preferable to external speech for purposes of intellectual apprehension, is also significantly limited in its expressive power and cannot but *mis*lead the inquirer about certain subject matters, namely, metaphysics and the deity. The source of this limitation on the expressive power of thought is – although I shall not argue this here – the human intellect, whose powers of apprehension of non-material entities, the subject matter of metaphysics and divine science, is narrowly constrained.[38] However, what I shall argue in detail is that the limitation of the intellect leads to limitations both on *what* it can know – the entities which it can signify in the language of thought – and also on *how* it can represent possible objects of knowledge, on the syntax of its possible representations, limitations which make themselves felt especially in discourse purportedly about God.

But before we get too far ahead of ourselves, let me return, in light of our discussion of Maimonides' conception of logic, to our original question concerning the epistemological status of the study of language: is it or is it not a philosophical science? As we have seen, logic provides the inquirer with rules of discourse – specifically governing syntactic features of the thought expressed by external speech – which make it possible for him to engage in inquiry and, thereby, acquire knowledge about everything man can know. That is, logic provides the philosopher with the rules that govern rational inquiry, or science: rules of valid reasoning and rules to adjudicate between conflicting claims. But because such rules must be accepted in order for a given inquiry to be rational, or a science, they cannot be the object of scientific inquiry itself. At least for this reason, then, Maimonides explicitly adopts in the *Logic* the standard Aristotelian position that the art of logic, though not itself a science, "is a tool of the sciences ... [I]nstruction or study proceeds in an orderly manner only through the art of logic." The fact that Maimonides includes the subject of language in his account of *ma'aseh bereshit* should not, then, be necessarily taken to imply that its inquiry, logic, *is* a science in a narrow sense; that it is a "tool of the sciences" should also be sufficient to warrant its inclusion in *ma'aseh bereshit* – and especially since that chapter of the *Guide* covers not just

natural or physical science but also a good deal of philosophical anthropology.

There is also, it should be added, a second probable reason why Maimonides endorses the Aristotelian view that logic is not itself a "part," or branch, of science, a reason which is, however, Platonic or Stoic in origin rather than Peripatetic.[39] The question whether logic was a "part" or only a "tool" of philosophy or science was connected for the medievals with the question of the subject matter of logic. According to the Platonists and Stoics, each branch of philosophy or science must have as its subject matter a portion or aspect of being which it alone studies. Thus, as Maimonides enumerates in some detail in ch. XIV, physics studies material things that exist by nature (and not as artifacts), their properties, causes, and so on; divine science studies non-material entities, such as God and the separate intellects. Logic, on the other hand, has no such portion of external or extra-mental reality to call its own. For it is concerned only with inner and external speech, words and thoughts, and their inter-relation, not with the external extra-mental entities which such speech signifies.[40] Therefore, lacking such a subject matter, logic is not a "part," or branch, of philosophy or science proper. Yet, it is a "tool" of the sciences, both because it provides the rules of discourse – of reasoning or speech – essential to inquiry and also because it investigates certain notions and concepts indispensible for science which are not themselves investigated by any science. Thus the definition of universals, such as, species, genera, properties, essences, and accidents – topics which Maimonides takes up in ch. X of the *Logic* – might be argued to belong in the *Logic* for this reason.[41] Such universals, e.g. species, are only mental notions that do not exist outside of the mind, as Maimonides explicitly states in the *Guide*.[42] Therefore, because they do not exist in external physical or non-material bodies, they are not themselves the objects of physical or divine science. Yet they are necessary for proper study of external physical and divine existents; for, as Maimonides describes physical science in the *Logic*, ch. XIV, it studies material things "and all that exists in them, ... their accidents, properties, ..." Hence, the investigation of these notions lies outside of any science proper; instead it falls to logic which treats everything that is an essential instrument for pursuit of the sciences.[43]

Finally, there is perhaps yet a third reason why Maimonides locates the origin, or nature, of language within his esoteric account of *ma'aseh bereshit*, i.e. natural science. This reason concerns the nature of signification which brings us to the second of our earlier questions: What does Maimonides mean when he says that languages are "conventional" and not "natural"? Here again, Maimonides' scattered statements on this subject are best understood against the background of Al-Farabi's fuller discussion in his logical writings, especially in his *Commentary* on *De Interpretatione*. In the next section, I therefore briefly turn to Al-Farabi's theory of signification.

IV

The question whether the signification of words is natural or conventional is at

least as old as the *Cratylus* in which Socrates proposes, against those who hold that names designate simply as a result of agreement or convention, that "he who first gave names, gave such names as agreed with his conception of the nature of things."[44] However, it was within the Aristotelian tradition that this question was given its classic formulation which, in turn, informed its Islamic and Maimonidean discussions.

In the opening chapter of *De Interpretatione*, Aristotle distinguishes three symbolic relations that hold among four relata: (i) written inscriptions, (ii) utterances, (iii) "traces in the soul," and (iv) the extra-mental existents about which we speak or think. Written inscriptions symbolize utterances; utterances symbolize traces in the soul; and traces in the soul symbolize extra-mental existents. About the respective ways in which these symbols function, Aristotle further says that the modes of symbolization of written inscriptions and utterances are "not the same for all [speakers or linguistic communities]," while that of the traces in the soul, like the extra-mental entities they symbolize, is "the same for all." Finally, although he does not make it clear exactly how this is connnected to their mode of symbolization, he adds that the traces are "likenesses of" their referents, whether individual or universal.[45]

In the hands of Al-Farabi, the overall structure of Aristotle's conception remains the same while it undergoes several specific changes of terminology and content.

First, for Aristotle's "traces in the soul" (*ton en te psyche pathematon*), Al-Farabi now speaks of notions or meanings [*ma'ānī*][46] and sometimes of concepts or thoughts [*ma'qūlāt*], by both of which he typically means intelligibilia, i.e. intellected forms.[47] Moreover, because the intellect is a function of the mind, these notions or thoughts, like Aristotle's traces in the soul, are intended to be mental entities, i.e. entities whose existence, and not simply apprehension, is dependent on the mind.[48]

Second, Aristotle's general expression 'symbolize' is translated as '*dalla*' in Arabic, for which we shall use the term 'signify.'[49] Just as Aristotle uses the general term 'symbolize' to cover a range of different symbolic relations, so Al-Farabi uses the one term 'signify' for varied signification relations. He is, however, more critically aware of its equivocality and of the importance of distinguishing among the different relations it covers, especially the different ways in which utterances signify mental notions and mental notions signify extra-mental entities.

Furthermore, in addition to the three simple, or basic, signification relations enumerated by Aristotle, Al-Farabi also allows for a more complex mode of signification – through a chain – to account for what would in contemporary terms be considered *semantic* reference, signification by speech or language of extra-mental entities. In Al-Farabi's own words, "speech signifies *in the first place* thought in the soul, where 'in the first place' means 'without anything in between'. ... [and] *in the second place* the sense-objects which the thoughts are thoughts of, which means that the thoughts are in between" (*C.* 24.15–25; my emphasis).[50] To introduce a term of art, let us say that words, or speech, *designate* the extra-mental objects which, in Al-Farabi's terminology, they

signify in the second place. For semantic purposes, i.e. to determine the conditions under which sentences or utterances are true or false, this relation of designation is, of course, the primary relation. What Al-Farabi means when he says that designation is signification "in the second place" is not that it is secondary but that, insofar as the thought is "in between" (29.21–24) the signifying word and the signified object, this mode of signification is *complex* and *indirect*, i.e. compounded from the two more basic, direct signification relations between speech and thought and between thought and object. I will return below to the importance of this feature in Al-Farabi's theory of signification.

Third, where Aristotle distinguishes speech/thought signification from thought/object signification by saying that the second but not the first is "the same for all," Al-Farabi substitutes the distinction between the natural and the conventional. These terms in fact, however, mark off two quite different, though parallel, distinctions for Al-Farabi. And, because of their importance for our later understanding of Maimonides, it is important to note the differences between the two distinctions.

Commenting on Aristotle's statement that "what comes out in the voice [i.e. the utterance] is not the same for [all]" (16^a5–6), Al-Farabi writes that the philosopher intended to say that "its signification is based on convention" (*C* 27.5). For

> [i]f man had been given his expressions by nature they would be the same for all communities, just as the thoughts expressed by different languages are the same with all communities, and just as the sense-objects which these thoughts are thoughts of are also common to all communities.

Here the natural is that which is originated by and from nature. And because nature remains the same across communities, what is natural is ipso facto universal or holds in all communities. What is conventional, however, is contingent on, and specific to, the particular community in which it is introduced and, therefore, varies from community to community.[51] In the first sense of the distinction, then, to say that speech/notion signification is conventional, as opposed to natural, is to describe the genesis, or causal origin, of the institution, namely, that it is not a natural regularity, a product of nature, but an artifact, the creation of the will of some human. As Al-Farabi later describes the signification of words "by convention and legislation": "communities have their expressions prescribed for them, just as they have the laws concerning their conduct prescribed for them." (*C* 27.12–15). In contrast, the signification of words *would* be natural (in this sense) if they were somehow genetically endowed, or if they naturally evolved from grunts and cries humans instinctively emit. Along this line, Al-Farabi argues (against the Hellenistic commentators) in defense of Aristotle's allegedly redundant statement that nouns are conventional (16^a27–9) that, if the genus of expressions were taken to include all complex sounds composed of letters, then "the sounds [birds and other animals] produce [would also be] expressions [and not simply sounds, as

the commentators claim], even if <composed of> letters we do not happen to know." But such animal expressions, he points out, are surely "not based on convention"; rather the animals have been "endowed with" them or "given [them] by nature" (*C.* 31.18–24). Hence, even in such circumstances, human expressions would remain the only *conventional* expressions.

In this first sense, the claim that the signification of external speech is conventional *only* means, then, that which particular thoughts are signified by which expressions of speech is not fixed by nature – physical or biological nature – but by human decision, or legislation. It does not imply that this signification relation is arbitrary, or without any reason or explanation – no more than the fact that political laws are conventional and legislated implies that they are arbitrary. In fact the very opposite should obtain. For if, contrary to Al-Farabi, signification did spontaneously grow out of natural cries like those produced by animals, it ought to be possible to give a causal explanation of its genesis and development which did not make reference to reason or rational deliberation. Precisely because it is claimed that signification did result from acts of human decision, one would think that it *would* be rational; for humans are rational agents and act for reasons, or so any Aristotelian would argue.

This conventional process by which words come to signify their particular notions is described in the greatest detail by Al-Farabi in his *Book of Letters* (*Kitāb al-hurūf*).[52] There he distinguishes two stages in the emergence of linguistic conventions governing signification. At the first stage, random individual speakers, who until then used bodily gestures to signify their images or perceptions of sensible objects, spontaneously begin to use speech-sounds in order to signify notions or things. These initial uses of speech-sounds are entirely idiosyncratic. However, on occasion one individual speaker's use of a speech-sound for a particular object is heard, retained, and re-used by another speaker (e.g. an addressee) to designate the same thing in *intended conformity* with the first speaker's use. Under those circumstances, Al-Farabi says, the two speakers have "formed a convention" and "reached an agreement" about the signification of the word; i.e. they have come to share mutual beliefs and expectations about each other's regular use of the same sound.

To spell out this first notion of convention more explicitly: when any two speakers X and Y use the same sound S to signify the same notion N, and X uses S because he believes that Y believes that it signifies N and because he believes that Y uses S because he (Y) believes that X believes that it signifies N; then X and Y participate in a conventional use of S, i.e. a use of the sound that follows a regularity based on shared expectations and beliefs (about each others' expectations and beliefs).

This kind of conventional use continues, according to Al-Farabi, until the use of a particular word with a particular signification spreads through the whole community. Note, however, that at this first stage those who initiate the conventions or agreements that fix the significations of words are random members of the community acting in random circumstances. No explicit agreements or legislative meetings are deliberately convened for this purpose.

Only at a second stage does Al-Farabi describe acts of a word- or "law-giver"[53] who governs the affairs of the community, who systematically introduces new sounds for notions which lack them, and who explicitly, deliberately attempts to remedy gaps in the national vocabulary – until words are coined for all notions necessary for practical and theoretical life. Unlike the first stage, the introduction of words at this second stage, according to Al-Farabi, follows a fixed, rational order: first, names are coined for theoretical objects commonly believed to cause our perceptions; second, names for objects we infer from beliefs involving the first objects; third, names for activities that result from endowed faculties; fourth, names for habits and states that result from those activities; and so on.

Even less than the first stage, then, this second explicitly legislative stage is hardly arbitrary, without reason, or unsusceptible to explanation. Like all, or most, matters of legislation, the rules of speech/thought signification are, of course, (metaphysically) *contingent*; it is possible for them to have been otherwise and for the same sounds to signify different thoughts in different communities. But to say that stipulations of signification are contingent is not to say that they are arbitrary or random. Legislation does presuppose a legislator, i.e. an agent with a will, but not all Will is *opposed* to Wisdom.[54]

Al-Farabi's hybrid description of the conventional origin and evolution of linguistic signification – his division of the process into two stages and, even more important for our purposes, his description of the first stage as a matter of coordinated use of the same sounds by individuals to signify the same things – enables him to avoid a classic objection to conventionalist theories of the origin of languages, an objection which we have already mentioned is raised by Halevi in the *Kuzari*.[55] Halevi, you will remember, concedes that language must have been temporally originated by an agent and can be neither a product of nature alone nor eternal. But he finds it impossible to conceive of how any *single human* agent could have succeeded in imposing his language, his schema of signification, on a whole community. Therefore, Halevi concludes, God must have originated language. Now, Halevi's worry here is not simply the apparent tyranny of such a giver of words, nor the lack of historical evidence for any original act of legislation or communal agreement. Rather, as many contemporary philosophers have pointed out, the idea of *explicit*, *deliberate* legislation or convention by an agent (which is essential if the idea of convention is to have any explanatory power) presupposes the existence of a language in which the conventions and rules are stated; yet it is this very language whose origin the conventions and legislations are meant to explain. Al-Farabi's description nicely avoids this vicious circle. For, at the first stage, the crux of the agreement or convention consists in the coordination of shared beliefs so as to effect a regularity of use of the same sounds. At this stage, there need be no explicit or deliberate legislating of rules. Only at the second stage is there such explicit, deliberate rule-giving by a governor of the community. However, by this point there presumably already exists sufficient language to frame the rules and conventions without begging the question.[56]

The second sense in which Aristotle holds that speech/thought signification

is conventional and thought/object signification is natural concerns the *mode* by which the sign signifies the signified. In this second sense of the distinction, Al-Farabi emphasizes that both relations are homonymously called by the Hellenistic commentators[57] by the name 'signification,' but

> ... it is clear that the thoughts ... do not signify sense-objects in the same way as speech signifies thought. If they can be said to signify at all, they merely convey the sense-object's essence or some other aspect that can be conveyed. Expressions, on the other hand, signify by virtue of being common signs. When someone hears them, the thing of which the expression in question has been made a sign actually comes to his mind. This is all there is to their signification. They are similar to other signs man creates to remind him of what he needs to remember ... But the way thoughts convey entities outside the soul is not signification in this sense, and it should not be put on a par with the way expressions signify referents. (*C.* 25.5–13)

Al-Farabi's conception of thought/object signification in this passage is a reformulation of Aristotle's description of thoughts, or traces in the soul, as "likenesses" of their corresponding extra-mental objects. Although Aristotle himself did not elaborate the nature of this "likeness," Al-Farabi explains that the Hellenistic commentators took it to be a case of signification (*C.* 28.4–9). Unfortunate as the commentators' choice of the term 'signify' for this relation may have been, Al-Farabi primarily wishes for us to keep in mind the conceptual difference between the thought/object relation, call it what you will, and speech/thought signification. For the former is a type of signification by nature and the latter, a type of signification by convention. In the first case, the thought "conveys the sense-object's essence" or some other uniquely identifying "aspect" of its nature, and the object is signified by the thought in virtue of being the unique bearer of that essence or because it is uniquely identified by the aspect. That is, a thought, or the thought-component corresponding to an individual expression, is *representational*; it possesses content – it expresses the "nature" of the extra-mental referent – and it signifies its object *by* representing or, equivalently for Al-Farabi, picturing it (*C.* 28.6–9). Linguistic expressions, on the other hand, are "common signs" which signify, or signal, a mental entity – thought, image, or concept – by some form of psychological association "created," or induced, by their human users' prior experience. Hearing a particular expression causes the subject to bring to mind a particular notion with which it is associated, either by deliberate human design or by the habits of experience. That is, a word signifies, or signals, a particular thought in the way that a string tied around my wrist signals – and thereby reminds – me to telephone home. In some of these cases, the signalling is more conventional, e.g. when a toot reminds, warns, or signals a hearer of an oncoming train. In other cases, it is more natural, e.g. when smoke warns us of fire. But in none of these cases is the sign a content-bearing representation of the signified entity. Only in virtue of some psychological relation established between the two in the subject's mind does the presence of the first make the second "actually come to his mind" and thereby signify it.

In this second sense of the natural/conventional distinction, thought/object signification is natural, not because it is a product of nature or endowed in speakers by nature, but because it *reflects* nature, i.e. because the content of the thought expresses the nature of the object it signifies. Analogously, speech/thought signification is conventional, not because it originated in an act of legislative convention or in mutually conforming expectations of members of the linguistic community, but because sounds simply serve, in varying degrees, as commonly shared signals of thoughts for speakers.

Furthermore, in this second sense of the natural/conventional distinction, it should be emphasized that it is only what speech signifies *in the first place*, namely, the mental notion, which is conventional. What speech signifies *in the second place*, or semantically *designates*, is always in part natural. For, as we mentioned earlier, Al-Farabi's account of speech-object designation, the true semantic relation, makes it into an indirect, two-stage relation. First, the linguistic expression directly signifies a mental notion – by an association which is conventional in that (1) it originates in communal conventions and (2) it consists simply in the one signalling the other. Second, the mental notion then directly signifies an extra-mental object by a relation which is natural, again, in two ways: (1) it is common to all humans by nature and (2) the notion is a representation via the nature (essence or uniquely identifying aspects) of the signified entity. The relation whereby the linguistic expression *designates* the extra-mental entity is, then, a complex indirect relation compounded from these two simple direct relations. But because it contains both stages, one of which is conventional, the other natural, the complex relation itself should be described neither as simply conventional nor as simply natural.

It is especially important to keep these two signification relations conceptually distinct because, as Al-Farabi already observes, even Aristotle at times speaks of an "expression signifying by convention" (16^a19–20) without stating whether this is signification of a *mental notion* or of an *object*.[58] Of course, one can still *label* speech/object signification 'conventional' if all that is meant is that the complex chain is *not thoroughly* natural, that it contains *some* conventional element. But failure to distinguish the thought/object signification component in the complex chain can easily lead one to infer invalidly either that the whole relation is conventional (just because the first stage is) or that it is all natural (just because the second stage is). In his commentary on Aristotle's statement that "every sentence is significant ... by convention" (17^a1–2), Al-Farabi seems to anticipate, and counter, these mistaken moves.

For the reason that simple words are never directly associated with their extra-mental objects, Al-Farabi distinguishes his account from two opposing views both of which hold, though on different grounds, that words signify objects by *themselves* expressing the nature of their referents. The first of these is, not surprisingly, the Platonic view that words by nature "agree with" their referents. The second view, however, is less obviously at odds with Al-Farabi's own position. Words, on this view, "are tools formed intentionally" and, like any tool, a word is "built and formed that the operation which one seeks to carry out with it issues from it," e.g. the drill for drilling. Thus, an "expression,

being a tool of the faculty of reason and speech, must have a form which by itself reveals the object signified, which it can only do by imitating it" (*C.* 50.1–15), a claim that Al-Farabi illustrates with examples of onomatopoeia.[59] Now, at first sight, it may be puzzling that Al-Farabi criticizes this words-as-tools view; Aristotle, after all, also holds that words are human artifacts and, therefore, instruments whose form must somehow serve their function. The real point of disagreement, it seems, is not over the artifactual/natural distinction (the first sense of the distinction) but over the question whether signification is a one- or two-stage relation. According to the words-as-tools proponents, the linguistic expressions *themselves*, the concrete words, letters, shapes, and sounds of external speech, directly "imitate" the natures – essences or identifying aspects – of their referents; hence, the examples of onomatopoeia. Against this view, Al-Farabi does not really give any substantive argument other than to assert that it is "evident that primary words do not imitate a referent or one of its accidents in the least" (*C.* 51.3–6); that is, it is simply too obvious to Al-Farabi to *need* argument that, apart from a few examples of onomatopoeia, the concrete words themselves cannot plausibly be thought to imitate their referents. But, by denying word-object imitation, Al-Farabi also does not intend to imply that word-object designation is purely arbitrary; rather the crux of his denial is that designation is not a direct one-stage relation between the word and object but an indirect two-stage relation mediated by the mental notion or thought. For Al-Farabi, there remains a type of natural signification – "imitation," if you will – but it holds between the mental notion and extra-mental object, not between the word and object. This second alternative fails, then, to acknowledge the proper place of natural signification in designation because it does not recognize the role of the mental notion in the complex relation.

The second view Al-Farabi counters also holds that the mode by which a given category of linguistic expression designates its extra-mental referent is natural because they resemble one another. This second view does not claim, however, that *all* categories of linguistic expressions, or external speech, "imitate" or "follow" reality; it restricts its claim to sentences and to one sentential feature, their "composition" (*ta'līf*) (*C.* 50.18), by which, as we explained in the previous section, Al-Farabi means their logical form or structure.[60] Now, Al-Farabi does not deny that there exists the alleged resemblance; on the contrary, he finds this view "more satisfactory because we do compose sentences out of expressions signifying parts of the compound affair signified by the sentence" (*C.* 50.20). The problem he faces is to reconcile this recognizable correspondence, or resemblance, between sentences and states of affairs with Aristotle's claim that sentences as well as single expressions are none the less conventional. His solution, in brief, is that the two – imitation and conventionality – are not incompatible. To show this, he first argues that the imitation in question is merely contingent:

> The composition of sentences is not of the same kind as the composition of affairs. It has been agreed that a composition of such and such a kind should signify the composition of a certain state of affairs. [But] if one gave sentences another pattern of composition and agreed that it should signify the same composition of affairs, the new pattern would signify it just as well as the first. The imitation of the composition of referents through the composition of expressions is a matter of convention. It has been agreed, as it were, that the composition of a sentence should imitate that of an affair, but not as though it were of the nature of affairs to resemble in their composition the composition of expressions. <The idea was not that the resemblance should be a natural one, but that it should be established> by convention. Mutual imitation of similar things is imitation by nature. But the imitation by which the composition of expressions imitates a particular composition in a referent is imitation by convention.

Although there is a perceived resemblance, or imitative relation, between the structure of a sentence and the structure of its corresponding extra-linguistic state of affairs, Al-Farabi claims that the two structures are none the less not of "the same kind."[61] If they were, their resemblance, or imitation, would be natural and, consequently, "mutual," i.e. symmetrical. Instead their resemblance is asymmetrical: the structure of a sentence resembles the structure of reality, but the structure of reality does not resemble the structure of the sentence. And this, Al-Farabi explains, is because their resemblance is conventional. Furthermore, our perception of resemblance is the *effect* rather than the *cause* of our practice of linguistic signification. It is only because we have agreed or conventionally decided that the sentence will designate the state of affairs that we, in turn, perceive the structure of the former as resembling that of the latter. Were our linguistic conventions different – for example, were we to decide that sentences with a different structure should designate that given state of affairs – we would still see a resemblance – a different one – between the new sentence and reality! Thus the fact that the sentence structure resembles the structure of the state of affairs it signifies is no proof that their semantic relation is not conventional; convention not only arises from design but creates it.

Finally, let me conclude this section with some brief remarks comparing Al-Farabi's theory of signification with certain contemporary views in the philosophy of language. Because Al-Farabi holds that words themselves are never directly associated with extra-mental existents, the sense in which he claims that signification is conventional is not the same sense in which, say, John Stuart Mill and various contemporary philosophers have claimed that a word is a conventional label directly pinned onto the object to which it refers without the mediation of any meaning or concept.[62] For Al-Farabi, all that is a matter of convention is which mental notion is associated with which word. It is not at all a matter of convention which object is 'associated" with which concept; that association is "naturally" determined by the essence or properties "conveyed by," or contained in, the notion. Moreover, although Al-Farabi never explicitly puts it in these terms, it is presumably *because* the speaker

knows the notion associated with the word that he is able to refer to a particular individual with that word.

The position among modern philosophers of language to which Al-Farabi's is closest is that of Frege (or later Fregeans like Carnap), for whom signification, or reference (*bedeutung*) by name to object, is always mediated by a concept, or sense (*sinn*), which expresses, or contains, a uniquely distinguishing set of features of the extra-mental object to whom the word refers.[63] Frege and Al-Farabi would presumably disagree over the types of features that constitute the concept or notion that does the second stage of significational work, and they might also differ on the individuation of a concept or sense. They would certainly disagree over its ontological status. For Frege these concepts are abstract non-mental entities, for Al-Farabi they are mental entities. This difference is significant but it should not obscure what they have in common: the essential intermediate role of the mental notion in designation, an idea that is then taken over and developed by Maimonides.

For Maimonides, the intermediate role of the mental notion in designation raises a further difficulty which Al-Farabi does not address and which is, perhaps not surprisingly, similar to a difficulty that has been raised against Frege by some contemporary critics. If, as Frege claims, a speaker's use of a name refers to an object only because he associates with the name a sense, or qualitative description, which uniquely identifies the object, then the typical speaker must be virtually omniscient in order to be able to refer to the many objects to which he successfully refers; for he must know sufficiently rich true descriptions of all his intended referents. Yet, despite our ignorance of such uniquely identifying descriptive characterizations of the referents of many of our names, we typically do succeed in referring to them. For Maimonides, an analogous problem arises, not for our names of natural or terrestrial objects, but for our names designating the deity.[64] Given the essential intermediate role of the mental notion in designation, what is required of the speaker who purports to refer to God is knowledge of uniquely distinguishing characteristics of the deity. However, such knowledge may lie beyond the limits of human intellectual apprehension – in which case it is unclear how we can refer to God. In the final section of this paper, I will return to this difficulty – of which I think Maimonides was also aware. In the next section I will first reconstruct Maimonides' theory of signification against its Al-Farabian background.

V

Let us return to our starting point: Maimonides' succinct comment that Genesis ii:20 "*And the man gave names, and so on* ... informs us that languages are conventional and not natural, as has sometimes been thought" (II:30:357–8). As biblical exegesis, Maimonides' ground for this claim is the fact that Scripture states that the giver of names was "the man" (*ha-'adam*), not God. Viewing this scriptural inference from his Aristotelian perspective, Maimonides transforms it into the thesis that language or, more specifically, the

signification of names is conventional and not natural in the first of the two senses of this distinction. That is, language is a human artifact, the result either of an "agreement" among ordinary speakers or of a legislator's explicit decision. In the first case, "the man," *ha-'adam*, stands for the general human species, or perhaps the multitude, who spontaneously produce the first sound-meaning correlations which eventuate in the coordinated regularities which constitute the linguistic conventions in the first of Al-Farabi's two stages of linguistic evolution. In the second case, "the man," *ha-'adam*, stands for the individual Adam, the first ruler and legislator who enters at Al-Farabi's second stage.[65]

In the same vein, the opposing philosophical position that language is natural, the position Maimonides denies, would seem to be the Epicurean view that human languages, like animal sounds, grew spontaneously out of sounds "given [humans] by nature." Although Maimonides does hold, as we mentioned earlier, that the *faculty* of speech, "speaking with the tongue," is a species-specific property of a human being, naturally endowed in him as a function of his rational form, in the very same passage he emphasizes that what distinguishes the particular language Hebrew as "the Holy Language" is a function of the significations of its words which were "laid down" (*wuḍi'at*), i.e. conventionally introduced.[66]

What is most interesting about Maimonides' commentary on *Genesis* ii:20 is its implied identification of the divine and the natural.[67] For Maimonides takes the scriptural implication that it was not God who gave names to mean that language is not natural. Earlier, in Part I, we showed how Maimonides rejects all divine, i.e. *super*natural, conceptions of language: all literal scriptural suggestions that knowledge and use of language, or of any particular language (e.g. Hebrew), can be ascribed to God. Here he also denies that language is divine in the further sense that the signification of its terms is *natural*, i.e. the product of physical or biological processes alone. Instead, Maimonides holds that language is the product of human will and design. However, as with Al-Farabi, this is not to say that linguistic signification is arbitrary, random, or unsusceptible to naturalistic, causal, or rational explanation. As we alluded earlier, Maimonides allows for the causal effect of physical environment and human physiology on language and, in his interpretation of the scriptural story of Babel, hints at geographical causes for the diversification of human languages.[68]

The sense, then, in which Maimonides claims in the *Guide* II:30 that "languages are conventional and not natural" is the first of the two senses which Al-Farabi gives to the conventional/natural distinction. What now is Maimonides' position with respect to Al-Farabi's second version of the natural/conventional distinction, the version which concerns the mode by which linguistic signification functions rather than its origin? Does Maimonides share Al-Farabi's view that speech/object signification (designation, "what speech signifies in the second place") is a complex two-stage relation whose first stage (speech/thought signification, "what speech signifies in the first place") is conventional but whose second stage (thought/object significa-

tion) is natural? Does Maimonides follow Al-Farabi's emphasis on the intermediate role of the mental notion, or mental representation, in the speech/object signification relation? Is there any textual evidence that Maimonides, like Al-Farabi, held that a name designates its bearer only in virtue of the fact that the existent bears, or possesses, the essence or distinctive properties expressed in the mental notion conventionally associated with, or signalled by, the name?

Nowhere, to my knowledge, does Maimonides explicitly draw Al-Farabi's distinction between the two stages of designation nor does he anywhere elaborate his view of the conventionality of signification (in Al-Farabi's second sense). None the less, we can see – quite clearly, I think – that he was working with Al-Farabi's conception of signification from one argument he presents, an argument which is especially interesting because it involves a case of *failure* of linguistic signification.

In the last paragraphs of his last chapter on divine attributes in the *Guide*, chapter I:60, Maimonides argues that a person who affirms that God has positive attributes does not simply have a false belief about God; rather, "he has abolished his beliefs in the existence of the deity without being aware of it" (I:60:145). This person knows nothing about God "except the mere *term* [God]" (my emphasis). Moreover, he applies the affirmative attribute, not to God (as he imagines because he uses the name 'God'), but to some *other* object which is, furthermore, itself nonexistent (or, if you will, to nothing); i.e. this other thing is "an invention that is false; for he has, as it were, applied this term to a notion lacking existence, as nothing in existence is like that notion" (I:60:146).[69] Here Maimonides, like Al-Farabi, assumes that what determines which extra-mental referent is designated by a given speaker's use of a linguistic expression is the mental representation [*taṣawwur*] he associates with the expression. This representation, or notion [*ma'na*], is composed of attributes – either essential attributes or others that in fact distinguish the referent from other objects – which the individual *believes* are possessed by the object which he purports to designate with the expression. However, once this representational notion is associated with the expression, it then signifies who or whatever in the universe, existent or imaginary, *in fact* possesses the attributes in question – regardless of the speaker's referential intention.[70] Therefore, even if a speaker uses a given name intending to designate a particular object and, with that intention, associates with the name a representation which he imagines represents the object; if the object does *not* in fact possess the attributes expressed in the representation, the name does not designate it.

But what does the name then designate? Maimonides distinguishes two cases of this kind. In the first case, the individual "apprehends part of the [true reality of some matter] and is ignorant of another part," for example, he apprehends in the notion of a man the necessary concomitant of rationality but not his bipedity. Such an individual, Maimonides says, has a partial understanding of the term 'man.' So long as he apprehends "something of [the signified extra-mental entity] as it really is" – and presumably Maimonides means here not just something but something sufficient to identify the referent – even though

the rest of his apprehension "is different from what that thing really is," the speaker succeeds in signifying the intended referent; his apprehension is *of that very thing*.[71] If he states, for example, that men are three-legged, he has said something false but *of* men; in Maimonides' own words, he "falls short" of apprehending the true reality of the entity but his apprehension, though only partial, is *of that entity*.

In Maimonides' second case, the individual has either a false categorical belief about the intended referent – for example, he believes that taste is a quantity – or a set of jointly incoherent beliefs with which he represents the purported referent – for example, he thinks that an elephant "is an animal possessing one leg and three wings, inhabiting the depths of the sea, having a transparent body and a broad face like that of a man in its form and shape, talking like a man, and sometimes flying in the air, while at other times swimming like a fish" (I:60:146). Of the first individual, Maimonides says that "he is ignorant of the being of taste and does not know to what the term applies"; of the second: "I will not say that this representation of the elephant differs from what the latter really is, nor that the man in question falls short in his apprehension of the elephant" (Ibid.). Rather, given his incoherent representation, the term designates "a thing lacking existence to which a term signifying an existent thing has been applied" (Ibid.); that is, the individual does not have a *false* belief *about* taste (or elephants); he has no belief *about taste* (or elephants), period, because his representation, despite the name with which it is associated, signifies some *other* entity, which, at least in these cases, also happens to be an "invention," a thing lacking existence to which a term signifying an existent thing has been applied" (Ibid.).[72]

The same holds, Maimonides argues, for the individual who believes that the deity – the necessary existent and, therefore, absolutely simple being – possesses affirmative attributes. Because we can demonstrate that it is impossible for the thing thus imagined to exist, the associated representation is logically incoherent; therefore, even though we *call* the bearer of this essence 'God,' "we apply this term ['God'] to absolute nonexistence," the null entity, as contemporary logicians would say. This individual who "affirms that God ... has positive attributes .. has *abolished* his belief in the existence of the deity without being aware of it" (1:60:145). He does not have a false belief *about God*; he no longer has any belief, *true or false, about God* at all.[73] For the entity signified by the name is that which fits the properties expressed by the mental representation associated with the name, and because the set of properties in question is logically incoherent, the signified entity must be some impossible though imagined entity, not God.

Throughout this argument, it should be evident that Maimonides assumes the Al-Farabian account that a name designates its extra-mental referent only by way of the intermediate mental representation, or thought-element, directly signified by it. The only apparent difference between Al-Farabi and Maimonides seems to be in the degree to which they take the name-representation signification-relation to be *individualistic*. For Maimonides, much more so than for Al-Farabi, the representation which is signified by one's use of a given name

seems to be entirely "up" to the individual speaker to fix, regardless of communal or social conventions governing the name. In any case, however, it is the mental representation, or thought-notion, which carries the real burden of the designation-relation and this stage is anything but arbitrary or accidental: the entity signified by the representation or notion – and thereby designated by the name – is whatever possesses the attributes it expresses. As in Al-Farabi's theory, at this stage, signification is by nature, not convention.[74]

Where Maimonides most differs from Al-Farabi is not in his theory of signification per se or in his actual account of external or internal speech, but in the use he makes of these. As I noted toward the end of Part III, Maimonides treats internal speech, though composed of intelligibilia and images rather than sounds and letters, as a self-sufficient *language* in its own right. This is to say two things. On the one hand, it is to treat these mental notions of thought as an ontologically independent representational system which, especially for the purposes of theoretical inquiry, is the superior system in which it would be preferable to express oneself – *independently* of and *rather* than with the words of outer speech. On the other hand, by conceiving of this system of mental representations, or thought, as a *language*, Maimonides breaks down the sharp conceptual difference between external and internal speech, between language and thought, which Al-Farabi and he himself in the *Logic* had insisted upon. Internal speech, or the language of thought, is now made subject to the same kinds of problematic features as external language. While the system of mental representations is still preferable to the utterances of external speech for purposes of intellectual apprehension, even it turns out now to be inadequate to express certain kinds of truths and to guide inquiry in certain areas.

Maimonides' conception in the *Guide* of inner speech as a language has, then, two sides to it. Both of these can already be glimpsed in the opening paragraph of ch. I:50, the introductory chapter to his extended discussion of divine attributes, where Maimonides first sets up the contrast between thought and language, or mental representations and utterances:

> Know ... that belief is not the notion [*ma'nā*] that is uttered but the notion that is represented in the soul when it has been averred of it that it is in fact just as it has been represented. If you belong to those who are satisfied with expressing in speech the opinions that are correct or that you deem to be correct, without representing them to yourself and believing them, ... you take a very easy road ... as if what we aimed at and investigated were what we should say and not what we should believe. For there is no belief except after a representation; belief is the affirmation that what has been represented is outside the mind just as it has been represented in the mind. (I:50:111)[75]

Here Maimonides' primary concern is with the objects of belief, the bearers of truth, and, thus, the objects of theoretical inquiry. These, he emphasizes, are "the notion represented in the soul," mental representation, as opposed to "the notion that is uttered." For example, given divine unity which excludes the

existence of divine essential attributes, anyone who 'believes' that God both is one and possesses essential attributes, in fact only "says in his words that He is one, but believes him in his thought to be many" (Ibid.). One should rather seek the correct mental representation of the reality and, *where necessary* – i.e. except in those rare circumstances where the words do suffice to express the thought – limit himself to expressing the truths in question with the mental representations of inner speech without putting the thoughts into words. Then and only then

> you shall be one of these who represent to themselves the *Unity of the Name* and not one of those who merely proclaim it with their mouth without representing to themselves that it has a meaning ... Men ought rather to belong to the category of those who represent the truth to themselves and apprehend it, even if they do not utter it, as the virtuous are commanded to do – for they are told: Commune with your own heart upon your bed, and be still [*ve-domu*]. Selah." (Ps. 4:5)

The contrast Maimonides draws here is not between utterance and "stillness" [*demamah*] as the *absence* of all language or representation – for example, the type of emptiness or blankness of mind which mystics seek to induce – but between two types of language or representational systems corresponding to the distinction between external and internal speech, between "verbal language that is uttered and spoken with the lips" and the mental representations, or intelligibles, that are the objects of intellectual apprehension. Like the celestial spheres whose vehicles of speech consist entirely of mental representations, Maimonides tells his reader that "silence and limiting oneself to the apprehensions of the intellects are more appropriate" (I:59:139).[76] Here, again, "silence" does not refer to the vacuous state of mind but to representations of the mind, representations which are further limited here to those which fall within the apprehension of the human intellect, thereby excluding metaphysics. In neither of these passages, admittedly, does Maimonides absolutely exclude the possibility of expressing the truths in question in external speech but he does explain that in each such attempt "we find that it can have some application to Him ... and on the other we perceive in it some deficiency" (I:59:139). That is, all such attempts to express the truth about the deity in external speech approximate but invariably misrepresent it. Unlike his more optimistic earlier attitude in the *Logic* which held that, under the guidance of logic, it should be possible to make any statement "expressed by the tongue conform to what is in the mind," here in the *Guide* the prospects for bringing external speech into line with internal speech, and specifically with respect to metaphysical subject matter, are much dimmer.

These dim prospects hold, moreover, not simply for the vulgar language of the multitude, the "language of the sons of man" (*leshon benei 'adam*). The same kinds of limitations and inadequacies hold at a more abstract level for the inner language of thought in which philosophers express their interpretations of Scripture which specifically make claims about metaphysics or divine science.[77]

These mental representations are still, of course, "closer to the truth" and far less subject to errors than external speech, but they are none the less subject to some of the same kinds of misrepresentation.

To support this two-sided picture of internal speech, I turn for the remaining pages of this paper, to a more detailed discussion of its theoretical inadequacies – one due to Maimonides' conception of logical syntax, the other to his theory of signification. The text for this sermon will be a paradigm of the type of philosophical clarification of external speech in internal speech – through regimentation according to the rules of logic – which Maimonides describes in the *Logic*: his discussion of divine attributes in chapters 50 through 63 of the First Part of the *Guide*.

VI

Maimonides' account of divine attributes moves through a series of increasingly more sophisticated and "dialectically progressing"[78] solutions to the problem, or problems, posed by divine attributes. The opening chapter I:51 sounds two themes central to understanding the structure of the argument that follows. First, Maimonides claims – perhaps in a fit of exaggeration, though nothing could better convey the spirit of his position – that the denial of essential attributes to God is a primary intelligible, so "clear and manifest" to reason that had man "been left as he [naturally] is, he would not have needed a proof" of it (I:51:112). Second, Maimonides explains that it is none the less at present necessary to demonstrate this primary intelligible because of the accumulative effect of human error, mass adulation of the written word, and human inclination toward the familiar and the habitual. In particular, people so widely believe nowadays that God possesses essential attributes because "the books of the prophets and the revealed books existed, which predicate attributive qualifications of Him ... [and] these were taken in their literal sense; and He was believed to possess attributes" (I:53:119; cf. also I:51:114; I:31:67). Now, these two themes suggest two questions about divine attributes, both of which are semantic or logical – i.e. questions concerned with the meaning or interpretation of the language of divine attribution as distinct from the purely metaphysical question whether it is possible for a deity to possess attributes. Maimonides answers the metaphysical question simply and unequivocally in the negative; however, he shuttles back and forth between the two semantic questions for the bulk of his account.[79] The first of these two semantic questions, which is an "exegetical" question, asks: How should we interpret the various statements in Scripture which predicate affirmative attributes to God? The second, which is "normative," is the question: Can one (if at all) make philosophically acceptable statements in which attributes of any kind are truly predicated of God? Or, more generally, what would be the possible form and content of true statements "about" God?

Maimonides addresses both of these questions in chapters 51–63, although the answer to the first question is given the more explicit treatment, and for the most part we are left to infer the answer to the second.[80] Moreover, and most

important, he gives different answers to the two questions, a difference which specifically centers around the different truth-values the answers place, respectively, on propositions about God utilizing negative attributes. The answer to the exegetical question is that, of the various ways to interpret literal affirmative divine attributions in Scripture – say, as indicative of divine perfection or as attributes of action – the "correct description" (I:58:134) is through negations. However, the answer to the normative question, or so I shall argue, is that, while negative descriptions of God are preferable to affirmative ones, they also entail that God is composite and, therefore, they also fail to express truths. From the normative perspective, only a completely non-attributive mode of designation of God – of which Maimonides attempts to give us three examples – could truly avoid the problems raised by divine attributes.

One might also describe the difference between the respective answers to the two questions, the exegetical and the normative, as two ways of reading chapters I:50–63 of the *Guide*. The answer to the first question, which tries to "save" Scripture and, hence, the Law, from its own appearances, can be understood as the external meaning of this section, i.e. the meaning which "contains wisdom that is useful in many respects among which is the welfare of human societies." The answer to the second question, on the other hand, would seem to be the internal meaning of the *Guide*, i.e. the interpretation which "contains wisdom that is useful for beliefs concerned with the truth as it" (I:Introduction:12). Both answers agree that negative descriptions are *superior* to affirmative ones; the question which divides them is whether the negations are not merely better but *true*. Maimonides' answer is: Yes and No. Yes, at the external level, No at the internal level. Let me now turn to the texts and arguments that support these claims; because the exegetical answer is more widely known, I will concentrate on the normative answer.

Maimonides' discussion of the normative question begins only in the second half of I:53, after he has argued that, because God cannot possess either essential or non-essential attributes on pain of violating His internal unity, or non-compositionality, all scriptural attributions to God should be understood either as attributions of divine actions – which he later identifies with the domain of natural science (I:54) – or as indicating [God's] perfection according to what we consider a perfection (I:53:119). Having explained away Scripture, Maimonides then turns to those who believe that there exist the four divine essential attributes (mentioned above) which are "cognized by the intellect" independently of Scripture; namely 'living,' 'possessing power,' 'possessing will,' and 'possessing knowledge.' As a first stab at these, Maimonides proposes that, while they do not signify actions, they are often "thought of in reference to the diverse relations that may obtain between God ... and the things created by Him" (I:54:122). This interpretation, however, is inadequate, and Maimonides knows it: it avoids the problem of divine compositionality only at the cost of contradicting Maimonides' earlier claims that, for reasons of divine incomparability, there can exist no relations between God and creatures (inasmuch as relations hold only among members of one species).[81] Not surprisingly, then, this first solution is pursued no further.

When Maimonides next takes up the normative problem of divine attributes, after an exegetical digression to explain the scriptural attributes of action (I:54), he immediately addresses negative propositions about God. All attributes that entail either that God is corporeal, that He possesses affections, that He is subject to a privation, that He is only in potentia in any respect, or that there exists any likeness between Him and creatures – all of these should be negated of the deity. However, these negative propositions, discussed in this chapter which is called an "introduction" (I:55:129), Maimonides says, differ from the negative attributions to be discussed in the following chapters in one important respect. The absurdities that necessitate the denial of all the attributes discussed in this chapter are said to be "useful teachings of natural science" (Ibid.); the problems that give rise to the solution in terms of negative attributions in the coming chapters will "be understood only by someone who already possesses knowledge of the art of logic and of the nature of being" (Ibid.). The difference to which Maimonides wishes to draw our attention here is not merely a matter of education. It is also a difference between two kinds of problems raised by affirmative essential attributions. What is denied of God through the negations of ch. 55 is the *content*, or *subjectmatter*, of the predicate in question, e.g. the content of the predicate 'corporeal.' However, in the later chapters for which knowledge of logic is necessary, the problem to be solved by negative attributions is not (or not simply, insofar as metaphysics, "the science of being," also enters) a matter of the *content* of affirmative divine attributions but of their *syntax* or *structure* – remembering that for Maimonides logic is specifically concerned with the *syntax*, or *form*, of thought. In order to formulate this problem, which I shall now label "the syntactic problem of divine attributes," Maimonides proceeds in two steps.

The first step is to abstract out the syntax, or logical form, of divine affirmative attributions from their subjectmatter, to separate the logical form from the concrete utterance of external speech which consists of both (subject) matter and form. The indirect way in which Maimonides proceeds is by arguing that anyone who believes that there exist essential divine attributes must also hold, because there exists no respect in which God and creatures are comparable, that all predicates attributed to God are homonymous, or completely equivocal, with respect to their applications to creatures; "these attributions [to God and to creatures] have in common only the name and nothing else" (I:56:131). And because the only meanings *we* attach to such predicates are, of course, the meanings they have in application to creatures, it follows that their divine attributions are not only equivocal but also completely mysterious to us. All we can say, for example, of the meaning of the affirmative attribution that God possesses knowledge is that, whatever divine attribute the term 'knowledge' signifies, it is not knowledge as we know it. Thus, as Maimonides himself notes in a later summary of this argument, the equivocation thesis already "resorts to negations" (I:60:144). As with the earlier negations of Chapter 55, however, what is negated in this instance is still only the *content* of the predicate.

Yet, Maimonides' strategy here should be emphasized: negating the *content*

of the predicate is precisely what enables us to make the *form* of the sentence perspicuous. For inasmuch as the predicate, e.g. 'knowing,' occurs in the sentence 'God is knowing' fully equivocally, it is nothing more than a "placeholder" for the predicate – if we could ever know it – that *would* univocally express the "mysterious" attribute apparently attributed to God. To avoid confusing the two entirely distinct attributes equivocally signified by the equivocal predicate, it would be good, in fact, to follow contemporary practice and replace the actual word by a schematic predicate letter, e.g. 'God is F.' But, in any case, as we cancel its content and, in effect, schematize the sentence, we make explicit its form or syntax, which itself is then seen to raise a problem in its own right for the non-compositionality of the deity. In the next chapter, Maimonides then takes the further step of dealing – by negation – with this sentential *form*, the *syntax* of such essential affirmative attributions.

One of the predicates explicitly claimed in chapter 56 to be purely equivocal in application to God and creatures is the predicate 'exists.' It should strike the reader as somewhat surprising, then, that Maimonides begins chapter 57 by discussing that same predicate for a second time. In a much discussed passage, Maimonides claims that, with respect to all beings other than God, who are all caused, existence is an accident "superadded to the quiddity of what exists" (I:57:132). However, because God (uniquely) has no cause,

> His existence is necessary. Accordingly, His existence is identical with His essence and His true reality, and His essence is His existence. Thus His essence does not have an accident attaching to it when it exists, in which case its existence would be a notion that is superadded to it ... Consequently, He exists, but not through an existence other than His essence; and similarly He lives, but not through life; He is powerful, but not through power; He knows, but not through knowledge. For all these attributes refer back to one notion in which there is no idea of multiplicity ...

As commentators since Moses of Narbonne have pointed out, the distinction Maimonides draws here between the caused, or accidental, existence of all beings other than God and the uncaused, or necessary, existence of God is based on Avicenna's celebrated distinction between the existence of God which is necessary-in-itself and the existence of all beings which are contingent-in-themselves and necessary only through their causes.[82] It is also important to note, however, the important differences between Avicenna's thesis and Maimonides' presentation of it here. For one thing, in insisting that 'exists' is equivocal in its applications to God and everything else, Maimonides goes significantly further than Avicenna who "rejected the view that the term 'exist' has two different senses when applied to God and the world and firmly held to the univocality of 'existence'."[83] Second, unlike Avicenna's own argument for the necessary existence of the deity, a version of which Maimonides also presents in the *Guide* II:1 (the "third speculation," pp. 248–9) which is a pure metaphysical, specifically, a cosmological argument,[84] the argument presented here in I:57 is a *semantical* argument. That is, what Maimonides argues here is

that the predicate 'existence' (as we see in its applications to caused entities) stands for an accident which, like all accidents, is a quality and, hence, an attribute, superadded to the essence of that to which it is attributed. However, it has already been demonstrated that God possesses no qualities and, hence, attributes superadded to or, for that matter, distinct from His essence. Therefore, the predicate 'existence' applied to God cannot stand for an accident. *If* it none the less applies to God (in material terms: *if God exists*, a supposition Maimonides assumes here without argument), what it applies to Him, namely, His existence (keeping in mind, at the same time, the equivocality of the term), must therefore be, not an accident, but necessary, i.e. *not an attribute but a notion identical to His essence.* In other words, the sense in which the existence of God is necessary is not that He possesses the attribute of existence necessarily rather than accidentally, but rather that the predicate 'existence' does not designate an attribute distinct from the essence of the deity designated by the term in subject position.[85]

Why would one think that 'existence' applied to God is an attribute? Clearly, because of the surface subject/predicate *syntax* of the sentence 'God exists' in which the term standing for existence occupies attributive position. It is with the intention of undermining this syntactic ground for claiming that there exist divine attributes that Maimonides proposes the formula "He exists, but not through an existence other than His essence." That is, God's existence is not an attribute (accidental or, for that matter, essential) distinct and distinguishable from – for only then ascribable to – the essence of the entity designated by the subject term; it is identical with that essence. The subject/predicate syntax of the statement asserting God's existence, which creates the appearance that His existence is something other than His essence, should not misguide us to believe that it is an attribute.

This first attempt to solve the syntactic problem of divine attributes is still not, however, entirely satisfactory, a fact that Maimonides himself recognizes. Although the intention of Maimonides' solution is clear enough, and although Maimonides is able to *describe*, indirectly through his formula, the intended content of an attribute-free statement about God, he is still not able to *make* such an assertion without falling back into the snares of compositionality. For even the formula 'He exists, but not through an existence other than His essence' retains in its first main conjunct the basic subject/predicate structure that gives rise to belief in the existence of attributes distinct or distinguishable from the essence of the subject, whether the attribute is an accident or essential.

To improve on this first attempt, Maimonides therefore makes a second attempt in the next chapter. He proposes that every statement of external speech that contains an affirmative essential attribution to God be translated in internal speech as – i.e. be understood to mean – the negation of the corresponding privation. Thus, each of the five essential affirmative attributes of God already mentioned (namely, [necessarily] exists; living; powerful; knowing; willing) is taken to mean the negation of its corresponding privation ([possibly] absent; dead; powerless; ignorant; inattentive). Now, one, how is this strategy meant to solve the problem and, two, does it succeed?

To begin with, in the course of explaining the difference between affirmative and negative attributes in this chapter, I:58, Maimonides makes a subtle change in the way he formulates the problem posed by essential affirmative attributes. Initially, in chapters 51 and 52, the problem of compositionality posed by essential attributes was described as the problem that, if the deity were in any way composite – if His essence were itself composed out of distinct attributes – His existence would be dependent on an "anterior cause" who "composes" the attributes into one essence and, thereby, is "the cause of [God's] existence and by which, in consequence, He is defined" (I:52:115).[86] Here, in I:58, what is said to be problematic about affirmative essential attributions is that even if such an attribute does not "particularize" the deity, it "indicates a *part* of the thing the knowledge of which is sought, that *part* being either a part of its substance of one of its accidents" (I:58:135; my emphasis). Here the problem of affirmative attributes would seem to be not, or not primarily, its causal implications for the deity but the implication that God is a *complex* (whole), or perhaps a *body*, i.e. something that might be defined or divided into *parts*.[87] As Maimonides explains, one source of the belief in divine attributes is the belief (encouraged by Scripture) that God, like other existents, is a *body* with an essence "necessarily endowed with attributes." And even those who "raise themselves above" the explicit claim that God is a body, nonetheless "preserve the attributes" (I:51:114).[88]

Now, negative attributes are said to avoid this latter problem because they "do not give us knowledge in any respect whatever of the essence the knowledge of which is sought" (I:58:135); in particular, then, they do not give us knowledge of a *part* of the essence. For a privation, while an attribute, is not a *part* of the thing, or the essence of the thing, of which it is a privation; for example, even the *affirmative* privative statement 'God is dead' would not (falsely) ascribe death as a *part* to God. But, to take this yet one step further, Maimonides also tells us that the negations in question are meant as categorical negations: what they deny are the categorical, or generic, conditions required in order for the entity in question either to have or not to have the privative (or the corresponding affirmative) attribute in question. In Maimonides' own example, 'A wall does not see,' the negation denies of the entity referred to by the subject term "something that cannot *fittingly* exist in it" (I:58:136; my emphasis).[89] So, what is meant by saying that God is living which, translated into the form of a negation of the corresponding privation, asserts that God is not dead is: God is *not* of the category or genus of entity that is *either* dead or alive, which is to say that His being is not like the beings of the elements which are of the category or genus of things which are either dead or alive. Therefore, to make such a categorical denial of a privative attribution to God is to describe an *additional* privation, i.e. to assert the *absence*, or lack, of the relevant categorical pre-condition in God. Again, then, this form of statement enables us to make an assertion about God without indicating a *part* of Him. So, with the apparatus of negations of privations, we finally seem to have the linguistic means to make informative assertions about God without implying anything about any element, or part, of His essence.

Now, it should be clear that this account is a solution intended for a problem raised by the *syntax* of affirmative essential attributions. It does not turn on the content of any particular affirmative attribute, nor is it addressed to a general problem with the contents of all divine predicates like that raised by divine incomparability and for which the equivocation thesis is meant to be a solution. However, the theory of negative attributes does *create* a serious problem of content for Maimonides. For each such categorical negation of a privation now asserts of the deity who possesses all perfections and no imperfections that He possesses a privation, namely, the absence of the categorical condition in question. And this surely is an imperfection – notwithstanding Maimonides' explicit claims that all such negations simply exclude properties that cannot be attributed to Him. The next step in Maimonides' argument is, therefore, to counter, or to defuse, at least outwardly, this rather unpalatable consequence.

One response to this difficulty is suggested by Al-Farabi in an isolated passage on the deity that occurs in the context of a general discussion of indefinite nouns, i.e. nouns signifying privations:

> One should, therefore, not say that God Most High can be described negatively, but that He can be described by indefinite nouns. In many cases, their precise function is to signify a positive quality which is affirmed in such a way as to distinguish its subject totally from the things of which the corresponding definite noun is true, in which case they do not signify a privation. For it would be absurd to say that, in connextion with something which cannot be deprived at all, an indefinite noun signifies a privation.[90]

But Al-Farabi's solution is, of course, not available to Maimonides. For having denied all attributes of God, Maimonides cannot *now* introduce a new, though equivocal, affirmative predicate signifying an unknown positive quality which the deity alone possesses and which distinguishes Him from all those things which possess the categorical condition denied of Him. Maimonides' solution is therefore different. After having translated the original affirmative attributions (in external speech) into the form of categorical negations of privations (in internal speech), he moves immediately to give interpretations of *their* (the negated privations') meanings in positive terms, not, however, as divine attributes but as metaphysically innocent divine *actions*, i.e. natural processes.[91] For example, the statement in external speech that God is powerful is first translated into the statement of internal speech that He is not powerless, and this, in turn, is said to signify "that His existence suffices for the bringing into existence of things other than He" (I:58:136). But this move, at least in part, is to concede defeat. For it is tantamount to the admission that the only way to make true sense of statements apparently about God is as statements signifying some aspect or process of the natural world and *not* as statements truly about *God*. As a solution to the syntactic problem of divine attributes, it works only at the cost of changing the topic of assertions at face value about God to that of assertions about nature.

There is a further problem with this solution to the syntactic problem of divine attributes. Even were we to grant that Maimonides has successfully solved the problem of affirmative attributes as he sets up the problem in I:58 – as a problem of divine parts – the solution in terms of negations of privations still does not solve the *original* syntactic problem of attributes as it was described in I:51 and 52 and as he *again* describes it in I:59:

> Know that when you make an affirmation ascribing another thing to Him, you become more remote from Him in two respects: one of them is that everything you affirm is a perfection only with reference to us, and the other is that He does not possess a thing other than His essence, which ... is identical with His perfections. (I:59:139)

The first of these problems with affirmative attributes is the matter of their *content*. But the second is a function of their *syntax* and, in particular, the syntax of *attribution* – regardless of whether the attribute is affirmative or privative.[92] For the very subject/predicate grammar of the sentences expressing such attributions implies that there exists an attribute (signified by the predicate) distinct from the essence (of the thing signified by the subject term) which, in turn, should require some antecedent cause to compose the two. That is, even if a privation is not a *part* of an entity, it is no less of an attribute which, in turn, requires a subject, or essence, to which it is ascribed. But this structural differentiation of essence and attribute is itself a violation of divine unity or simplicity.

> For there is no oneness at all except in believing that there is one simple essence in which there is no complexity [*tarkīb*; lit: composition] or multiplication of notions, but one notion only; so that from whatever angle you regard it and from whatever point of view you consider it, you will find that it is one, not divided in any way and by any cause into two notions; and you will not find therein any multiplicity either in the thing as it is outside of the mind or as it is in the mind ... (I:51:113)

Here Maimonides' Arabic term for complexity, or composition, *tarkīb*, is the very same term that we have already noted is appropriated by Al-Farabi for logical syntax. This is no accident. Throughout his argument Maimonides assumes (perhaps without sufficient justification, especially in contemporary lights) that composition in the representation implies composition in what is represented or, more generally, that substantive metaphysical theses can be read off linguistic, or logical, structure.[93] Thus, in our case, the syntactic structure of the vehicle or medium of representation carries with it the implication that there exists a comparable structural division of essence and attribute and, hence, composition in the deity represented. The true oneness in the mental representation of the diety which Maimonides seeks is invariably breached by any representation that contains even the simplest internal syntactic *structure*, that of subject and predicate.[94]

Maimonides, moreover, goes out of his way to emphasize on three occasions in each of the three chapters on negative attributes that the description of God by means of negations of privations *is* description by means of attributes. Like affirmative attributes, "the *attributes* of negation ... bring about some particularization" (I:58:134; my emphasis) of that to which they are attributed. Furthermore, just as one "comes nearer to the apprehension of the true reality of" something "with every increase in attributes that are predicated of it," so "you come nearer to the apprehension of [God] with every increase in the negations regarding Him" (I:59:138). Finally, the lesson of Maimonides' "parable" of the ship is that the person who has produced the maximal number of negative descriptions "has nearly achieved, by means of these negative attributes, *the representation of the ship as it is* ... that is, *he has attained equality with one who has represented the ship by means of affirmative attributes*" (I:60:143–4; my emphasis). Taken together if not singly, these passages overwhelmingly indicate that Maimonides holds, and also wants his discerning reader to know, that negative attributes are *attributes*. Which, in any case, they should be. For privative predicates, whether affirmed or denied, signify *something*; not, admittedly, something existent but something non-existent in a subject in which it ought to exist. Yet, the fact that it is non-existent makes the signified thing, the privation, no less of an attribute.[95] Therefore, whatever problems specific to *affirmative* attributes they avoid, (negated) privative attributes are still subject to any problem common to divine attributes *simpliciter*. One such problem is the original syntactic problem raised by the subject/predicate syntax of statements about God, and for that problem Maimonides has not yet found a solution.

The general difficulty here, as we have already seen, is that even inner speech, or thought, can only be epistemically grasped by us humans through the medium of external speech. Hence, the expressive powers of the former are subject to the limitations of the latter and, most notably, to its subject/predicate syntax which carries with it the essence/attribute distinction. As a gloss on his first solution to the syntactic problem, Maimonides makes the following judgment, which applies equally well to his second solution:

> These subtle notions that very clearly elude the minds cannot be considered through the instrumentality of the customary words, which are the greatest among the causes leading unto error. For the bounds of expression in *all* languages are very narrow indeed, so that *we cannot represent this notion to ourselves except through a certain looseness of expression.* (I:57:132–3; my emphasis)

The representations to which Maimonides refers here are the mental representations of inner speech, those representations which have *already*, as much as possible, been subjected to the regimentation of logic and to philosophical clarification. *Even* those mental representations, and not simply the concrete utterances of external speech, obscure the "subtle notion" that the deity can be truly signified only in statements free of the essence/attribute

distinction. Anticipating his second solution, he says that to "indicate that the deity is not many," we only possess the words to say that He is one, "even though 'one' and 'many' are some of the subdivisions of quantity" (I:57:133); i.e. what we really want to say here is that God does not fall under the genus of quantity at all. More generally, in each case of negation of a privative attribute, it is the categorical or generic precondition – the most general of which is that of having an essence, the kind of thing in which attributes can subsist – which we truly wish to deny of God. But we have no linguistic means of expression for *generally* denying such a condition except one with subject/predicate structure, the structure which presupposes the very condition we wish to do away with. Even, for example, the pure "oneness" which Maimonides seeks for representation of the deity, the oneness in which "there is one simple essence in which there is no complexity or multiplicity of notions" (I:51:113), cannot be achieved given the human mental repertoire for representing essences. For all our mental representations of essences are "of necessity endowed with attributes, for we never find an essence of a body that while existing is divested of everything and is without an attribute" (I:51:114).[96] Nor can we ever entirely free our conception of essence from its relation to the body; because, in Maimonides' own vocabulary, we are "forced" into this position by our human "wish to preserve the conception of the imagination."[97] That is, we are trapped by language in a certain picture. The most we can do is "give the gist of the notion and give the mind the correct direction toward the true reality of the matter ..." (I:57:133). Even the negative attributes only "*conduct* the mind toward the utmost reach that man may attain in the apprehension of Him" (I:58:135); but such "conduct," or "guidance" [for which Maimonides uses one Arabic term *irshād*], only "leads to a knowledge of the existence of a thing" – usually through less then demonstrative proofs – as opposed to "an investigation of the true reality of the essence and substance of that thing" (I:46:97). In sum, then, negative attributes can turn us in the right direction and, for that reason, are to be preferred to affirmative ones. But as an answer to the normative question of attributes, the question whether they enable us to express *truths* about the deity, even negative attributes fail.[98]

The theory of negative attributes is not, however, Maimonides' last word on the subject. He makes three further attempts at statements about or descriptions of God – two of which he attempts to read into Scripture – which break out of the problematic structure of subject/predicate syntax and thereby divine compositionality. I will conclude by briefly surveying these three cases. The first – which makes the syntactic problem it is meant to overcome as explicit as can be – is the divine name *I am that I am* (Exod. 3:14) which is said to be "a true notion of the existence of God" whose

> secret consists in the repetition in a predicative position of the very word indicative of existence. For the word *that* [in the phrase '*I am that I am*'] requires the mention of an attribute immediately connected with it. For it is a deficient word requiring a connection with something else ... Accordingly the first word is *I am* considered as a term to which a predicate is attached;

> the second word that is predicated of the first is also *I am*, that is, identical with the first. Accordingly Scripture makes ... a clear statement that the subject is identical with the predicate. This makes it clear that He is existent not through existence. This notion may be summarized and interpreted in the following way: the existent that is the existent, or the necessarily existent. (I:63:155)

As Maimonides' allusions to I:57 in the last two sentences make clear, he wishes to argue that the motivation of Scripture (!) in introducing the grammatically odd phrase '*I am that I am*' ['*Eheyeh 'asher 'Eheyeh*] was nothing less than a desire to avoid the syntactic problem of divine attributes, i.e. to arrive at some linguistic means to express the existence of God without implying that 'existence' is a predicate signifying an (accidental) attribute distinct from the essence of the subject of the sentential phrase. The way in which he thinks Scripture attempts to accomplish this is by undermining the normal subject/predicate syntax of external speech. More specifically, by repeating the inflected verb for existence, '*Eheyeh*,' in both subject and predicate positions, Scripture tells us that the two syntactic categories are identical, meaning that there is no *syntactic* distinction between subject and predicate to be drawn in this phrase and, therefore, that its metaphysical presupposition distinguishing essence and existence should likewise not be made. Thus God can be said to exist but not to possess an attribute of existence.

Maimonides' second attempt to avoid the syntactic problem is his explication of the logical form of the Tetragrammaton, the so-called *articulated name* of God. This name, unlike all other names of God, he says, "originated without any derivation" (I:61:147).

Now, what Maimonides means by 'derivation' here is two-fold. First, it means that the other names are semantically derived from terms signifying human actions. Applied to God, they then signify Him by way of His divine actions, i.e. indirectly though the governance of nature. Second, and in a syntactic or logical (i.e. not a lexical or etymological) sense – and one specifically due to Al-Farabi – it means that the name indicates an attribute "*because of its being derived*" (I:61:148; my emphasis).[99] Here Maimonides, following Al-Farabi, holds that the very *forms* of these other names, inasmuch as they are derived from action-words, indicate attributive notions. And because an attribute requires something of which it is an attribute, the derivative word also indicates an (unstated) essence, "not an essence alone, but an essence possessing attributes" (Ibid.). Hence, all such names unavoidably "produce in one's fantasy the conception of multiplicity; ... that the attributes exist, and that there is an essence and a notion superadded to this essence" (Ibid.).

To spell this out in contemporary logical terms, consider the derivative "name" for God, 'The Faithful.' According to Maimonides, this "name" is really of the logical form of the definite description: 'The (unique thing) x such that x is faithful,' which is itself "derived," or *constructed*, from the predicate (or open sentence) 'x is faithful.' But because a predicate is incomplete in itself –

i.e. it is not itself semantically valued – it requires, and thereby implies, or (in Maimonides' words) "indicates," a singular term (or its value, occupying the position marked by the place-holder '*x*') in order to "complete" it as a statement. It is exactly with this in mind that Maimonides writes that "the indications of all derivative terms are such that they indicate [*both*] a notion *and* a substratum that is *not clearly stated* and with which the notion in question is connected" (I:61:148; translator's interpolation; my emphasis). The only, rather technical, difference between our description of this structure nowadays and Maimonides' is that we would describe the predicate '*x* is faithful' as standing for a function which requires an argument to complete it, while Maimonides describes it as standing for an attribute that requires a substratum (or essence) signified by an elliptical singular term.

The Tetragrammaton, on the other hand, is underived in both these senses. First, it is semantically primitive. Its meaning is a notion which is not at all borrowed from prior applications to creatures; instead it "gives a clear unequivocal indication of His essence," which Maimonides proposes, with some hesitation, is "the notion of a necessary existence" (I:61:148) – once again, in the equivocal and mysterious sense of I:57 in which existence is not an attribute. Second, in the syntactic sense, it is underived in that its form indicates no attribute and, hence, no essence or substratum in which the attribute subsists. Only such a syntactically underived name, then, circumvents the undesirable metaphysical implications of divine multiplicity and composition which Maimonides is struggling to avoid.

Maimonides' third attempt to circumvent the syntactic problem of divine attributes concerns, again, statements that assert the being of God while avoiding the problematic syntax of statements of the form 'God exists.' In three different places scattered through his exposition of negative attributes in I:58, Maimonides says of God, first, that "we are only able to apprehend *the fact that He is* [*'anniyya*] and cannot apprehend His quiddity [*māhiyya*]" (I:58:135); second, that God has no "'That' [*'anniyya*] outside of His 'What' [*māhiyya*]" (ibid.); and at the end of the chapter: "What should be the state of our intellects when they aspire to apprehend Him who is without matter and is simple to the utmost degree of simplicity ... – we who only apprehend *the fact that He is* [*'anniyya*]?" (I:58:137) The Arabic term *'anniyya* that recurs throughout these passages is unusual and obscure; various scholars have indeed proposed significantly different philological histories and translations for it. Pines has argued that it originated as a transliteration of the Greek *einai* or *on*, in which case God's *'anniyya* should be translated as His being.[100] Munk and Baladi derive the term from the Arabic *'an* or *'anna* (lit: 'that'), in which case God's *'anniyya* is His *quoditas*, *that* (as opposed to *what*) He is.[101] D'Alverny and Kafih derive it from the Arabic term *'anā*, for 'I,' the Ego, or Self. Thus God's *'anniyya* would be His I-ness or Ego.[102] And, finally, Vajda, following Al-Farabi, takes the word to originate from the Arabic *'inna*, meaning the interjection 'indeed'; accordingly, the term should be understood to mean that, while God cannot be described, we can emphatically affirm Him to be.[103] Now, it is interesting, and even remarkable, that each of these explications, despite

their differences, can be made to fit Maimonides' text.[104] But what is even more important for us is that, according to *all* these explications, *'anniyya* signifies, or affirms, the being of God without utilizing an existence predicate and without signifying an attribute for His existence as distinct from His essence. That is, the word *'anniyya* has itself the syntactic form neither of a predicate nor of a subject. So, by making use of this expression Maimonides can truly say that the divine being thus apprehended is not something to whom a "notion attaches that is superadded to His essence" (Ibid.), a being who has a "'That' outside of His 'What'" (I:58:135), or a being whose "What" is in any way composite, i.e. structured. We can say nothing at all, in fact, about the nature of God's existence, only "the fact that He is."

With these last three expressions, Maimonides seems, finally, to have found a way of affirming God's being or designating Him without running afoul of the syntactic problem of attributes. Yet his discovery brings with it little satisfaction, for this is *all* we can truthfully say of God. In particular, we are left with no adequate means of expressing any truth concerning His relation to the world (apart from action statements, which are properly about nature); indeed we can say nothing at all *about* God. Thus, in the very same passage in I:58 quoted above, Maimonides tries to move beyond the statement "that He is" to say something about His relation to the world using the well-known analogy of "a captain of his ship." Yet he must immediately concede that "even this is not the true relation and a correct likeness, for this likeness has been used [only] in order to lead [*irshād*] the mind toward the view that He ... governs the existent things" (I:59:137) – 'lead,' again in that same weak sense noted earlier, of conduct or guidance that brings us to posit knowledge of something's existence as opposed to the true reality of its essence or substance.

Furthermore, there is a second problem for our mental representation of the deity which arises from the same epistemic limitations as the syntactic problem already discussed but which turns on Maimonides' theory of signification. According to that theory, as we have seen, a speaker must possess a uniquely or sufficiently differentiating mental representation of an object in order to designate it with a name. But *can* we possess mental representations, specifically intelligibilia, which truly signify the deity or, for that matter, any object of divine science (or even super-lunar celestial phenomena, as hinted in I:58:136–7)? The general difficulty here is this: Because the mental representations in question are intelligibilia dependent for their existence on the faculties of the mind, they are subject to its limitations and, in particular, to those of the human intellect. Therefore, if there are limitations on human intellection of non-material entities – in particular, if Maimonides held, as it has recently been argued, that man can cognize only forms which originate either directly by abstraction from sensory perception or indirectly by demonstration from such forms – then the intelligibilia of which he can have any apprehension, and from which his mental representations are composed, may well not include (either simple or complex) representations of the deity, separate intellects, and possibly even celestial astronomy.[105] I will not attempt to argue here for this general thesis. I will only emphasize the point that *if* there do exist these

limitations on human knowledge, then these same limitations should carry over to the mental representations through which we purport to designate the deity and other entities of divine science. In consequence, not only will it turn out to be impossible for us to achieve ultimate intellectual perfection through *knowledge* of God; it will even be impossible for us to *designate* Him.

Consider, once again, the Tetragrammaton, the one and only one *name* of God, which is said to "give a clear unequivocal indication of [God's] essence" (I:61:147), which Maimonides, with a slight qualification, further proposes is "the notion of a necessary existence" (I:61:148). What mental representation could we possibly have of this notion of a necessarily existent being in virtue of which the name designates the deity? As we saw in our discussion of I:57, Maimonides' use of this notion is based on Avicenna's idea of a being whose existence is necessary-in-itself. However, Maimonides goes further than Avicenna both in making the term 'exists,' or 'necessarily exists,' when applied to God, entirely equivocal – which is to say also mysterious – and in denying that the existence of this necessarily existent being is an *attribute*. This view is now reinforced by Maimonides' conception of the Tetragrammaton as an underived name (in both senses of 'underived'), i.e. a name that (1) indicates no attribute requiring an essence or substratum and (2) "is indicative of a notion with reference to which there is no association between God ... and what is other than He" (I:61:148). But if this is the relevant notion signified by the words 'necessary existent' in application to the deity, it should be clear that we could not possibly have come to cognize it by having directly abstracted it from anything in our sensory experience. Nor does the theory of negative attributes make it any more knowable. For even if God (necessarily) exists means that His non-existence, or absence, is impossible, the privation-terms in question can be attributes no more than their corresponding affirmatives and they must be equally equivocal.

One might still, of course, argue that we come to cognize the relevant notion of a necessary existent indirectly – by some kind of demonstration from other simple forms which we have directly abstracted from sensory perception; indeed it might be claimed that Maimonides provides such a demonstration in his third speculation in II:1:247–249. But that purported demonstration cannot be squared with Maimonides' claims in I:57 and I:61; for the demonstration of II:1 assumes the univocality of 'exists' in its application to God and creatures, the very claim denied in the former chapters. Furthermore, in other remarks scattered through the *Guide*, Maimonides gives repeated hints that he himself does not believe that this or the other demonstrations in II:1 are sound. Thus he tells us, first, that the Necessary Existent is not identical with the intellect that moves the highest sphere (II:4:259–9), whom he in turn also identifies with the deity (I:70:172; I:9:34f; II:18:302). Yet it is specifically by way of the first mover that he goes on to say that we possess "the greatest proof through which one can know the existence of the deity – I mean the revolution of the heaven" (I:71:175), possibly implying that the demonstrations of II:1 are not what they appear to be. In sum, without any clear indication by Maimonides of the content of a representation of the Necessary Existent, the

very existence of these various statements should at least make us wonder whether he himself really believed that it is through such a notion like that of necessary existence that we are able to designate God.[106]

Both for this reason that turns on his theory of signification and for the earlier reason that derives from the syntactic problem of divine attributes, it is hardly surprising that Maimonides concludes Chapter I:59 with yet another praise of silence before God. But, unlike his earlier praise of silence in I:50, the kind of silence he now advocates is not one in which we restrain ourselves to represent God with the logically precise expressions of internal speech rather than with the vulgar utterances of external speech. Rather this is a silence of "weariness and incapacity" (I:59:137), the expression of failure to arrive at adequate expressions to represent the deity *even* with the superior resources of inner speech.

These problems – one a function of his conception of the syntax of thought, the other of his theory of signification – are two instances of perplexity *toward* which the *Guide* leads its philosophical reader. Because they are left essentially unresolved, Maimonides may well have wished not to divulge them to every reader. Hence, he adopts a deliberately unsystematic and indirect mode of presentation for his account of language and also includs the subject of language as a *sod*, or mystery, in his esoteric exposition of *ma'aseh bereshit* in II:30 – to return at last to the third of our original three questions.

Both of the perplexities at which we have arrived are, it should be said in conclusion, direct consequences of Maimonides' view that language is not divine and not supernatural, that it is instead the product of human invention and that its syntax and manner of signification are a function of the limited capacities of human mental representation and intellection. Because of these limitations, we might add, language "is a strong veil preventing the apprehension of that which is separate from matter as it truly is" (III:9:436). Contrary, then, to almost all previous scholarly discussions of his theory of divine attributes which have centered around the question whether Maimonides held that only negative knowledge of God or also certain positive knowledge is possible, both of these alternatives are in fact ruled out according to the interpretation of Maimonides' argument proposed in this paper. Not only is there no positive substantive knowledge of God. Because statements ascribing negative attributes to God also *falsely* presuppose the essence/attribute distinction, they also express no (negative) *knowledge* of the deity. Maimonides is not, then, an advocate of negative theology. The lesson he intends for us to draw from the theory of negative attributes in particular and his science of language in general is the negation of the possibility of theology.

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NOTES

*For comments on earlier drafts of this paper, I wish to thank Moshe Halbertal, Warren Zev Harvey, Joel Kraemer, Yoram Navon, A.I. Sabra, Bernard Septimus, Sarah Stroumsa, Raymond Weiss, and especially Jonathan Malino. A slightly earlier version of the major parts of Parts III and VI appears in my "Logical Syntax as a Key to a Secret of the *Guide of the Perplexed*" (in Heb.), *Iyyun* 38 (April 1989): 137–166.

[1] This assumption would have been standard given the medieval philosophical curriculum in which logic, as the tool of philosophy, was studied before philosophy proper. Note also that the study of logic meant the study of a closed set of fixed texts: the various works of Aristotle and their Hellenistic and Arabic commentaries.

[2] *Guide*, Dedication, 3; all references to the *Guide of the Perplexed* are to the S. Pines translation (Chicago, University of Chicago Press, 1963). In-text parenthetic references are to Part, Chapter, and Page.

[3] See A. Marx, *Jewish Quarterly Review* (N.S. XXV): 378–80; translated in Pines' Introduction to his translation of the *Guide*, ix.

[4] BT Rosh Hashanah 32a; BT Sanhedrin 19a.

[5] See Gershom Scholem, "The Meaning of the Torah in Jewish Mysticism," in his *On the Kabbalah and Its Symbolism* (New York, Schocken, 1965) and his "The Name of God and the Linguistic Theory of the Kabbalah," *Diogenes*, no. 79–80 (1972), 57–80, 164–94.

[6] Harry Austryn Wolfson, "The Veracity of Scripture from Philo to Spinoza," reprinted in his *Religious Philosophy: A Group of Essays* (Cambridge, Harvard University Press, 1961), pp. 217–245.

[7] Judah Halevi, *Kuzari* I:55; for further discussion of this objection, see below, Part IV.

[8] Ibid. IV:25; cf. also Nahmanides, *Commentary on the Torah*, c. on Gen. ii:19.

[9] On Halevi and earlier rabbinic divine language theories, see now Bernard Septimus, *Maimonides on Language*, forthcoming, especially Part III and references therein; and Josef Stern, "Language," in Arthur A. Cohen and Paul Mendes-Flohr, eds., *Contemporary Jewish Religious Thought* (New York, Scribner's, 1987), 543–551.

[10] On doctrines of the pre- or uncreated Word in medieval Judaism, see Harry Austryn Wolfson, *Repercussions of the Kalam in Jewish Philosophy* (Cambridge, Harvard University Press, 1979), p. 111f.

[11] In I:66, among other passages, Maimonides goes still further, identifying the divine and the natural (as opposed to the artifactual). Thus to say that the Torah is "created," "the work of God," "the writing of God," or "the word of God" (I:66:160) is to say that "its existence is *natural* and not *artificial*" (I:66:160). Compare also *Guide* III:32:525 and, for the sense in which the Law is divine, namely, natural, II:39, II:40 and III:27; see especially II:40:382 on the relation between the natural and the conventional in Law. See also below, Part IV, on the parallel between law and language in Al-Farabi. Note that Maimonides uses terms of language and speech, e.g. 'speaking' or 'saying,' to express the social and political perfection of the Law because he takes the primary function of (external) language and speech to be socio-political; see e.g. his remark that "speech may only be addressed to an existent that receives the command in question" (I:65:159).

[12] Note Maimonides' shift from the name of the scriptural book, *Bereshit/Genesis*, to the rabbinic term, *ma'aseh bereshit*, which he interprets as (Aristotelian) natural science.

[13] In the same vein, Maimonides explains that, wherever Scripture states in Genesis that "*God named something thus*, this [is] in order to differentiate between the particular notion envisaged and the notion equally signified by the term" (II:30:351). I.e. the literary device of divine naming refers to natural processes of differentiation. On this passage, compare Shalom Rosenberg, "The Interpretation of the Torah in the *Guide*," (Heb.) *Jerusalem Studies in Jewish Thought* 1/1 (1981):85–157, pp. 131–2.

[14] Maimonides, *Treatise on the Art of Logic*, ch. XIV, edited and introduced by Israel Efros, "Maimonides' Arabic Treatise on Logic," *Proceedings of the American Academy of Jewish Research* 34 (1966); Israel Efros, trans., "Maimonides' Treatise on Logic," *Proceedings of the American Academy of Jewish Research* (1938):1–65. (Except where noted I have relied on Efros' English translation which, it should be noted, was made before the full Arabic and Judaeo-Arabic text was available.) The passage cited in the text appears almost verbatim in "Al-Farabi's Introductory *Risālah* on Logic," ed. and trans. by D.M. Dunlop, *The Islamic Quarterly*, III:4 (January 1957): 224–235.

[15] See his discussion of the Platonic, Epicurean, and Aristotelian uses of these terms in "The Veracity of Scripture."

[16] Apart from these three questions, Maimonides discusses other questions which bear on divine predication concerning the *manner* of an expression's signification – whether it signifies univocally,

equivocally, amphibolously, metaphorically, etc. – in both the *Logic* and Part I of the *Guide*. Apart from the theory of negative attributes, I shall not discuss these topics in this paper. For discussions, see, e.g. H.A. Wolfson, "The Aristotelian Predicables and Maimonides' Division of Attributes," in his *Studies in the History of Philosophy and Religion*, ed. I. Twersky and G.H. Williams (Cambridge, Mass., Harvard University Press, 1977), pp. 161–195; Shalom Rosenberg, "Signification of Names in Medieval Jewish Logic" (Heb.), *Iyyun* 27, 1976–7: 105–144; and now Arthur Hyman, "Maimonides on Religious Language," in Norbert M. Samuelson, ed., *Studies in Jewish Philosophy* (Lanhem, MD, University Press of America, 1987). For a valuable overview of all these issues, see Shalom Rosenberg's seminal dissertation, *Logic and Ontology in Jewish Philosophy in the Fourteenth Century* (unpublished Hebrew University Ph.D. thesis, 1973), especially pp. 121–130 and 164–197.

[17] As will become clear in our subsequent discussion, the medieval use of the term 'logic' included considerably more than what we would nowadays classify under it, and more too than the Aristotelian science of the syllogism. "Theory of meaning" comes closer to capturing its true scope, though 'meaning' should include the content of thought more generally rather than *linguistic* meaning in a narrow sense only.

[18] I owe the quoted phrase to A.I. Sabra, "Avicenna on the Subject Matter of Logic," *Journal of Philosophy* (Nov. 1980): 746–764; p. 747.

[19] See Al-Farabi, *Enumeration of the Sciences*; presumably Maimonides follows Al-Farabi on this, although he nowhere puts it in writing. Compare his negative comment in *Guide* I:67:162 about the knowledge of his contemporaries of "the science of our language," i.e. the grammar of (biblical) Hebrew, and his criticism of the grammarian Menahem b. Saruk in his *Commentary on the Mishnah, Terumah* 1:1 (ed. and trans., Joseph Kafih, Jerusalem, Mossad Harav Kook, 1968), vol. 1, p. 167.

[20] For further discussion, see Sabra, ibid.; Muhsin Mahdi, "Science, Philosophy, and Religion in Alfarabi's *Enumeration of the Sciences*," in J.E. Murdoch and E.D. Sylla, eds, *The Cultural Context of Medieval Learning* (Dordrecht-Holland, Reidel, 1975), 113–147, especially 118–124; F.W. Zimmermann (trans., with Introduction and Notes), *Al-Farabi's Commentary and Short Treatise on Aristotle's De Interpretatione* (London, Oxford University Press, 1981), p. cxviii ff.

[21] On the controversy between the grammarians and logicians, see D.S. Margoliouth, "The Discussion between Abu Bishr Matta and Abu Sa'id al-Sirafi on the Merits of Logic and Grammar," *The Journal of the Royal Asiatic Society*, 1905, pp. 79–129; Muhsin Mahdi, "Language and Logic in Classical Islam," in G.E. von Grunebaum, ed., *Logic in Classical Islamic Culture* (Weisbaden, 1970): 51–83; Zimmermann, p. cxxiiff; Joel Kraemer, *Humanism in the Renaissance of Islam: The Cultural Revival during the Buyid Age* (Leiden, Brill, 1986), pp. 104–116; idem., *Philosophy in the Renaissance of Islam: Abu Sulayman al-Sijistani and his Circle* (Leiden, Brill, 1986), pp. 14–165; and Kwame Gyekye, "Al-Farabi on the Logic of the Arguments of the Muslim Philosophical Theologians," *Journal of the History of Philosophy*, XXVII, 1 (January 1989): 135–143.

[22] See also the beginning of *Logic*, Ch. XIII for further differences between grammar and logic.

[23] For this approach to interpreting Maimonides, I am very much indebted to Zimmermann's interpretation of Al-Farabi; cf. his Introduction, pp. xxxviii–xlviii.

[24] Cf. Dunlop, "Al-Farabi's Introductory *Risālah* on Logic," for the original on which Maimonides' virtually verbatim paraphrase is based.

[25] Cf. Maimonides' *Shemonah Peraqim*, Ch. II.

[26] Al-Farabi, *Iḥsā' al-'ulūm* [*Enumeration of the Sciences*], 'Uthmān Amīn, ed. (Cairo: Maktabat al-Khanji, 1931), pp. 17/18; cited in Sabra, p. 762.

[27] On the notion of a rule, see Mahdi, "Science, Philosophy, and Religion in Alfarabi's *Enumeration of the Sciences*," p. 120.

[28] Cf. Dunlop, "Introductory *Risalah*," p. 232f.

[29] Cf. Zimmermann, pp. xliiif and xlvi–xlviii.

[30] Cf. *Iḥsā'n al-'ulūm* 54.2, p. 23; cited in Dunlop, "Introductory *Risālah*," p. 226, n. 3. and in Zimmermann, p. xliii.

[31] See Zimmermann, pp. xxiv–xlviii.

[32] Cf. Zimmermann, xliii; Sabra, 748. It should be emphasized that Al-Farabi himself never describes his conception of logic in these terms, i.e. as a universal or mental grammar.

[33] On Maimonides' use of the phrase "rules common to all languages," see also his reference in his *Commentary on the Mishnah, Terumah* 1:1 to "the perfect scholars who discourse concerning general matters common to all languages" (vol. 1, p. 167), a reference presumably to Al-Farabi.

[34] Cf. Solomon Munk's comment in his French translation *Le Guide des Égarés* (Paris, 1856), 3 vol., vol. 1, p. 237, n. 1.

[35] Cf. I:31:67; I:53:119.

[36] III:8:432; the choice of name 'Adamites' for humans in this context alludes to the dictum, "The Torah speaks in the language of the sons of man [*benei adam*]," which is repeatedly used by Maimonides to describe the limitations of scriptural language. On Maimonides' use of this dictum, see my "Language" and further below.

[37] Elsewhere, i.e. where there is independent evidence that Maimonides held a restricted view of human knowledge, such qualifying claims might indeed be read in that limiting sense. Cf. e.g., *Guide* III:51, 53.

[38] See Shlomo Pines, "The Limits of Human Knowledge according to Al-Farabi, Ibn Bajja and Maimonides," in I. Twersky, ed., *Studies in Medieval Jewish History and Literature*, vol. 1 (Cambridge: Harvard University Press, 1979); "Lés Limites de la Métaphysique selon Al-Farabi, ibn Bajja et Maimonides; Source et Antitheses de ces Doctrines chez Alexandre d'Aphrodise et Chez Themistius," *Micellanea Mediaevalia*, 13:1 (1981): 211–25; and "The Philosophical Purport of Maimonides' Halachic Works and the Purport of the *Guide of the Perplexed*," in S. Pines and Y. Yovel, eds., *Maimonides and Philosophy* (Dordrecht-Boston, 1986). For an impressive though not entirely successful response to Pines' thesis, see now Alexander Altmann's "Maimonides on the Intellect and the Scope of Metaphysics," in his *Von der mittelalterlichen zur modernen Aufklarung: Studien sur jüdischen Geistesgeschichte* (Tübingen, West Germany, J.C.B. Mohr (Paul Siebeck), 1987, pp. 60–129, especially pp. 72–76 for an excellent discussion of Maimonides' theory of intellection against its Islamic background; also Arthur Hyman, "Demonstrative, Dialectical, and Sophistic Arguments in the Philosophy of Moses Maimonides," in Eric Ormsby, ed., *Moses Maimonides and His Time* (Washington, D.C., Catholic University of America Press, 1988); Barry S. Kogan, "'What Can We Know and When Can We Know It?' Maimonides on the Active Intelligence and Human Cognition," ibid.; Joel L. Kraemer, "Maimonides on Aristotle and Scientific Method," ibid., and my "Skeptical Themes in the *Guide of the Perplexed*," ms. The intellectual limitations in question, it should be added, bear only on our knowledge and representation of metaphysical truths; there may, however, exist additional limitations with respect to non-metaphysical human knowledge which do not have the same representational consequences. For examples of these other general incapacities of the intellect, which also arise for subjects other than metaphysics, see *Guide* III:49:605, III:23, and *Commentary on the Mishnah Eiruvin* 1, v.

[39] See Sabra, pp. 746ff., who argues that Avicenna also held this Platonic view. Note, however, that, while the conception of science is Platonic, the reason for lack of subjectmatter is Aristotelian.

[40] Cf. Zimmermann, pp. xxxix; and *C.* on *De. Int.*, 84.9–15 (p. 78), where Al-Farabi criticizes earlier commentators for "making logic an investigation into the nature and mode of being or existence of existing things [i.e. what is signified by expressions]." Although this view of logic was widely held among the Aristotelians, it was not universally accepted. Avicenna, it has been argued, claimed that logic has its own conceptual subjectmatter, the so-called "secondary intelligible concepts"; on this, see Sabra, pp. 751–757.

[41] To be sure, there was precedent for including these topics in a logic, after Porphyry and the canonization of the *Isagoge* and *Categories* within the *Organon*. For further discussion, see now Raymond L. Weiss, "On the Scope of Maimonides' *Logic*, Or, What Joseph Knew," in R. Link-Salinger et al., eds., *A Straight Path: Studies in Medieval Philosophy and Culture: Essays in Honor of Arthur Hyman* (Washington D.C., Catholic University Press, 1988), 255–265; p. 256. My thanks to Professor Weiss for kindly providing me with a prepublication copy of his paper.

[42] See *Guide* III:18:474, where he interjects, "as you know," alluding to the *Logic*. Cf. also ad. loc. Munk's comment in his translation, vol. 3, p. 137, n. 1, and vol. 1, p. 185, n. 2. In Vivas'es medieval Hebrew translation of the *Logic*, ch. X begins "When we see with our mind the universal," which, as Efros notes, may "reflect an anti-realistic view of universals" (p. 51, n. 20). Of course, anti-realism about universals was the standard Peripatetic position, hardly unique to Maimonides.

[43] See also *Logic*, Ch. XI, where Maimonides writes that he has digressed to discuss the distinctions between the potential and the actual, the essential and the accidental, the conventional and the natural, and the universal and particular because "the philosophers say that anyone who cannot [draw these distinctions] is unfit to reason," i.e. engage in rational discourse or scientific inquiry. For a different interpretation of this passage, see Weiss, "On the Scope of Maimonides' *Logic*," p. 257f.

[44] *Cratylus* 436b. For conflicting views of the – at best small amount of – direct knowledge Al-Farabi might have had of Platonic texts, see Franz Rosenthal, "On the Knowledge of Plato's Philosophy in the Islamic World," *Islamic Culture* 14 (194), pp. 387–422; and Zimmermann, lxxx, n. 3; p. 42, n. 1. The brief summary of the *Cratylus* in the "Philosophy of Plato," iii;7.0–7.10, is hardly evidence of direct familiarity with the dialogue; cf. Muhsin Mahdi, trans. and ed., *Alfarabi's Philosophy of Plato and Aristotle* (Glencoe, Ill., Free Press, 1962), p. 56.

[45] Cf. *De Int.* 16^a 5–8.

[46] This Arabic term is also sometimes used equivocally to signify the extra-mental *referent* – an individual or state of affairs – and the relation of *reference*. More often, however, Al-Farabi uses it in place of the original *ma'qūl* where the latter would be the direct translation of the Greek. Cf. Zimmermann, p. 11, n. 2, and xlii, n. 1. I am indebted to Zimmermann (personal correspondence) for clarification of this point.

[47] Zimmermann (personal communication) points out, however, that the "thought-component" signified by words can be of different kinds: sense data [*mahsūsāt*], images [*mutakhayyilāt*], and concepts [*ma'qūlāt*]; all of these should, obviously, be distinguished from the objects sensed, imaged, and conceived. Al-Farabi himself explains that Aristotle uses the phrase "'traces in the soul' rather than 'thoughts' because he means to cover all that arises in the soul after the sense-objects have withdrawn from the senses," including, in addition to thoughts proper, "images of sense-objects" that were actually perceived and (composite) images that the imagination "invents by combining images" (*C.* 24.17–21). It is not clear to me whether Al-Farabi means to include all of these mental entities under his own subsequent use of the term 'thoughts' [*ma'qūlāt*] or whether he uses this term in a narrow sense.

[48] The significance of this point will emerge in the final section of the paper.

[49] In an important paper which came to my attention only as I was completing this paper, Norman Kretzmann points out that Aristotle in fact uses two different Greek terms to describe two apparently different relations between spoken sounds and the mental trace or impression: 'symbol' (δύμβόλα) and 'sign' (δήμεῖα). Subsequent translators and commentators beginning in the Middle Ages, however, translated or interpreted both terms in one way and, in Kretzmann's opinion, thereby obscured the true meaning of the text. Among these was Ishaq ibn Hunayn, whose translation Al-Farabi used. This matter requires more discussion but reasons of space prohibit it here. Cf. Norman Kretzmann, "Aristotle on Spoken Sound Significant by Convention," in J. Corcoran, ed., *Ancient Logic and its Modern Interpretations* (Dordrecht-Holland, Reidel, 1974), pp. 3–21.

[50] For Al-Farabi the distinction between signification in the first and second place is not limited to speech; thus written inscriptions signify in the first place the corresponding speech or vocal utterance and in the second place the thought expressed. It is not obvious, then, that Al-Farabi meant to account specifically for semantic signification by means of this distinction. There is also no textual evidence that he would have generalized the idea to include signification in the third place, etc.

[51] It is not clear whether Al-Farabi thought that the universality of the thought/referent correlation and non-universality of the speech/thought correlation was simply *evidence* for the naturalness of the one and conventionality of the other, or that there is a stronger conceptual relation between the two sets of notions.

[52] Ed., Muhsin Mahdi (Beirut, 1970). My exposition of the *Book of Letters* is based on an unpublished preliminary translation of Part II by Prof. Mahdi. I wish to thank Prof. Mahdi for permission to consult his translation. All responsibility for the interpretation and exposition that follows is mine.

[53] Cf. *C* on *De Int.* 27.15–20.

[54] In the *Book of Letters*, Part II, Section XXI, par. 122, Al-Farabi also proposes that the more moderate the natural make-up, or physiology, of a people, the greater their acumen and knowledge, and the more their words will imitate or resemble their associated meanings and the extra-mental existents which they designate. This, he emphasizes, is by virtue of their natural make-up and not by design. That is, at least for certain aspects of signification, Al-Farabi seems to believe that there are naturalistic causal explanations that are independent of, or in addition to the role of, human legislative decisions. This Al-Farabian idea is, in turn, adopted by Maimonides, in his work of medical aphorisms, *Pirkei Moshe*, in response to Galen's claims for the superiority of the Greek language over all others. Using Al-Farabi's idea to justify a rather liberal re-reading of Galen, Maimonides claims that Galen meant to defend the superiority not only of Greek, but of all languages spoken by people in temperate climates, including Hebrew and Arabic (!). See *Pirkei Moshe Birefuah*, ed., Sussmann Muntner (Jerusalem, Mossad Harav Kook, 1959), Treatise XXV, par. 56–58; English translation: *The Medical Aphorisms of Moses Maimonides*, 2 vols., trans. and eds., Fred Rosner and Sussman Muntner (New York, Yeshiva University Press, 1970), vol. II, pp. 201–3. For further discussion, see also Septimus, "Maimonides on Language," pp. 79–87; Shalom Rosenberg and Charles H. Manekin, "Philosophical Observations on Maimonides' Critique of Galen," *Koroth*, vol. 9, Special Issue 1988; and below on Maimonides' discussion of Babel in *Guide* III:50.

[55] See *Kuzari* I:55, and above Part I. Cf. also Wolfson, "The Veracity of Scripture," p. 232.

[56] For an influential contemporary account of linguistic convention of the sort Al-Farabi describes at the first stage, see David Lewis, *Convention* (Cambridge, Harvard University Press, 1969). For a vivid informal description of the type of view of convention under attack, see also W.V. Quine's Forward to this volume.

[57] E.g. Stephanus; cf. Zimmermann's note 3, p. 11.

[58] *C.* 29.20–24; cf. also *C.* 50–51.8.

[59] See Zimmermann p. 42, nn. 1, 2, 4 on the source of Al-Farabi's discussion of these views.

[60] It should be noted that, while it is clear what is meant by the "composition" of a sentence, namely, its syntactic structure, Al-Farabi does not make clear what exactly he means by the structure, or composition, of a state of affairs, nor does he explain how the one resembles or imitates the other. The latter question, it should be added, is a general difficulty that has infected correspondence theories of truth since their inception, i.e. what is the relevant notion of correspondence?

[61] If the "composition," or structure/form, at issue here is the logical rather than grammatical structure of the sentence – which, as we explained in the previous section, is the structure of the thought signified by the sentence – the following question arises: Why does*n't* the structure of the thought *naturally* signify the structure of the corresponding state of affairs, as we would generally expect of thought/object signification? In response, I suggest that this reflects the fact, mentioned above, that our only *access* to, or *knowledge* of, thought is through language. Hence, while the structure of the thought – the structure of *what* is expressed – naturally signifies the structure of the corresponding state of affairs, the way in which the thought is expressed in language – *how* the structure of the thought is expressed – only conventionally signifies the structure of the corresponding state of affairs. So long as the correspondence is systematic and principled, there should then be no problem using the sentences as "substitutes" for the thoughts.

[62] See, for example, Saul Kripke, *Naming and Necessity* (Cambridge, Mass., Harvard Univ. Press, 1980).

[63] See Gottlob Frege, "On Sense and Meaning," in P.T. Geach and Max Black, eds., *Translations from the Philosophical Writings of Gottlob Frege*, Third Edition (Totowa, New Jersey, Rowman and Littlefield, 1980).

[64] For reasons of space, I will not discuss the heavenly spheres and separate intelligences in this paper; whether or not the problems to be discussed bear on them requires further investigation.

[65] On these senses of the term '*'Adam*,' see *Guide* I:14. On *'Adam* as ruler, see *Guide* I:2. It is unclear whether Maimonides would agree with Al-Farabi's identification of the namegiver with the lawgiver. Although there are certain analogies between the Law and language – such as, Maimonides' claim that "in all languages rules merely conform to the majority of cases" (I:67:162) and that the Law "is directed only toward the things that occur in the majority of cases" (III:34:534) – there are also significant disanalogies between them, most important, that the Law is said to be divine (i.e. natural) while language is not. The question of their relation deserves more attention than space allows here.

[66] *Guide* III:8:435; on *wudi'at*, compare I:61:149 and *ad locum*. ft. 8.

[67] On the identification of the divine and the natural, see above n. 11 and *Guide* I:39, I:66, II:40, and III:27.

[68] Cf. above ft. 54 and the references therein to Al-Farabi's *Book of Letters* and to Maimonides' *Pirkei Moshe*. On the story of Babel, see III:50:614. Note that Maimonides takes the existence of dissimilar human languages as prima facie evidence against the scriptural claim that the world was created in time and that all of humanity is descended from one human creation; i.e. he takes the diversity of natural languages to be prima facie evidence that language is natural and the world eternal. Why this should be so is not entirely clear.

[69] To state that the "notion lacks existence" is not to say something about the existence or ontological status of the notion itself – which is mental – but to say that the notion is not instantiated by any extra-mental existent; for a related point concerning essences, see Alexander Altmann, "Essence and Existence in Maimonides," reprinted in his *Studies in Religious Philosophy and Mysticism* (Ithaca, Cornell University Press, 1969), pp. 108–127; p. 111f.

[70] Although Maimonides nowhere explicitly addresses this question, his universe of discourse, the set of objects which can be signified by terms in his language, seems to include both existent and non-existent objects. That is, the objects which one's terms or notions can signify may not actually but only possibly exist; indeed they may even include impossible objects, e.g. a deity whose essence is absolutely simple and in which subsist multiple notions, which is an entity Maimonides describes as "absolute nonexistence" (I:61:147). 'Existence,' correlatively, is (in contemporary terminology) a predicate which will apply to an object depending on whether it in fact exists. To the best of my knowledge, Maimonides nowhere indicates what criterion he has for object-hood.

[71] Here I have altered Maimonides' own example which has the person apprehending in the notion of a man his animality but not his rationality, because it hardly seems plausible that one could signify a man with so weak a representation, even if the attribute in question is part of its definition. Unless Maimonides thinks that just *any* attributional particularization is sufficient to determine the signification of the associated term, the necessary thought-component must be richer than Maimonides' own example would suggest. (On particularization as constitutive of attribution, see I:58:134–5). None of these important details is, it should be noted, made clear in Maimonides' account. Similarly, it remains unclear in what *exact* way the first and second cases differ, although the general contours of Maimonides' distinction are clear enough. How, for example, does Maimonides' elephant representation, which fails to represent or signify an elephant, differ from his example of a man representation, which none the less does signify man? In the text I have called the elephant representation "incoherent" but I have not attempted to make this notion of (in)coherence clear. It is narrower than logical incoherence but broader than physical impossibility; one would hope for some intermediate notion of demonstrative or rational incoherence but this requires more investigation than present space allows; for a start, however, see Maimonides' criticisms of the *kalām* notion of admissability in I:73:206–212 and III:15.

[72] On Maimonides' other examples, 'anqā mughrib' and 'centaur,' see Al-Farabi's use of the same terms, in *C. on De Int.* 28.13–29.

[73] This view of reference might raise one last question for the contemporary reader. Suppose beliefs are composed of such representations, and beliefs are the bearers of truth. Suppose also that the individual does not have a false belief about God (or, in another of Maimonides' examples, elephants) because he has no belief about God but rather a belief about some imaginary non-existent entity – call it Ged. Does he then have a *true* (or, for that matter, a false) belief *about Ged* (since his representation does, by hypothesis, signify Ged and attributes some property to it)? Or does his imaginary belief lack all truth-value? Although he gives no argument for his answer, Maimonides does seem to state that such a belief is false – and false *because* the thing signified does not exist. Whether this is because every sentence carries an existential presupposition requires further investigation.

[74] Because designation involves signification by nature, the competent speaker of language must, therefore, *know* the natures, or at least distinguishing attributes, of the entities to which he wishes to refer. This may or may not be a plausible description of our actual practices of signification, but it may be another reason – as I alluded at the end of Part IV – why Maimonides includes the subject of language in his exposition of *ma'aseh bereshit*.

[75] Throughout this passage, Maimonides makes use of the two classical Arabic terms of logic, *taṣawwur* and *taṣdiq* (Heb: *tziyur* and *'imut*). Literally, *taṣawwur* is the act of grasping or receiving a form in the mind, the act of conception or representation; *taṣdiq*, the act of taking or believing something to be true (*ṣadiq*), the act of affirmation or verification. But the same terms also come to serve for the objects of those mental acts. Properly speaking, truth and falsity, and therefore belief, have only to do with *taṣdiq*. In this role, the object of *tasdiq* corresponds to the modern notion of a proposition, although this proposition-like object of *taṣdiq* should also (unlike certain modern conceptions of the proposition) be distinguished from the sentence uttered in the act of affirmation. On the *taṣawwur/taṣdiq* distinction, see the classic article by H.A. Wolfson, "The Terms *Taṣawwur* and *Taṣdiq* in Arabic Philosophy and their Greek, Latin, and Hebrew Equivalents,"' repr. in his *Studies in the History of Philosophy and Religion*, eds., I. Twersky and G.H. Williams (Cambridge, Harvard U. Press, 1973), pp. 478–492; and Sabra, p. 758ff. (and references therein).

[76] Here, as well as in I:50 and in II:5 (in connection with the spheres), Maimonides cites as prooftext Ps. 4:5. For further examples of the priority of internal over external speech, see *Guide* I:51:113f; I:60:144; II:12:279–80; III:8:432–3; and *Mishneh Torah Hilkhot De'ot*, 2:4: "Similarly, in matters of Torah and wisdom [*hokhmah*] one's words should be few and his thoughts [*inyaneihem*] many." '*Inyan*' was the standard translation of '*ma'nā*' in medieval philosophical Hebrew.

[77] See Abraham Nuriel, "The Torah Speaks According to the Language of the Sons of Man," (Heb.) in M. Hallamish and A. Kasher, eds., *Religion and Language: General and Jewish Philosophical Essays* (Tel Aviv, University Publishing Projects, 1981). Nuriel does not, however, note Maimonides' shift in I:57:133 in his truncated use of the phrase "according to the language of the sons of man (*ke-leshon benei 'adam*)," from signifying the language of the multitude to signifying the language of the species of humanity – the species distinguished by its faculty of speech or reason – namely, the language of intellectual apprehension and thought.

[78] Altmann, "Maimonides on the Intellect," p. 120.

[79] See H.A. Wolfson, in (among other places) his "Maimonides on Negative Attributes," rep. in his *Studies in the History of Philosophy and Religion*, vol. II, pp. 195–230. Although Wolfson was the first to sharply distinguish between the "metaphysical" and "logical" problems of divine attributes, I

disagree with his interpretation of the "logical" problem. On Wolfson's interpretation, see now Altmann's critical discussion, in "Maimonides on the Intellect," pp. 122–4. Furthermore, it should be noted that Wolfson's solution to his "logical" problem would be more accurately described as a pragmatic rather than logical solution. According to Wolfson, despite the fact that all predicative statements about God are tautologies, they can none the less be "useful," i.e. pragmatically informative, in contexts where they serve as an answer to a challenge, e.g. where they "*emphasize* ... the negation of something which otherwise might be considered as admissable of God ... As the answer to the *challenge* that A is B, it is necessary to affirm that A is A in order to *emphasize* that A is not B" (p. 204, my emphasis).

[80] That Maimonides saw the difference between the two questions is clear from a number of remarks. The existence of certain divine attributes – and the problem of compositionality which they raise – is said to be "consider[ed] to be cognized by the intellect" independently of whether those attributes are or are not found in "the text of the word of a prophet" (I:55:121) and, therefore, independently of any exegetical need. Maimonides also envisions a messianic age when the two questions will coincide, when people will invoke God by one and only one name which will correspond to the unique notion or representation that can be intellectually apprehended about God (I:61:148–9). During the present age, however, the two questions, the exegetical and the normative, diverge.

[81] See Seymour Feldman, "A Scholastic Misinterpretation of Maimonides' Doctrine of Divine Attributes," *Journal of Jewish Studies*, vol. 19 (1968): 23–39.

[82] See Altmann, "Essence and Existence in Maimonides."

[83] Fazlur Rahman, "Ibn Sina's Theory of the God-World Relationship," in Bernard McGinn and David Burrell, eds., *God and Creation* (Notre Dame, Ind., University of Notre Dame Press, 1990), pp. 38–52, p. 38.

[84] Cf. Altmann, "Maimonides on the Intellect," p. 119, n. 75.

[85] See below for implications of this interpretation for Maimonides' Avicennean argument for the existence of a necessarily existent being in *Guide* II:1. Despite the differences in argument, nothing I have said conflicts with the claim that the *source* of Maimonides' distinction in I:57 is Avicenna. On the Mu'tazilite sources of the formulae such as "living but not through life," see H.A. Wolfson, *Repercussions*, pp. 73–4.

[86] The illicit causal presuppositions of compositionality are Maimonides' central arguments for the unity of God in II:1:250–1.

[87] Compare Maimonides' argument for the unity of God in *Mishneh Torah, Book of Knowledge*, "Laws concerning the Foundations of the Law," I:7.

[88] Compare Maimonides' argument against divine corporeality in II:1:251–2.

[89] For the example of the wall, cf. Al-Farabi, *C. on De Int.* 38.9, Zimmermann's appended note on p. 259, and Maimonides' *Logic*, ch. 11. On categorical negation, see also Al-Farabi's discussion in the *C.* 38.1–39.18 and 107.9–125.24 and the medieval Hebrew commentaries on the *Guide, ad. loc.*, of Moses of Narbonne, (*Be'ur*, Ed., J. Goldenthal, 1832), p. 10; Shem Tob ibn Shem Tob, Efodi, and Asher Crescas (the last three all reprinted in the standard edition of the Ibn Tibbon Hebrew translation of the *Guide*). The medieval Hebrew term for categorical (as opposed to particular) negation was *shelilah mushlahat* or *kellalit* (lit.: absolute or general negation). For further discussion, see Wolfson, "Negative Attributes," *op. cit.*

[90] *C. on De Int.* 125.11–23. According to Al-Farabi, "a noun ... becomes indefinite when the negative particle, i.e. the particle 'not,' is linked with it in such a way that together the two words assume the shape of a single expression" (*Short Treatise on Aristotle's De Interpretatione*, 39 ff.). Such nouns, he emphasizes, are not negative phrases because, like single expressions, they have affirmative significations, namely, kinds of privation. On this, see further *C. on De Int.*, 32.1–8, 38.1–39.18.

There is, I would propose, additional circumstantial evidence that Maimonides may have had this Al-Farabian passage in mind while writing I:58. Following the passage quoted in the text, Al-Farabi goes on to illustrate the indefinite noun with the example of the indefinite nouns 'not-heavy' and 'not-light' as applied to heavenly bodies. Following this example, he writes enigmatically: "What we have said is not without problems. But to say more than this would be to go beyond the limits of logical inquiry. It must suffice to have pointed out as much as this" (*C. on De Int.* 125.15–23). This last example is especially intriguing because Maimonides' discussion of categorical denial, which he illustrates with the same example as Al-Farabi, the unseeing wall, is also followed by a digression addressed to "you who read this Treatise with speculative intent." In this digression he takes up the limitations of human knowledge with respect to celestial phenomena and its implications for the meaning of our affirmative descriptions of the heavens. Adopting the same example as Al-Farabi, Maimonides says, "we are unable to predicate of [the heavens] any attributes

except in terms whose meaning is not completely understood ... Accordingly we say that the heavens are neither light nor heavy ... and we make other negations of this kind. All this is due to our ignorance with regard to that matter" (I:58; cf. also II:22). Both in the case of the heavens and in the case of God, Maimonides gives a solution different from Al-Farabi's. However, since there is no other apparent reason why Maimonides should introduce this digression where he does, it would seem most plausible that it was Al-Farabi's juxtaposition of the deity with the heavens that influenced Maimonides' decision in *Guide* I:58 also to juxtapose the two.

[91] In fact, even this way of solving the problem remains incomplete: only two of the eight predicates discussed in this passage are given explicit action interpretations (although not all of them strictly speaking involve privations, e.g. multiplicity or being uncaused). Furthermore, the passage vacillates between more straightforward action description (like that found in I:54) and neo-platonic emanationist description. The relation between these two requires further investigation.

[92] Maimonides *explicitly* describes the problem in terms of affirmative attributes in order, I think, to emphasize the superiority of negative attributes to affirmative ones as a solution to the exegetical problem of attributes. For obvious reasons, Maimonides openly plays down the normative question throughout the last three chapters I:58–60.

[93] I am indebted here to Moshe Habertal for sharpening this issue in my mind.

[94] Cf. also I:60:145 according to which even the bare distinction between substratum and adjunct implies "polytheism." "For every substratum bearing things is undoubtedly, according to its definition, a duality, *even if it be one in its existence. For the notion of the substratum is different from that of the adjunct borne by it.*" And this, in turn, conflicts with "the demonstration of the impossibility of composition in Him ... and, to go even further, the demonstration of His absolute simplicity" (I:60:145). Here also the composition is structural rather than a matter of different autonomous parts compounded together.

[95] On possible Ismaili influences on Maimonides' conception of negative attributes reflected in this passage, see Shlomo Pines, "Shi'ite terms and conceptions in Judah Halevi's *Kuzari*," *Jerusalem Studies in Arabic and Islam* II (1980): 165–251, Appendix VI, p. 240–243; idem., Translator's Introduction, pp. xlvff.

[96] Cf. Al-Farabi, *C.* on *De Int.* 38.14–39.3.

[97] Cf. also Altmann, "Essence and Existence in Maimonides," p. 110f.

[98] On the dominating negative influence of the imagination on the mental representation of immaterial entities in general, see *Guide* II:12:279–80.

[99] See Al-Farabi's *Short Treatise*, 52–53, pp. 230, especially n. 4, and Zimmermann's discussion in his Introduction, p. xxiv–xxxviii; especially xxxviii. Maimonides' Arabic term for 'derived' is the same as Al-Farabi's term *al-ism al-mushtaqq* which he uses for 'derived terms' and which Zimmermann explains is the "paronym" of the Greek school tradition. Although the term '*ishtiqaq*' [derivation] is borrowed from Arab grammar and philology where it means etymology (which may be reflected in Maimonides' first sense of 'derived'), in the logical tradition it comes to designate derivative nouns like adjectives and participles.

[100] Shlomo Pines, "Dieu et l'être selon Maïmonide: Exégèse d'Exode 3, 14 et Doctrine Connexe," in A. de Libera et E. Zum Brunn, eds., *Celui qui Est: Interprétations Juives et Chrétiennes d'Exode 3, 14* (Collection Patremaines, Editions du Cerf, Paris 1986), pp. 15–24; p. 17 and notes ad loc.; idem. "Lés textes arabes dits plotiniens et le courant 'porphyrien' dans le néoplatonisme grec," in *Le Néo-Platonisme* (Paris, 1971): 303–317; reprinted in *Collected Works of Shlomo Pines* (Jerusalem, Magnes, 1986), vol. II. (My special thanks to Sarah Stroumsa and Zev Harvey for bringing these papers to my attention.) On *'anniyya*, see also F. Rosenthal, *Orientalia*, 21 (1952): 474–479, and Joel Kraemer's discussion in the works cited in n. 21. For an excellent summary and evaluation of the scholarly debate over *'anniyya* in connection with the claims of this paper, see now W.Z. Harvey and S. Harvey, "A Note on the Arabic Term *'Anniyya/'Aniyya/'Inniyya*" (in Heb.), *Iyyun* (April 1989): 167–71. On Maimonides' own sensitivity to the problems of translating into Hebrew the subtlely different terms for existence in Arabic, see his revealing comment in *Guide* I:63 that "there is no difference whether you say 'was' or 'existed' *in Hebrew*" (my emphasis), implying, of course, that there is all the difference philosophically between the two terms.

[101] For Munk's view, see *Le guide des égarés*, vol. 1, p. 241, n. 2; Baladi expresses his opinion in the transcribed oral discussion of Pines' paper "Lés textes arabes," appended to its published version, p. 316. It should be noted that, despite his view expressed in the above papers, Pines himself translates *'anniyya* in some of the above passages in this very way.

[102] For D'Alverny, see also the discussion appended to Pines' paper, "Lés textes arabes"; for Kafih, see his Hebrew translation of the *Guide* (Jerusalem, Mossad HaRav Kook, 1972), vol. 1, pp. 141–2, 144.

[103] For Vajda, see also the oral discussion following Pines' "Lés textes arabes," p. 317. Al-Farabi's explication is found both in his *Kitāb al-Alfāz* (ed., M. Mahdi, p. 45) and in his *Kitāb al-Harūf* (ed., M. Mahdi, p. 61). It should also be noted that, according to Al-Farabi's interpretation, the expression in question should be vocalized *'inniyyah* rather than *'anniyyah*.

[104] See Harvey and Harvey, op. cit. None the less they argue for the Vajda/Al-Farabi explication, in large part because of Maimonides' high regard for Al-Farabi's logical works.

[105] For this view, and discussion of it, see the papers of Pines, Altmann, Hyman, Kogan, Kraemer, and this author, cited earlier in n. 38.

[106] On the "greatest proof" from the motion of the heavens, see also Maimonides' skeptical (and apparently contradictory) claim in II:24:327 that "even the general conclusion that may be drawn from [the heavens], namely, that they prove the existence of their Mover, is a matter the knowledge of which cannot be reached by human intellects." On these apparently contradictory passages, see Pines, "Translator's Introduction," pp. cxii–cxiv, and Kraemer, "Maimonides on Aristotle and Scientific Method," op. cit. pp. 79ff, who also emphasizes the dialectical character of Maimonides' argument. Throughout these passages on the "proof" from the motion of the heavens, note too that Maimonides uses the Arabic term *dalīl*, which refers to persuasive (usually dialectical but sometimes also rhetorical) arguments that lead to accepted opinions, rather than the term *burhān* which he reserves for demonstrations that lead to certain knowledge. A full evaluation of Maimonides' view of the relation between the Necessasry Existent and First Mover must take all these differences of argumentative style and terminology into account. Finally, compare also Maimonides' apparently contradictory discussions of the role of the imagination and intellect in deciding questions of possibility and necessity, in *Guide* I:73 and III:15, a contradiction first pointed out by Emil Fackenheim, "The Possibility of the Universe in Al-Farabi, Ibn Sina, and Maimonides," reprinted in Arthur Hyman, ed., *Essays in Medieval Jewish and Islamic Philosophy* (New York, Ktav, 1977), pp. 303–334; p. 324, n. 61, which has not, to my knowledge, been satisfactorily explained to date.

Note added in proof (November 1999): Since submission of this paper in 1988, in a number of late publications and lectures I have elaborated, refined, and qualified the 'skeptical' interpretation of Maimonides' philosophy first broached here in the argument for the impossibility of propositional knowledge about the deity based on the syntactic problem of divine attributes. On the difference between subjects with respect to which our knowledge is limited (e.g. cosmology and astronomy) and those about which it is humanly impossible to have knowledge (e.g. the deity), see my "Maimonides on the Growth of Knowledge and the Limitations of the Intellect," to appear in Tony Levy, ed., *Maimonide: Traditions philosophiques et scientifiques médievales arabe, hébraique, latine*. For the implications of this argument from divine attributes for Maimonides' conception of intellectual happiness and spiritual worship, for broader epistemological and ethical consequences of his view of matter and the body, and for additional examples of skeptical arguments in the *Guide*, see my "Maimonides in the Skeptical Tradition," ms. and *The Matter and Form of Maimonides' Guide* (Cambridge, Harvard University Press, forthcoming 2002). In these writings, I also elaborate the role of the imagination in Maimonides' theory of internal representations and revise details in my reconstruction of the argument in I:50–63. On one implication of Maimonides' skepticism for his conception of prophecy and law, see also my *Problems and Parables of Law* (Albany, SUNY Press, 1998): 128–133. I should also mention two important articles that have subsequently appeared that address the issues raised in this paper and are critical of my position: Herbert Davidson, "Maimonides on Metaphysical Knowledge," *Maimonidean Studies*, ed. A. Hyman (New York, Ktav, vol. 3, 1992–3): 49–103 and Alfred Ivry, "The Logical and Scientific Premises of Maimonides' Thought," in *Perspectives on Jewish Thought and Mysticism*, eds. A.L. Ivry, E.R.W. Wolfson and A. Arkush (Amsterdam, Harwood, 1998): 63–97. Lack of space precluded responses to their criticisms in this essay, but I address both in the aforementioned articles and book.

ISADORE TWERSKY

ASPECTS OF MAIMONIDES' EPISTEMOLOGY: HALAKAH AND SCIENCE[1]

I

A. In contradistinction to the epistemology of classical philosophers or, more precisely, in a carefully premeditated expansion of the classical epistemological doctrine which recognized sense perception, primary premises (axioms), and scientific data (derivative knowledge) as sources of knowledge, the epistemology of medieval religious philosophers recognized not only these three but also tradition, true reliable tradition (received from the prophets or the wise men), as a supplementary source of knowledge. Maimonides writes in the *Letter on Astrology* – a document of particular importance for understanding the significance of science and philosophy in his thought and in which, as he himself emphasizes, statements elaborated elsewhere are reflected – as follows:

> Know, my masters, that it is not proper for a man to accept as trustworthy anything other than one of these three things. The first is a thing for which there is a clear proof deriving from man's reasoning such as arithmetic, geometry, and astronomy. The second is a thing that a man perceives through one of the five senses such as when he knows with certainty that this is red and this is black. The third is a thing that man receives from the prophets or from the righteous.[2]

Maimonides then goes on to urge his readers clearly to identify each of these sources and not to blur them:

> Every reasonable man ought to distinguish in his mind and thought all the things that he accepts as trustworthy and say: 'This I accept as trustworthy because of tradition and this because of sense-perception and this on grounds of reason.'
>
> Anyone who accepts as trustworthy anything that is not of these three species of him it is said: 'The simple believes everything.' (Prov. 14:15).[3]

R.S. Cohen and H. Levine (eds.), Maimonides and the Sciences, 227–243.
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One consequence of this epistemological classification, emphasized by Maimonides, is that not everything written in a book is wisdom or truth; for a statement to be valid and trustworthy, it must be based on one or more of the sources of knowledge.[4]

In his study of the double-faith theory, Professor Wolfson summarized this epistemological development as follows: "revelation was a new immediate source of knowledge in addition to the sources enumerated by the Greek philosophers."[5] Apparent contradictions between these sources had to be resolved by meticulous re-examination of all data. Hence, I would submit that Maimonides' statement in a historical chapter of the *Guide* that the Andalusians – i.e. his Spanish predecessors – "cling to the affirmation of the philosophers and incline to their opinion insofar as these do not ruin the foundation of the Law"[6] reflects the dynamics of his epistemology which provides for the elimination of apparent contradictions between the various sources of knowledge by means of interpretation and re-interpretation. Not even Aristotle, the chief of the philosophers,[7] reigns supreme; philosophers who are opposed to religious principles may be faulty or shoddy and their teachings subject to correction (just as inaccurate sense perception or flawed scientific knowledge would be corrected). A medieval religious philosopher – and Maimonides was such a person – could not be a mindless follower of Aristotle; he had judiciously and rigorously to combine philosophic affirmations with religious foundations.

B. The significance of this epistemological expansion for the realm of beliefs and opinions is well known, and the role of harmonization (which *eo ipso* entails the recognition of conflict) between philosophy and religion has received considerable scholarly attention. However, the question of whether there is a parallel process of confrontation and harmonization in the realm of halakah – juridical facts, beliefs, norms and assumptions – still awaits careful, judicious investigation. This paper proposes to outline an approach to the examination of the relationship between halakah and science in the Maimonidean corpus, with special attention to his great code of Jewish law. We are not dealing with the underlying logical, methodological, and ideological issue of faith and reason, not with such themes as the unity and incorporeality of God, creation, prophecy, miracles, divine foreknowledge, providence, ethical and political theory, nature of soul and spirit, attitude to death, immortality – all of which figure in the *Mishneh Torah*. Similarly, we need not concern ourselves with abstract views on science found in various parts of the Maimonidean corpus, with his attempt to formulate a comprehensive, unified physical theory (*Guide*, II, 13), with his comments on the problem of the incompatibility of Aristotelian physics and Ptolemaic astronomy (III, 14; 11, 8) or with his ideas concerning progress in certain scientific disciplines (especially mathematics). In fact, we need not even concern ourselves directly with his few scientific opuscula (*Treatise on Logic, Treatise on Intercalation of the Calendar*, assorted medical works). By turning to his halakic works – the *Mishneh Torah*, the Commentary on the Mishnah and, in some cases the *Sefer ha-Mizvot* – we get a

sharply focused view of halakah and science. The *Mishneh Torah* – and the same is true for the Commentary on the Mishnah,[8] which Maimonides describes as containing all his explanations as well as whatever he attained from the study of science (*ilm*) – has an unmistakable scientific ambience, nurtured by such items as the identification of *ma'aseh bereshit* with natural science, thematic references to mathematics, geometry, astronomy and astrology, medicine, dietetics, psychology, and literary references to works on medicine, geometry, astronomy (and in the Commentary on the Mishnah, *Terumot* I, 2) to a *Quaestiones Naturales, She'elot Tiv'iyot*) as well as frequent scientific allusions and obiter dicta. The paramount importance of science, of comprehensive scientific knowledge, is perhaps most emphatically underscored by the dramatic recognition of its role as a conduit for knowledge and love of God.[9]

His proficiency in the exact sciences is amply demonstrated in the *Mishnet Torah*, especially in the presentation of an entire system of astronomical theory; the structure, comprehensiveness, and authoritativeness of this part of the code made it clear to all readers, admiring and critical alike, that Maimonides was a master of the field.[10] The late Professor Solomon Gandz has shown that the section entitled *Hilkot Kiddush ha-Hodesh* (Sanctification of the New Moon) is really a two-tiered construction. In chapters 1–10 the old Jewish laws concerning the regulation of the calendar on the basis of observation of astronomical phenomena and the additional Jewish methods relating to the regulation of the calendar on the basis of independent scientific calculation are analytically described, while the last nine chapters form a new section which deals with the astronomy of the visibility of the new moon, an extraneous matter taken from extraneous sources.[11] It is worth noting that Maimonides considered this material sufficiently important and sufficiently integral topics of law that he concluded this remarkable section with a resounding peroration:

> We have now expounded all the methods of calculation required for the determination of the visibility of the new moon and for the examination of witnesses, so that discerning students might be able to learn everything about it. Thus they shall not miss this particular branch of the many branches of the Law and will have no need to roam and ramble about in other books in search of information on matters set forth in this treatise. 'Seek out of the book of the Lord and read; none of these [truths] shall be missing.' (Is. 34:16).[12]

Astronomy of the visibility of the new moon is thus not really extraneous after all.

C. We get a clear idea of his extensive, omnivorous reading from the scope of these extra-halakic references – i.e. they provide an oblique empirical substantiation of various personal-autobiographical statements. We should be attentive to the fact that, in various contexts, Maimonides mentions his reading

interests and study habits: "When I studied the books of the Mutakallimun, as far as I had the opportunity and I have likewise studied the books of the philosophers as far as my capacity went."[13] Elsewhere we find "the excellent philosophers Abu Bakr ibn al-Saigh, under the guidance of one of whose pupils I have read texts ..."[14] (In another context he mentions what he has heard about the astronomical system of Abu Bakr but qualifies it by adding "however, I have not heard this from his pupils.")[15] He says about his reading on astrology and idolatry " that it seems to me there does not remain in the world a composition of this subject, having been translated into Arabic from other languages, but that I have read it and have understood its subject matter and have plumbed the depths of its thought,"[16] and this ambitious pattern of exhaustive study is probably applicable to most other fields. His statement on medicine likewise underscores his commitment to know and analyze the sources of everything: "For you know how long and difficult this art is for a conscientious and exact man who does not want to state anything which he cannot support by argument and without knowing where it has been said and how it can be demonstrated."[17] Maimonides was unquestionably a conscientious and exact man; he sought out and used all sources. I am, therefore, inclined to offer a friendly emendation to the comment of Professor S. Pines who, after noting Maimonides' references to "some Arabic scientists as distinct from the philosophers," offers this reserved, restrained summation: "Quite evidently, he had a knowledge of scientific literature that would have been regarded as adequate in the philosophic circles of his time."[18] It seems that, if we add to this the statements in the *Mishneh Torah*, and Commentary on The Mishnah and all the references scattered in his smaller treatises and letters – and what we now know about his mathematical writings as well[19] – we could say that he had a knowledge of scientific literature that would have been regarded as *impressive* if not encyclopedic.

To these references concerning his reading and study habits should be added the references concerning his teaching habits. He was a reader in the modern academic sense; he also *read* this literature with students and tutored them, either individually or in small groups. For example, he says to his student for whom he composed the *Guide*: "You know of astronomical matters what you have *read* under my guidance and understood from the contents of the *Almagest*."[20] This reminds us of Maimonides' more elaborate, emphatic statement in the *Dedicatory Epistle*: "When you came to me, having conceived the intention of journeying from the country farthest away in order *to read texts* under my guidance ..." He proceeds to praise this young Joseph ben Judah by noting:

> When thereupon *you read under my guidance* texts dealing with the science of astronomy and prior to that texts dealing with mathematics ... my joy in you increases because of the excellence of your mind and the quickness of your grasp. I saw that your longing for mathematics was great and hence I let you train yourself in that science, knowing where you would end. When

thereupon you read under my guidance texts dealing with the art of logic, my hopes fastened upon you.[21]

That this was not an isolated instance we may infer from the statement of Al-Qifti in his *History of Physicians* that "people studied philosophy under him"; this is the same Al-Qifti who reported that Maimonides had mastered mathematics.

It is well known that many of Maimonides' letters comment on or describe facets of his medical career.[22]

I would also note here the ease and naturalness, totally devoid of self-consciousness or the slightest twinge of apology, with which he refers to general scientific literature. Even in the heat of argument, when he had to rebut an uncongenial critic who mingled specific queries about the *Mishneh Torah* with sweeping accusations about its author, and generally in defending the legitimacy and usefulness of his Code, Maimonides refers nonchalantly to the fact that "any author who wrote a book dealing with Torah or with other sciences, whether the author was from among the ancient nations in possession of philosophy or from among the physicians, would necessarily adopt one of two opinions."[23] I find this rather striking. The candor and spontaneity underscore the fact that the universality of reference, and of perception, was completely routine and unrehearsed; this was Maimonides' natural, indispensable mode of writing and thinking.

It is significant – and especially so for our purposes – that in the long, carefully-crafted answer to the question about astrology (what to believe and what not to believe), Maimonides says that, had the respected scholars of southern France already received the *Mishneh Torah*, they would not have raised the question they did, because everything is clarified by his formulations in that work. The *Mishneh Torah*, in other words, reflects his positions and attitudes on epistemology and science, on reason, tradition, and unacceptable notions.[24] Analogously, in the Treatise on Resurrection he observes that only people of religion and science (*al-din* and *al-ilm*)[25] will appreciate the excellence of the *Mishneh Torah* for, obviously, it contains more than just an ordinary summation of positive law, and special sensibilities are required to appraise its excellence. It is a good barometer of his attitudes and positions, it reflects his methodology and philosophy, and therefore only properly qualified readers will properly gauge its achievement.

D. Leo Strauss, the great lover of paradox, commented in his "Notes on Maimonides' Book of Knowledge": "This would seem to mean that in an important respect Maimonides' *fiqh* (talmud) books are more 'philosophic' than the Guide."[26]

In light of this, I seek to determine Maimonides' attitudes to science, or the impact of science on the normative formulations of halakah. The primary source material will be drawn from his halakic works. What will emerge is that there is a meticulous attempt to integrate science, to relate scientific vocabulary and axiology to rabbinic law and lore, to acknowledge its normativeness and

regulative autonomy, but not to superimpose it forcibly on the structure and fabric of halakah. Certain areas must remain independent of science while some areas transcend it. Maimonides, I shall suggest, provides a blueprint for a three-tiered structure: unification, separation, transcendence.

II

A. Maimonides' philosophical-scientific posture was perceptively described by R. Moses Nahmanides when he said: "he diminishes miracles and augments nature."[27] This epigrammatic characterization, although submitted by Nahmanides in criticism of Maimonides, may actually echo Maimonides' own statements; in the Letter on Resurrection,[28] e.g. he sharply contrasts the masses who delight in setting up Torah and reason as contradictory poles and shun seeing any phenomenon as natural (*davar 'al minhag ha-teva'*), either in descriptions of the past, observations of the present, or promises of the future, with himself and his like who try to harmonize Torah and reason and regard all things as following a possible natural order. Similar statements – with such perception or self-perception – are found elsewhere as well. Maimonides may have said it all very tersely and epigrammatically when he described the purpose of the *Mishneh Torah* as "lekarev ha-devarim el ha-sekel 'o el derek ha-rov."[29] There has been abundant discussion and little consensus in recent scholarly literature about the second part of this statement (*derek ha-rov*), but the very suggestive first part should not be overlooked. It is a clear and distinct declaration of purpose and procedure. Moreover, while Nahmanides addressed himself, in the first instance, to the issue of natural law versus miracles – the philosophic preoccupation with the permanence and stability of the universe and the fear of any disruptive phenomena or destabilizing possibilities – Maimonides' own statements are more general in intent and are, in fact, accurate markers of his essential scientific temper. The fact that they are applied to the *Mishneh Torah* is especially significant for us.

If we had to, as we must because of time constraints, isolate one issue, Maimonides' attitude to magic and medicine is most emblematic. Medicine, of course, plays a great role in his life and writing; Galen is a major influence.[30] Maimonides' writings show that he is fully aware of the relevance and importance of medicine, is indeed a firm believer in medicine and hygiene.[31] While mindful of the difference between medicine and religion,[32] he is a genuine enthusiast of medicine. He has no reservations whatsoever, religious or otherwise, theoretical or practical, about its permissibility; it is, to be sure, obligatory.[33] Medical perspective may even have led him to explain the details of a certain law about visiting the sick differently than in the Talmud; this was, in any event, the opinion of R. David ibn Zimra.[34]

Most important, his writing is a good illustration of the empiricist and experimentalist temper in the development of medieval medicine. Maimonides' attitude is similar to that formulated by his contemporary Abu'l Barakat: "medicine derives for the greater part from experiments and inferences based on the principles of physics."[35] Medical procedures should be as scientific as

possible; the determination whether or not a particular drug has curative properties should follow from reason or experience. Indeed only such procedures and the use of such drugs warrant the violation of the Sabbath in an effort to save or prolong life.[36] If not for the concept of medicine, the idea of reasonable and effective therapeutic procedure, there would be no concept of *piku'ah nefesh*. In the *Mishneh Torah* (*Hilkot Shabbat* II, 1) Maimonides formulates the halakah simply and forcefully: "The Commandment of the Sabbath, like all other commandments, may be set aside if human life is in danger. Accordingly, if a person is dangerously ill, *whatever a skilled local physician considers necessary* may be done for him on the Sabbath." According to the Maimonidean explanation put forth in the Mishnah Commentary on *Pesaḥim*, the *Book of Remedies* which King Hezekiah destroyed contained magical procedures and astrological cures; his act was *not* a demonstration of skepticism of or antagonism toward medical science and practice. It was an affirmation of medicine and a negation of magic.

Maimonides' unconditionally negative attitude to assorted medical practices – e.g. incantations – is neatly correlated with an uncompromisingly positive attitude toward genuine medical practices. His scientific temper, the empiricist-experimentalist one, is dramatically underscored by the fact that not only does he condemn magical procedures but he also rules out the therapeutic-practical use of sacred objects, lest they be converted into amulets. Note this resounding formulation:

> One who whispers a spell over a wound, at the same time reciting a verse from the Torah, one who recites a verse over a child to save it from terrors, and one who places a Scroll or phylacteries on an infant to induce it to sleep are not in the category of sorcerers and soothsayers, but they are included among those who repudiate the Torah; for they use its words to cure the body whereas these are only medicine for the soul, as it is said, 'They shall be life to your soul.' (Prov. 3:23).[27]

Ḳedushah (holiness) generally is interpreted to mean transcendence; it is not an intrinsic quality which can be transferred from the sacred object to its users or admirers. One may say that Maimonides' concept of the sacred and the resultant spiritualization of laws (which I have dealt with elsewhere)[38] serves, inter alia, a scientific purpose: to neutralize magical procedures and/or magical consequences. The Torah, while interested in the well-being of the body (*tiḳḳun ha-guf*, and prescribing laws which are conducive to it), is medicine for the soul (*refu'at ha-nefesh*).[39] There is no need to attempt, or be tempted, to rely upon supernatural effects flowing from sacred objects inasmuch as the Torah commands and commends natural science. Natural-scientific procedures are congruent with the Torah's goals for individual welfare. The Torah has its distinct, spiritual, other-worldly teleology of life, but it yields completely to the imperative to prolong life in this world; in this context, it endorses the best empirical results in the field of medicine, to the exclusion of magical procedures as well as improper use of sacred objects.

There is much that is novel in this position; it is established and sustained by sharp exegesis, innovative interpretation and unrelenting polemics. As we shall see, here as elsewhere, he had to balance naturalism with supernaturalism. He had, for example, to demolish the widespread view which, for misguided religious reasons, condemned the reliance upon medicine as if medicine was an unwarranted, even arrogant, naturalistic intrusion upon, or attenuation of religious belief. An indication of how novel his position was in the history of its reception and rejection: it was periodically disavowed throughout the generations; his demolition was demolished, a kind of *tahafut 'al-tahafut*. As recently as a generation ago the great R. Abraham Karelitz, the Hazon Ish, affirms that the view, angrily and disdainfully characterized by Maimonides as empty, foolish, and fanciful and resoundingly rejected by him, is in truth a profound, impregnable tradition; it is Maimonides' alternate proposal which is problematic and difficult to sustain.[40]

The whole issue demanded concerted effort and considerable ingenuity. Many Talmudic passages had to be presented in new perspectives or transposed to new contexts or conceptualized in new ways. Demonology was derailed; belief in talismans and amulets was undermined. The transcendental purity of sacral objects was preserved.

This process of interpretation and conceptualization, which could be and was frequently challenged and criticized (Nahmanides could say, e.g. after referring to *Hilkot 'Akum* XI, 9 that "the texts are against it"),[41] was particularly crucial in this context. Magical acts were not buttressed by logical considerations or propositions of natural causality. There is no scientific-rational connection between whispering a spell over a wound and restoration of good health. The only epistemological support and justification would consequently have to come from religious tradition. It is, therefore, incumbent upon Maimonides to demonstrate that tradition does not legitimize any of these magical procedures or astrological beliefs. If, as I cited earlier, "every reasonable man ought to distinguish in his mind and thought all the things that he accepts as trustworthy and say "this I accept as trustworthy because of tradition, and this because of sense-perception and this on grounds of reason,'" he will realize that he has no support from any of the recognized sources of knowledge. Identification of the sources of knowledge will help filter out untrustworthy and unworthy beliefs. Hence, Maimonides' sweeping program of interpretation was mandated by epistemology. Sharp and, in his opinion, compelling interpretation was his incontestable prerogative. Rabbi Abraham ben David said in another context: this author possesses great (interpretive) powers and is thus able to interpret matters as he sees fit.[42] The critical intent of the remark does not invalidate the insightfulness of the characterization which underscores the central importance of the interpretive process.

III

A. Constraints of time prevent us from discussing in detail other areas in which scientific data are paramount. Suffice it to mention, without elaboration for the moment, that the introduction of the concept *tevah*, signifying nature of physical properties as well as nature of human beings, is very repercussive. *Tevah* is apparently a neologism[43] suggesting necessity, compulsion, inexorable causality – often synonymous or interchangeable with *minhag* or *minhago shel 'olam*; the latter denotes nature and natural law as distinct from miracle, i.e. something which challenges the regularity and immutability of nature.[44]

Hilkot Temurah IV, 13 is an important example of *tevah* applied to human nature, i.e. to the area of psychological explanations. It is man's nature (*tevah shel 'adam*) to increase his possessions and to be sparing of his wealth. The Torah is concerned with the tendency of human nature which places a premium on material self-interest and cultivates excessive parsimony. This may even lead one who dedicates an object to God to yield a fickleness and fluidity of motive, and try to shortchange Him. Hence, the Torah intervenes in order to channel and quality this natural propensity; it does not change the fact of human nature but disciplines and curtails certain traits.[45]

We should also call attention to an intriguing halakic formulation in which scientific knowledge determines the applicability of the juridical norm.

> It is well known to wise men endowed with understanding and knowledge that the sun is 170 times larger than the earth. If an ordinary person swears that the sun is larger than the earth, he is not liable to flogging because of false oath. For although the fact is as stated, this is not commonly known to any but the most eminent scholars, and no person is liable unless he swears about a thing well known to at least three ordinary persons, e.g. that a man is a man, or a stone a stone. Similarly, if he swears that the sun is smaller than the earth, even though this is not so, and it is therefore not like swearing that a man is a woman, as he is merely swearing about the way the sun appears to him, and he does indeed see it small. This holds good in all similar cases connected with calculations dealing with astronomical cycles, constellations, and geometrical measurements, and other scientific matters which are known only to some men.[46]

B. In light of this, Maimonides' statement on *terefah* (organic disease which is deemed fatal) in animals, with its unequivocal pronouncement that scientific-medical opinion is irrelevant to this halakic complex, is striking. The passage in *Hilkot Shehitah*,[47] based on tractate Hullin, with some stylistic-substantive additions, deserves exceedingly careful study. The sharp Maimonides formulation is even more noteworthy if we recall that in a subsequent chapter Maimonides re-affirms unequivocally the decisive role of doctors in determining and defining *terefah* in human beings.[48] Maimonides is telling us that the list of seventy kinds of *terefah* is traditional, matter-of-fact, and therefore he extricated it from the constraints of science. Tradition is the exclusive determinant. There was no room or possibility in this context for re-interpreta-

tion, so he removed the matter from the orbit of science. He would not allow scientific data or assumptions to change the halakah. By so doing, he is in fact free of apologetics. Comparison with the position of Rashbah puts the significance of this into sharp focus.

R. Solomon ibn Adret[49] tried to reconcile medicine and halakah and insisted on their complete compatibility by positing the fallibility of medical diagnosis. He refused to recognize any exceptions to the Talmudic rule of *terefah 'enah hayyah* and therefore argued for complete congruence of halakic prescription and scientific reality. The list of seventy kinds of *terefah* is not only traditional but is also scientifically sound. Maimonides, per contra, by positing the extra-scientific character of this halakah, spares himself the agonizing confrontation and forced harmonization. Maimonides does not invoke the doctrine of the limitations of human knowledge (see *Guide* I, 31) nor does he discredit medicine; he merely posits that it is not relevant in this context.

I would summarize it as follows. The medicine-magic complex, which is multi-dimensional, has an interpretive infrastructure and that provides flexibility. The invitation, indeed the need, to interpret unifies all those related issues.

Now, when interpretation was relevant, even with regard to *terefah*, Maimonides was not timid or apologetic. Note the following. *Hilkot Shehitah*[50] contains a provocative halakic formulation: "removal of the upper jaw" (*leḥi 'elyon*) is mentioned as an incidence of *terefah*. When asked by the Lunel scholars about this unprecedented and, consequently, challenging formulation – the Talmudic list, which is presumed to be complete, does not contain this distinction and hence does not mention this case of *terefah* ("removal of the upper jaw") – Maimonides confidently replied that originality of interpretation was a fact of scholarly life. An author particularly attuned to certain problems may discern a nuance or *novum* in well-known texts which his predecessors had missed completely. Much depends on the author's perception of the material as well as his halakic-conceptual mass of apperceptions, in the light of which traditional texts are made to yield their meaning. An apparent addition may be merely a compelling interpretation or deduction. He defends his formulation as an unimpeachable inference supported by scientific reasoning. His answer to the Lunel rabbis is that he merely interpreted the Talmudic texts and reached a different conclusion. He was not changing the halakah because of scientific data he could bring to bear, but eliciting an intended even if hitherto unnoticed conclusion. To be sure, science could be a guiding principle in interpretation but it was not empowered to alter the list of *terefah*. Maimonides seems to be zealous to preserve the universality and immutability of halakah, just as more generally he emphasizes the permanence and stability of religion.[51]

C. We may turn our attention to an analogous halakah which substantiates this conclusion. A complicated law concerning vows of Naziriteship includes the following:[52]

> If several persons, while walking along the road, see a *koy* in the distance and disagree about it, in this wise: A says, 'I undertake to become a Nazirite if that is a beast of chase'; B says, 'I undertake to become a Nazirite if that is a domestic animal'; C says, I undertake to become a Nazirite if that is not a beast of chase'; D says, 'I undertake to become a Nazirite if that is not a domestic animal'; E says, 'I undertake to become a Nazirite if that is neither a beast of chase nor a domestic animal'; F says, 'I undertake to become a Nazirite if that is both a domestic animal and a beast of chase' all of them become Nazirites. For the koy resembles a beast of chase in some respects, and a domestic animal in others. In some respects, it resembles both beasts of chase and domestic animals, and in others neither. The same would hold if they saw a hermaphrodite and fell to disputing whether he was a man or a woman, all of them vowing in the same way they did about the koy they would all become Nazirites. For the hermaphrodite resembles a man in some respects and a woman in others. In some respects, he resembles neither a man or woman, and in others he resembles both.
>
> All these resemblances refer to Scriptural commandments and not to the object's nature or heredity (*beṭṭiv'o vetoladeto*)

Halakic reality is autonomous *vis-á-vis* scientific status. The nature, anatomy or genetic structure of the androgynous being are one thing; the reality which governs halakic procedures is another.

A statement of Maimonides in his Commentary on the Mishnah, dealing with the formula giving the circumference and area of a circle, may also illumine this approach; the halakic calculation is not contingent upon the scientific query.

> You should know the ratio of the diameter of a circle to its circumference is not known, that is, it is impossible to express it exactly. This is not a lack of knowledge on our part, as the uneducated think, but this thing is intrinsically unknowable (*mizad tiv'o bilti nodah*) and cannot be known. However, it is possible to approximate it closely, and the expert geometers have written works on this subject, that is to approximate the ratio of the diameter to its circumference, and various proofs of the approximations. The approximation that the scientists use is that of the ratio of one to three and one-seventh ... Since this [ratio of circumference to diameter] took the round figure and said that all that have a circumference of three handbreaths have a diameter of one handbreadth. They were satisfied with this [approximation] in all the measurements that they needed throughout the Torah.[53]

IV

The next point, which we shall treat in compressed form, is to underscore the parallelism between Maimonides' attitude to rationalism and his attitude to

science. Just as his acceptance of the permanence and stability of the universe, and of the living species it contains,[54] as a cardinal philosophic principle or fundamental postulate did not eliminate the miracles – they are, as is generally known, restricted, some are based on the immanent natural order (i.e. included in the original order of the universe) and, above all, are not seen as permanent changes in nature[55] – similarly, and this may serve as a mirror of or paradigm for the entire theme, the central role assigned to science in halakah does not eliminate miracles. Maimonides' statement on leprosy establishes this clearly.

> Leprosy is a comprehensive term (i.e. a homonym or amphibolous term) covering sundry incompatible matters. Thus, whiteness in a man's skin is called leprosy; the falling off of some of his hair on the head or the chin is called leprosy; and a change of color in garments or in houses is called leprosy.
>
> Now this change in garments and in houses which Scripture includes under the general term leprosy was no normal happenings (*minhago shel 'olam*) but was a portent and a wonder (*'ot u-feleh*) among the Israelites to warn them against slanderous speaking.[56]

The contrapuntal use of *minhago shel 'olam* and *'ot u-feleh* is precise and expressive.[57] If this phenomenon (leprosy of garments and houses) were presented or perceived as *minhago shel 'olam*, it would be problematic and demand harmonization; however, inasmuch as it is unmistakably labeled as *'ot u-feleh*, the need for allegory or reductionism is obviated. Whereas Philo says that leprosy is to be interpreted allegorically[58] and R. Judah Halevi says that the sages had profound knowledge of leprosy which surpasses our understanding,[59] Maimonides suggests that leprosy does not need to be explained away, does not need to be allied with scientific categories, nor should it be denied by omission or reformulation. It is a miraculous phenomenon – Maimonides mentions in *Guide* III, 47 "This is a miracle that was perpetuated in the religious community like that of the waters of the woman suspected of adultery" – and is unapologetically recognized for what it is; it is philosophically and halakicly viable.[60]

We should interject here that this point is most important historically, for the prolonged and heated debate which crystallized in Jewish thought in the wake of Maimonidean philosophy centered on the question of the natural versus supernatural. Would Aristotelian naturalism reign supreme and displace the supernaturalism which undergirds traditional religion? Would the philosophic tendency to recognize fixed principles and laws of nature that could be analyzed and understood result in a complete desacralization of nature? Maimonides, in fact, did *not* eliminate the supernatural but his critics thought that he did not give it ample recognition, that he let it be overshadowed and drastically reduced its importance. Already R. Judah Alfakar, and he would be followed by Nahmanides, Rashbah, R. Joseph ibn Shushan and a host of others, sounded this refrain: "His intention was [to explain the Bible such] that

the laws of nature not be abrogated, so that the Torah might be at one with Greek philosophy."[61] What was a distinct virtue for Maimonides was a serious shortcoming for the Spanish anti-Aristotelians.

Maimonides' doctrine of providence also illustrates the essential difference between science and scientism. In many contexts Maimonides repeats that divine providence transcends the law of nature. Its influence is not bound by natural causality.

One clear example of this is the Maimonidean critique of Sabianism. In the *Guide* and elsewhere, Maimonides painstakingly reproduces the Sabian denial of natural causality which led them to posit a universe governed by myth:

> When you consider these ancient and unhealthy opinions, it will become clear to you that among all men it was an accepted view that through the worship of stars the earth becomes populated and the soil fertile. Their men of knowledge, as well as the ascetics and the men of piety among them, preached this to the people and taught them that agriculture, on which the existence of man depends, can only be perfected and succeed according to which if you worship the sun and the stars; if you anger them through disobedience, the land will become barren and devastated ... Inasmuch as these opinions were generally accepted, (the idolaters) connected idolatry with agriculture, the latter being necessary for the subsistence of man and of most animals. Accordingly, the priests of idolatry preached to the people during their assemblies in the temples and fortified in their minds the notion that through practice of this cult, rains would fall, the trees would bear fruit, and the land would become fertile and populous.

The conclusion pointedly contrasts Sabian mythology with Biblical belief.

> Now inasmuch as these notions were generally accepted so that they were regarded as certain, and as God, may He be exalted, wished in His pity for us to efface this error from our minds and to take away fatigue from our bodies through the abolition of these tiring and useless practices and to give us Laws through their instrumentality of Moses our Teacher, the latter informed us in His name, may He be exalted, that if the stars and the planets were worshiped, their worship would be a cause for the rain ceasing to fall, for the land being devastated and producing nothing, for the fruit of the trees falling off, for misfortunes attending circumstances, for infirmities befalling the bodies, and for a shortening of lives. These are the intentions of the words of the covenant, which the Lord made. You will find that this intention is reiterated in the whole of the Torah: I mean that it is a necessary consequence of the worship of the stars that rains will cease to fall, that the land will be devastated, that circumstances will become bad, that the bodies will suffer from diseases, and that lives will be short; whereas a necessary consequence of the abandonment of their worship and the adoption of the worship of God will be rainfall, the fertility of the land, good circumstances, health of the body, and length of life. This is the contrary of what was

> preached by the idolaters to the people in order that they worship idols. For the foundation of the Law consists in putting an end to this opinion and effacing its traces, as we have explained.[62]

The alternative to this pagan mythology is not the scientific postulate that good crops depend on rainfall and related climatic phenomena but that true belief and proper worship of God will ward off adversity. Idolatry is in no way related to agriculture, but God may work through nature and above nature.

This is also the rationale which Maimonides finds in the institution of fasting. His morphology of fasting relates it to the experience of prayer while the teleology of fasting is repentance. The entire conceptualization reflects the essential theory concerning the relation between nature and providence.

> This procedure is one of the roads to repentence, for as the community cries out in prayer and sounds in alarm when overtaken by trouble, everyone is bound to realize that evil has come upon him as a consequence of his own evil deeds, as it is written, 'Your iniquities have turned away these things, and your sins have withheld good from you' (Jer. 5:25), and this his repentence will cause the trouble to be removed.
>
> If, on the other hand, the people do not cry out in prayer and do not sound an alarm, but merely say that it is the way of the world for such a thing to happen to them, and that their trouble is a matter of pure chance, they have chosen a cruel path which will cause them to persevere in their evil deeds and thus bring additional troubles upon them. For when the Scriptures says, 'But walk contrary to Me; then I will walk contrary to you in fury' (Lev. 26:27–28), the meaning is: If, when I bring trouble upon you in order to cause you to repent, you say that the trouble is purely accidental, then I will add to your trouble the fury appropriate to such an 'accident.'[63]

V

Professor S. Pines, in a short article entitled "Introduction to Medieval Science," contributed to Professor S. Sambursky's book *Physical Thought from the Presocratics to the Quantum Physicists* (London, 1974), writes:

> While Maimonides has an explicit belief in the correctness of Aristotelian physics as an explanation of the phenomena of the sublunar world, he wishes to point out that Aristotle's views concerning celestial physics are subject to doubt. Like Kant, he is interested in showing that some of the so-called verities and certainties of science are unfounded; as a consequence room can be left for faith.[64]

For our purposes we may simply say that our study of halakah and science suggests the following: as a consequence room can be left for non-scientific or extra-scientific phenomena the credibility of which rests on that additional source of knowledge, namely tradition.

NOTES

[1] Copyright Twersky. The following is the text of a lecture delivered at a Boston University colloquium on "Maimonides and the Sciences," April 1987; only the most essential footnotes have been added. An expanded Hebrew version, fully annotated, appears in the *Shenaton ha-Mishpat ha-Ivri*, v. XV.

[2] "Letter on Astrology," in I. Twersky, ed., *A Maimonides Reader*, p. 464. Hebrew text edited by A. Marx, HUCA III (1926) 350. Note that this is a three-fold formulation in which immediate and derivative scientific knowledge are combined and treated as one category. See the antecedent classification in R. Saadya Gaon, *'Emunot ve-De'ot*, introduction; VII, 2. Also, M. Zucker, Perushe Rasag li-Bereshit, p. 13, n. 9. See H.A. Wolfson, *Studies in the History of Philosophy and Religion*, v. I, p. 593. A representative later classification is found in R. Menahem ha-Meiri, *Perush Tehillim*, psalm 123.

[3] "Letter on Astrology," p. 465.

[4] *Ibid.*: "The great sickness and the 'grievous evil' (Eccles, 5:12, 15) consist in this: that all the things that man finds written in books are old." See also his "Epistle to Yemen" in *A Maimonides Reader*, p. 454: "Do not consider a statement true because you find it in a book, for the prevaricator is as little restrained with his pen as with his tongue. For the untutored and uninstructed are convinced of the veracity of a statement by the mere fact that it is written; nevertheless its accuracy must be demonstrated in another manner."

[5] H.A. Wolfson, "The Double Faith Theory," JQR XXXIII (1942) 222 and see 239. Note also in this connection Guide II, 33: knowledge of God is obtainable by demonstrative reasoning or by direct revelation.

[6] *Guide*, I, 71.

[7] See *Guide*, I, 5; II, 23.

[8] See my *Introduction to the Code of Maimonides*, pp. 365–367.

[9] E.g. *Hilkot Yesode ha-Torah*, II, 1, 2; *Teshuvah*, X, 6. Non-Maimonideans repudiate this by affirming that the Torah is far superior to natural science as a source of the knowledge of God. See, e.g. B. Septimus in I. Twersky, ed., *R. Moses Nahmanides*, p. 23, n. 42.

[10] See the comment on Rabad, *Hilkot Kiddush ha-Ḥodesh*, VII, 7.

[11] S. Gandz, *Studies in Hebrew Astronomy and Mathematics*, ed. S. Sternberg, pp. 113ff.

[12] *Kiddush ha-Ḥodesh*, XIX, 13.

[13] *Guide*, I, 71.

[14] *Op. cit.*, II, 9.

[15] *Op. cit.*, II, 24.

[16] "Letter on Astrology," pp. 465–466.

[17] *Iggerot ha-Rambam*, ed. D. Baneth, pp. 69–70. In an adjacent passage, Maimonides describes his hectic schedule; he complains that he has no time other than on the Sabbath, to study Torah and has no time whatsoever for the other sciences.

[18] S. Pines, Translator's Introduction, *Guide of the Perplexed*, p. cxxxii. See F. Rosner, *Sex Ethics in the Writings of Moses Maimonides* (New York, 1974), p. 4:

> Maimonides must have been an avid reader, since his medical writings show a profound knowledge of Greek and Moslem medical works. Hippocrates Galen and Aristotle were his Greek medical inspiration and Rhazes of Persia, Alfarabi of Turkey, Ibn Zuho and Avenzoar are Moslem authors frequently quoted by Maimonides.

[19] See Y. Tzvi Langerman

[20] *Guide*, II, 24.

[21] *Guide*, Dedicatory Epistle.

[22] See, e.g. my *Introduction*, p. 366, n. 28.

[23] *Kovez Teshuvot ha-Rambam*, I, 25b.

[24] See above, n. 1.

[25] *Ma'amar Teḥiyyat ha-Metim*, ed. J. Finkle, p. 4. Even in *Sefer ha-Mizvot*, negative commandment 179, Maimonides says that only the vulgus without knowledge of natural sciences will marvel at his statement.

[26] L. Strauss, "Notes on Maimonides' Book of Knowledge," *Studies in Mysticism and Religion Presented to G. Scholem*, p. 269.

[27] R. Moses Nahmanides, *Torat ha-Shem Temimah*, in H. Chavel, ed., Kitve ha-Rambam, v. I, p. 154.

[28] *Ma'amar Teḥiyyat ha-Metim*, p. 22.

[29] *Teshuvot ha-Rambam*, n. 252 (p. 460). See Commentary on Mishnah, *Kelim*, II, 1.

[30] When he is apparently scornful of "mere doctors" (e.g. Isaac Isaeli or Razi), it is because they were not at the same time philosophers and were nevertheless dabbling in philosophy.

[31] *Hilkot De'ot*, IV, 20, 21.

[32] See especially the medical tract published in *Transactions of American Philosophical Society* 54 (1964), p. 40. Revealed religion commands that which is useful in the world-to-come while the physician informs his patient concerning that which is useful to the body in this world.

[33] See especially Commentary on the Mishnah, *Pesaḥim*, IV, 10; *Guide*, III, 37. Just as idolatrous practices are religiously useless, so they are also medically useless.

[34] *Hilkot Avel*, IV, 5 and Radbaz, *ad loc.*

[35] See S. Pines, *Collected Works*, v. II, p. 329; also, *ibid.*, p. 191 and 361. R. McKeon, "The Empiricist and Experimentalist Temper in the Middle Ages," *Essays in Honor of John Dewey* (New York, 1929), pp. 216–234. See L. Demaitre in *Speculum* 63 (1988) 118. Galenism meant "medicine was to be taught from a philosophical basis, with reason governing theory and guiding practice; the regula rationis distinguished it as an art ..."

[36] Commentary on the Mishnah, *Yoma*, VIII, 4; see *Hilkot Shabbat*, XIX, 13. Rabbi Solomon ibn Adret, *Teshubot*, 414, contends that Maimonides' position is inconsistent and untenable.

[37] *Hilkot 'Akum*, XI:12; for the coupling of "Scroll or phylacteries," see *Hilkot Shevu 'ot*, XI:11. This entire halakah should be correlated with *Hilkot Mezuzah*, V:4.

> It is a universal custom to write the word *Shad-dai* (Almighty) on the other side of the *mezuzah*, opposite the blank space between the two sections. As this word is written on the outside, the practice is unobjectionable. They, however, who write names of angels, holy names, a Biblical text, or inscriptions usual on seals within the *mezuzah*, are among those who have no portion in the world to come. For these fools not only fail to fulfill the commandment but they treat an important precept that expresses the Unity of God, the love of Him, and His worship, as if it were an amulet to promote their own personal interests; for, according to their foolish minds, the *mezuzah* is something that will secure for them advantage in the vanities of the world.

[38] See my *Introduction*, pp. 418ff.

[39] This is completely congruent with what Maimonides says in his medical treatises, see, e.g. above, n. 31. The teleology is all-important in understanding the differences between religion and medicine. The Torah, while not intending "its words to cure the body," is concerned with the well-being of the body (note in this context *Guide*, III, 27); it delegated the means to the science of medicine. To put it differently, the Torah allows for its suspension in order to prolong life, but the teleology of life in turn is completely subordinate to the Torah.

[40] See R. Abraham Karelitz, *'Inyene Emunah u-Bittahon*, ch. v.

[41] See *Kitve Ramban*, I, p. 380.

[42] *Hilkot Avadim*, I, 5.

[43] See *Teshuvot Ḥakam Zevi*, 18. (The Talmud does, of course, refer to *tiv'ah*.) See, generally, W.J. Courtenay, *Covenant and Causality in Medieval Thought* (esp. ch. III, "Nature and the Natural in Twelfth-Century Thought"). J.A. Weisheipl, "Aristotle's Concept of Nature: Avicenna and Aquinas," in L.D. Roberts, ed., *Approaches to Nature in the Middle Ages*.

[44] See *Hilkot Roze'ah*, I, 9. Birth changes the role of the embryo. The fetus no longer poses a threat to the mother; that one of two people may die is within the realm of nature (*tiv'o shel 'olam*). Note also *Teshuvah*, VI, 5; *Hilkot Avel*, XIII, 11, and *Ta'aniyot*, I, 3; Commentary on Mishnah, *Niddah*, III, 2.

[45] As we shall soon see, there is a symmetry in the attitudes to and attempted changes of nature; physical nature may be changed temporarily by divine miraculous acts whereas human nature may be disciplined and directed by divine laws. For other examples of psychological explanation, see also *Hilkot Shabbat*, X, 10; *'Issure Bi'ah*, I, 9; *Gerushin*, II, 20; *Sanhedrin*, XVIII, 6; Commentary on Mishnah, *Shabbat*, II, 5, *Sanhedrin*, VI, 1, 2; *Guide*, III, 46.

[46] *Hilkot Shevu'ot*, V, 22. We may surmise that this halakah becomes elitist inasmuch as knowledge of the relevant facts depends on general scientific sources (see *Hilkot Yesode ha-Torah*, III, 6; *Kiddush ha-Ḥodesh*, XVII, 25). Only one sensitive to the importance of science will seek to acquire such knowledge. See also Commentary on the Mishnah, *Introduction*, p. 37: Ptolemy's *Almagest* is the source of this information.

[47] *Hilkot Sheḥiṭah*, X, 12–13.

[48] *Hilkot Roze'ah*, II, 8. See *Min ḥat Ḥinnuk* on *Sefer ha-Ḥinnuk*, mizvah 34.

[49] *Teshuvot*, I, n. 98. See also R. Isaac b. Sheshet, *Teshuvot*, n. 45. There is a very interesting discussion in the work of a great-grandson of the Hatam Sofer: R. Moshe S. Glazner, *Dor Revi'i*, introduction p. 4. Rashbah, he says, wants to "deny reality."

[50] *Sheḥiṭah*, VIII, 16, 23 and X, 9, *Teshuvot*, n. 315 (p. 585).

[51] *Guide*, III, 34: "governance of the law ought to be absolute and universal."

[52] *Hilkot Nazir*, II, 10, 11.
[53] Commentary on the Mishnah, *'Eruvin*, I, 5. See S. Sternberg's introduction to S. Gandz, *Studies*, p. xxxiii. As S. Sternberg put it: "Maimonides explains that since it is an irrational number, we have to be satisfied with some approximation. The acceptable degree of approximation then becomes a legal matter." In other words, the halakah creates a reality which may differ from purely scientific reality; in any event, the halakah is not stumped by a scientific impasse.
[54] See S. Pines, *Collected Works*, p. 189.
[55] It was this cautious, restrictive approach to miracles which irked R. Moses Nahmanides.
[56] *Hilkot Ṭume'at Zara'at*, XVI, 10.
[57] See, e.g. *Hilkot Roze'ah*, VI, 12.
[58] See H.A. Wolfson, *Philo*, I, p. 137.
[59] Judah Halevi, *Cuzari*, IV, 31.
[60] The formulation in Ṭume'at Ẓaraœat, XVI, 10 is fully congruent with Commentary on the Mishnah, *Neg'aim*, XII, 5 and *Guide*, III, 47. Note that in *Ṭume'* at *Ẓaraœat*, X, 7 the isolation of the leper is not because "leprosy is contagious and that almost by nature all men find it disgusting," but is rather a punishment which makes the repetition of slander impossible.
[61] See the lucid comments of B. Septimus, *Hispano-Jewish Culture in Transition*, p. 91.
[62] Guide, III, 30. Guide, III, 51, suggests that providence protects one from evil; the lack or absence of providence leaves one exposed to the impartial law of nature. Note also that in the "Letter on Astrology" Maimonides emphasizes the total lack of utility in mythological-astrological belief; true belief is naturally linked to usefulness (*to'elet*).
[63] *Hilkot Taœaniyot*, I, 2, 3.
[64] S. Pines, *Collected Works*, p. 355.

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