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## **NEWTON, MAIMONIDES, AND ESOTERIC KNOWLEDGE**

Maimonides was the most successful thinker to emerge from the Jewish Golden Age. In particular, he promoted the idea that there is total harmony between Scripture and natural science. Each, he believed, has two distinct levels of study and comprehension: an exoteric level accessible to all, and an esoteric level accessible only to the elite. Scholars have overlooked the fact that Maimonides also distinguished between the obvious aspects of scientific knowledge, such as medicine and geometry, which are accessible to all, and the esoteric aspects of physical science, which are beyond the intellectual scope of the vulgar.[ [1](#)] Concerning the esoteric aspects of physical science, Maimonides wrote that "it is impossible to expound some of its premises as they really are" (Guide, "Introduction"; page 3: lines 17-18).\* Indeed,

there are things in existence of which there may be apprehended a single aspect, while [all] other aspects remain unknown. It does not necessarily follow that since [a thing] could be perceived it could be known in its totality. (I, 31; 44:1-2).

Therefore it is necessary to speak about these subjects in "metaphors and fiddles" ("Introduction"; 4:18-19; 26-28). Maimonides identifies the esoteric aspect of science with what the Rabbis designate as *ma ase bereshit*, "the procedure of Creation" ("Introduction"; 3:8; 5:7-8).<sup>2</sup> The esoteric knowledge of physical science is conducive to, but it is not identical with, the ultimate knowledge of the divine, designated by the Rabbis as *ma ase merkaba* "the procedure of the Chariot," (III, 51; 455:28; 456:5). The esoteric aspects of physical science were encoded by the Prophets and the Rabbis in metaphors and fiddles (Guide, "Introduction"; 3:18-23).

On the one hand, since the esoteric aspects of the Tora require intense preparation and high sophistication, they could be apprehended only by the intellectual and moral elite, not by the vulgar. To expose the *sodot*, "secrets" ("Introduction"; 2:16-29) and *sitre tora*, "enigmas of the Tora" ("Introduction"; 5:16-17) found in Prophetic and Rabbinic literature, (I, 35; 54:20-28) to the unlearned would be as harmful as feeding a baby "wheat-bread, meat, and wine" (I, 33; 48:1-9).[ [3](#)] On the other hand, the Tora was designed for all, including the uneducated. The style of the Tora is a direct function of the strategy designed to resolve this dilemma. At the exoteric level, the Tora addresses these matters according to the understanding of the vulgar, while at the same time communicating the esoteric sense to the elite through riddles and metaphors (I, 33; 48: 9-12). The Tora encodes these secrets and enigmas in cryptograms and fiddles, which only the elite can decode. These cryptograms and riddles are formulated in an equivocal language that the vulgar would understand in an innocuous way, but the elite would interpret esoterically ("Introduction"; 5:15-18).

### **The Spread of Rabbinic Thought**

The impact of Rabbinic thought in general and that of Maimonides in particular on the shaping of modern Europe is yet to be investigated. As a result of the dispersion of Iberian Jews and conversos, Rabbinic doctrines and literature were disseminated throughout

Europe. An important source for the spread of Jewish ideas was the study of Jewish culture and literature by Christian scholars. The seventeenth century knew an unprecedented upsurge of first-rate Christian Hebraists, and the translation of many Jewish classics into Latin. Of momentous importance was the Latin translation of *The Guide for the Perplexed* by the renowned Hebraist Johannes Buxtorf (1599-1664), and its publication in 1629 (and to a lesser extent his translation and publication of the *Kuzari* by Yehuda ha-Levi in 1660). Many of Maimonides' doctrines were especially important to the Christian virtuosi in England who came to believe, like Maimonides, in the harmony of Scripture and science.

An important channel for the dissemination of Jewish thought were those highly educated Jews who maintained intellectual contacts with the Christian intelligentsia and were in a position to participate directly in the shaping of new ideas.[ 4] One such individual was Isaac Abendana (c.1640-c.1710), an accomplished scholar, who arrived in England in 1662. Between the 1663 and 1675, at the urging of Cambridge theologians, he translated the entire Mishna into Latin for the first time? Abendana taught Hebrew at Cambridge from 1663. At the same time he was in contact with the scholarly community in Oxford, where he sold many Hebrew manuscripts and books to the Bodleian Library. He moved to Oxford in 1689 and began to teach Hebrew at Magdalene College.

Newton had entered Cambridge in 1662, the year before Abendana began teaching there. Newton knew Hebrew,[ 6] a language that he learned in his second year at Cambridge, most probably from Abendana. Indeed, a first edition of Abendana's *Of the Polity of the Jews* (1706) was part of Newton's library.[ 7] It must have been Abendana who introduced him to Hebrew literature and Rabbinic thinking, particularly that of Maimonides. From this teacher, Newton must have acquired other keen interests: in the Jewish Calendar--a favorite topic of Abendana;[ 8] the consequence of the Noahides' precepts for universal morality and religion--a subject that would become of paramount importance in Newton's concept of universal religion;[ 9] the concern with Jewish measurements--there is a detailed investigation by Newton of the Jewish cubit? the Jewish doctrine of "Dominion"--a concept that he would eventually incorporate in the *Principia*? and interest in Maimonides' codification of the Jewish cult and artifacts at the Temple[ 12]--long excerpts from the Latin translation of Maimonides' *De Cultu Divino* are found in Newton's own hand. Although only a portion of Newton's original library was saved, several Hebrew Bibles and Hebrew lexicons,[ 13] as well as many works on Jewish subjects were found, showing that his interest on these matters was wide and specialized.[ 14]

Newton's knowledge of Rabbinics was neither casual nor superficial. To illustrate, when expounding the apocalyptic conflict of Gog and Magog, Newton refers to the Targum or Aramaic Version of Esther (2:12), as well as to *Vayigra Rabba*, and the commentaries of Se'adya Gaon and Ibn `Ezra.[ 15] In a discussion of a Rabbinic passage, Newton records the opinion of R. Aharon ha-Levi (thirteenth century), the supposed author of *Sefer ha-Hinnukh*, and his disagreement with Rashi on the matter at hand.' He also refers to the Rabbinic work *Sifra* as well as to the position of R. Aharon ibn Hayyim (born c. 1560), the author of *Qorban Aharon* (Venice, 5369/ 1609).[ 16] Later on, he discusses *Seder Ma'amadot* (the participation of the Israelites in the daily sacrifices) and quotes the opinion of Bertinoro on the Mishna *Yoma* (7:1).[ 17] There are extensive copies in Newton's own hand of passages from the Babylonian and Palestinian Talmud in Latin.[ 18]

Newton's interest in Rabbinics was not purely intellectual. He had absorbed many of the fundamental Rabbinic ideas on religion. One of these was the Rabbinic doctrine concerning the seven precepts that, according to the Rabbis, God had commanded Noah to make known to humanity. These precepts constitute the core of religion, and alone they suffice for salvation (*Theological Manuscripts*, 52; hereafter, TM). The purpose of the Gospel is to have the gentiles return to that primitive religion of Noah (TM, 29). This is the law "which the Apostle tells you was written on the hearts of the Gentiles," and serves as the basis for both Christianity and Judaism (TM, 23). Although the precepts of Noah are not as perfect as the religion of the Scripture, they suffice for salvation. Indeed, (as the Rabbis taught)

Jews had admitted into their gates heathens who accepted Noah's precepts, but had not converted to the Law of Moses (TM, 52-53). The same applies even after the advent of Christianity. Those who practice the precepts of Noah will be saved, although not professing Christianity (TM, 53). Since Newton believed that the precepts of Noah were binding even after the advent of Christianity, he maintained that it is forbidden to eat "the flesh"[ 19] or drink "the blood of animals. For this religion [i.e. Noah's precepts] obliged men to be merciful even to brute beasts."[ 20]

### **Newton and Maimonidean Tradition**

Newton was a profoundly religious man. Scholars familiar with his life know that interest in mathematics and astronomy constituted only a part of--one may say a digression from--his main intellectual activities. His religious thought seems to have permeated his scientific writings. "It is usually considered a blemish on Newton's life," remarked a historian of scientific ideas, "that he spent the last twenty years working on numerology from the Scriptures, and became impatient when people asked him questions about physics."[ 21] David Castillejo has noted the remarkable fact that Newton has used certain symbolism, particularly the numbers three, seven, and ten taken from the Temple of Solomon to structure his *Opticks*. (According to Newton the Temple was built horizontally in units of ten, and vertically in units of three, seven and eight: his *Opticks* consists of seven books arranged into three parts; it opens with eight Definitions, eight Axioms, and eight Propositions--a triple row of eights.) "It is likely," Castillejo wrote, "that this is only the tip of an iceberg revealing the presence of much more complicated meaning, a proportion and intent in his work."[ 22] In fact, most of Newton's intellectual efforts were not in science but in religion, chronology and alchemy. During the most productive period of his life, when he made his famous scientific discoveries, Newton devoted great time and effort to religious, historical and esoteric studies. Referring to the period between Newton's entering Cambridge and the publication of the *Principia* (1661-1687), Lord Keynes wrote:

During these twenty-five years of intense study mathematics and astronomy were only one part, and perhaps not the most absorbing, of his occupations. Our record of these is almost wholly confined to the papers which he kept and put in his box when he left Trinity for London.[ 23]

Newton was particularly influenced by Maimonidean thinking and tradition; many of his views on religion could be directly traced to Maimonides. Lord Keynes, who studied Newton's theological manuscripts more than anyone else, wrote:

Very early in life Newton abandoned orthodox belief in the Trinity .... It may be that Newton fell under Socinian influences, but I think not. He was rather a Judaic monotheist of the school of Maimonides. He arrived at this conclusion, not on so-to-speak rational or sceptical grounds, but entirely on the interpretation of ancient authority. He was persuaded that the revealed documents give no support to the Trinitarian doctrines which were due to late falsification. The revealed God was one God.[ 24]

Newton's interest in Maimonides is well-documented. In addition to four books of Maimonides' Legal Code in Latin, as well as Pococke, *Porta Mosis* (1655) in Hebrew and Latin found in his library,[ 25] there are thousands of words copied by Newton from Maimonides' legal writings in Latin.[ 26] More importantly, there are many parallels between the doctrines of Maimonides and those of Newton. A close reading of the "General Scholium" of the *Principia* will show that Newton systematically rejected Spinoza's concept of the deity for that of Maimonides.

According to Newton, and unlike Spinoza, God is absolutely transcendental with complete Dominion over His creatures. Maimonides postulated that God is "a necessary Being" (I, 57; 90:7; cf. *Mishne Tora*, *Yesode ha-Tora*, I, 1). In the General Scholium, Newton writes that all agree "that the Supreme God exists necessarily," and describes Him as "a Being necessarily existing."<sup>27</sup> Newton clung faithfully to the belief in the scriptural God, who does

not constitute a part of the universe. Like Maimonides, he rejected the notion of a God who is immanent in nature, acting as "the soul" of the world (I, 70; 118:24-25; III, 29; 375:24). "This Being," wrote Newton, "governs all things, not as the soul of the world, but as Lord over all" (Principia, 544; hereafter, Pr). Like Maimonides (I, 51, 53, 55, 57, 60, et al), Newton rejected the attribution of human perceptions or actions to God. God's perceptions and actions are not at all similar to those of humankind:

Whence also he is all similar, all eye, all ear, all brain, all arm, all power to perceive, to understand, and to act; but in a manner not at all human, in a manner not at all corporeal, in a manner utterly unknown to us. As a blind man has no idea of colors, so have we no idea of the manner by which the all-wise God perceives and understands all things.[ 28] He is utterly void of all body and bodily figure, and can therefore neither be seen nor heard nor touched; nor ought he to be worshiped under the representation of any corporeal thing. We have ideas of his attributes, but what the real substance of anything is we know not... much less, then, have we any idea of the substance of God. (Pr, 545-546)

Since God's knowledge and existence are utterly different from ours, Maimonides argued that His existence and knowledge do not interfere with ours. Therefore, although God is omniscient and omnipresent, humankind is totally free.<sup>29</sup> The same point was made by Newton: "God suffers nothing from the motion of bodies; bodies find no resistance from the omnipresence of God" (Pr, 545).

An essential element in Maimonides' theology is that it is impossible to know God directly (I, 57-58; III, 20; 348:20-21), but only indirectly through His acts and creations (I, 34; 50:8-9; cf. 71; 126: 27-28). In the same fashion, Newton maintained, "We know him only by his most wise and excellent contrivances of things, and final causes" (Pr, 546). Newton concurred with Maimonides that although it is impossible to have an immediate knowledge of God, one can draw near Him through understanding.[ 30] Therefore, in the footsteps of the virtuosi, and in full accord with Maimonides, Newton did not see any contradiction between the realm of physics and the scriptural concept of God. For Maimonides, the study of natural science is essential for a fuller perception of God.[ 31] Similarly, Newton wrote that when he developed his Principia, "I had an Eye upon such Principles as might work with considering Men for the Belief of a Deity." [ 32] Maimonides saw in the universe evidence of God's wisdom and providence? Similarly, Newton maintained, "This most beautiful system of the sun, planets, and comets could only proceed from the counsel and dominion of an intelligent and powerful Being." [ 34] Maimonides recognized in anatomical and physiological designs special evidence of God's care and providence (III, 12). A similar idea was expressed by Newton:

Can it be by accident that all birds, beasts, and men have their right side and left side alike shaped (except in their bowels); and just two eyes, and no more, on either side of the face; and just two ears on either side [of] the head; and a nose with two holes; and either two forelegs or two wings or two arms on the shoulders, and two legs on the hips, and no more? Whence arises this uniformity in all their outward shapes but from the counsel and contrivance of an Author?[ 35]

Like Maimonides (III, 19; 346), Newton was particularly impressed with the design of the eye.<sup>36</sup> Projecting the sense of "dominion" (adanut) in the Hebrew term for "God," Adonay,[ 37] rather than the "divine" of the Latin Deus, Newton wrote:

[F]or God is a relative word, and has respect to servants; and Deity is the dominion of God not over His own body, as those imagine who fancy God to be the soul of the world, but over servants. The supreme God is a Being eternal, infinite, absolutely perfect; but a being, however perfect, without dominion, cannot be said to be Lord God; for we say, my God, your God, the God of Israel, the God of Gods, and Lord of Lords; we do not say, my Eternal, your Eternal, the Eternal of Israel; but every Lord is not a God. It is the dominion of a spiritual being which constitutes a God: a true, supreme, or imaginary dominion makes

a true, supreme, or imaginary God. And from his true dominion it follows that the true God is a living, intelligent, and powerful Being; and, from his other perfections, that he is supreme, or most perfect. He is eternal and infinite, omnipotent and omniscient; that is, his duration reaches from eternity to eternity; his presence from infinity to infinity; he governs all things, and knows all things that are or can be done. (Pr, 544-545)

Faith in God's dominion necessitates the belief that He is absolutely free. Like Maimonides, Newton maintained that the laws ruling the universe do not apply to God, the First Cause (I, 56; cf. 35, 69). Therefore, although God had created a perfectly mechanical universe, "the First Cause," Newton insisted, "is certainly not mechanical." [ 38] This means, as Maimonides `had taught, `that God does not act out of necessity, but out of choice and perfect freedom (II, 13; 196:8-9; and 19; 211:17-18). To Newton, too, God appeared as "a voluntary Agent," [ 39] and the uniformity of the planetary system as "the effect of choice." [ 40] This theme was further developed by Roger Cotes (1682-1716), who, in the Preface to the Second Edition of the Principia (1713), attacked those who deny that the world "was caused by the will of God," and attributed it to "some necessity." There is "not the least shadow of necessity" compelling the Creator. "Without all doubt this world," he declared, "could arise from nothing but the perfectly clear free will of God directing and presiding over all."

### **The "Vulgar" and the Esoteric**

For Spinoza, God is not a transcendental being directing the universe from without, but an immanent principle moving everything--according to immutable and perfect laws--from within. Ironically, the mechanical model of the universe developed by Newton better suited Spinoza's conception of an absolutely autonomous universe than his own conception of a universe depending on divine Providence. For if God is the perfect Clockmaker, as Newton's friend Rober Boyle (1627-1691) depicted Him, [ 42] then one would have to admit, as Leibnitz very cleverly argued, that God could no longer have any role in the universe. [ 42] In order to eliminate any possible lingering function or interference from without, Spinoza identifies the Clockmaker with the clock: the creation of a perfect clock necessarily displaces the perfect Clockmaker.

The key to unraveling Newton's mind on this fundamental issue is Maimonides.

With Maimonides, Newton believed that God not only reveals His will at an exoteric level, accessible to all, but, also, at an esoteric level: God encodes His will in riddles and cryptograms accessible to the intellectual elite alone. For Maimonides, not only does the Scripture itself contain such riddles and cryptograms, but also the physical realm. Indeed, Maimonides regarded the esoteric aspect of physical phenomena as one of the "great mysteries" of the universe ("Introduction"; 3:16-24), and he identified the study of ma'ase bereshit of the Rabbis with the esoteric study of physics (I, 33). Thus, there is a mystical and mysterious aspect to the Godhead, not revealed in the laws of nature, but, rather, encoded--in a specific Maimonidean style--in "riddles" and "cryptograms" that He had laid about in the universe, and that the initiate could decode. This is how Lord Keynes described Newton's outlook:

. . . he looked on the whole universe and all that is in it as a riddle, as a secret which could be read by applying pure thought to certain evidence, certain mystic clues which God had laid about the world to allow a sort of philosopher's treasure hunt to esoteric brotherhood. He believed that these clues were to be found partly in evidence of the heavens and in the constitution of elements (and that is what gives the false suggestion of his being an experimental natural philosopher), but also partly in certai papers and traditions handed down by the brethren in an unbroken chain back to the original cryptic revelation in Babylonia. He regarded the universe as a cryptogram set by the Almighty--just as he himself wrapt the discovery of the calculus in a cryptogram when he communicated with Leibniz. By pure thought, by concentration of the mind, the riddle, he believed, would be revealed to the initiate.

He did read the riddle of the heavens. And he believed that by the same powers of his introspective imagination he would read the riddle of the Godhead, the riddle of past and future events divinely foreordained, the riddle of the elements and their constitution from an original undifferentiated first matter, the riddle of health and of immortality.[ [43](#)]

The distinction between two levels of perception--an exoteric one accessible to the masses and an esoteric one reserved for the intellectual elite--is the cornerstone of Maimonides' hermeneutics. Without such a distinction, the harmony between Scripture and natural science is hopeless. Basing himself on the Rabbinic principle that the "Tora expresses itself in the language of man,"<sup>44</sup> Maimonides taught that Scripture described the Deity in anthropomorphic terms, in order to accommodate itself to the ways of humankind (I, 26). Accordingly, these passages must be understood allegorically (Mishne Tora, Yesode ha-Tora I, 9). All the different anthropomorphic attributes applied to God--such as hearing, seeing, speaking, acting, alive, etc.--were designed to accommodate the opinion of the vulgar (I, 46). A similar position was maintained by Newton:

But, by way of allegory, God is said to see, to speak, to laugh, to love, to hate, to desire, to give, to receive, to rejoice, to be angry, to fight, to frame, to work, to build; for all our notions of God are taken from the ways of mankind by a certain similitude, which, though not perfect, has some likeness, however. (Pr, 546).

The same principle applies to the descriptions of creation (ma'ase bereshit). Maimonides explained that since the vulgar could not adequately comprehend the esoteric aspects of physical phenomena (sitre tora), the Scripture had to express itself on this matter in vulgar terms, and encode its true opinion in cryptograms that only the elite could decode (I, 33). Similarly Newton, when asked to reconcile the account of creation with science, asserted that Scripture was "artificially adapted to the sense of the vulgar."[ [45](#)] In his characterization of nature, Moses' purpose was "not to correct the vulgar notions . . . but to adapt a description of the creation as handsomely as he could to the sense and capacity of the vulgar."[ [46](#)] Because Moses was addressing the vulgar, he had to use "figurative expression," such as "windows or floodgates of heaven" that must not be taken literally:

For Moses, accommodating his words to the gross conceptions of the vulgar, describes things much after the manner as one of the vulgar would have been inclined to do had he lived and seen the whole series of what Moses describes.[ [47](#)]

There were many elements pertaining to creation that the vulgar could not grasp, but that could not be omitted. On the one hand, Moses could not have described them as they really were because the vulgar would not understand. On the other hand, he could not have omitted them, as his account of creation would then appear faulty. Considering this specific predicament, Moses' account of creation is indeed remarkable:

Omit them he could not without rendering his description of the creation imperfect in the judgment of the vulgar. To describe them as they were in themselves would have made the narration tedious and confused, amused the vulgar, and become a philosopher more than a prophet. He mentions them, therefore, only so far as the vulgar had a notion of them .... Consider, therefore, whether anyone who understood the process of the creation and designed to accommodate to the vulgar not an ideal or poetical but a true description of it, as succinctly and theologically as Moses has done, without omitting anything material which the vulgar have a notion of or describing any being further than the vulgar have a notion of it, could mend that description which Moses has given us.[ [48](#)]

It seems that Newton regarded the description of the universe in the Principia as accessible to all, and therefore, pertaining to the realm of the exoteric. In fact, he had remarked "that he first proved his inventions by geometry and only made use of experiments to make them intelligible, and to convince the vulgar [*italics added*]."49 The meaning of this statement is

that geometry-- and by implication Spinozan, Cartesian, and scientific methodologies-- pertain to the exoteric. Beyond the world of mechanics and mathematics, however, lay a vast, oceanic realm, which could not be sought in the Principia and Opticks. Not long before his death, Newton said:

I do not know what I may appear to the world; but to myself I seem to have been only like a boy, playing on the seashore, and diverting myself, in now and then finding a smoother pebble or a prettier shell than ordinary, while the great ocean of truth lay all undiscovered before me.[ 50]

Only the chasm between the realm of the exoteric and that of the esoteric could explain how a man of such profound religious feelings as Newton had omitted from the first edition of the Principia and the Opticks (1704) all mention of God, exposing himself to the charge of atheism.[ 51] It seems that Newton understood that at the level of scientific analysis, God's active participation must remain indiscernible. Thus, he concurred with Maimonides that God's presence is fully perceived only by those able to decode the divine cryptograms lying about the realm of the esoteric.

The issue raised by Leibnitz, as to the role of the Clockmaker after creating a perfect clock, could vex only the person negating the vast ocean of truth stretched out beyond the realm of physics and mathematics.

### **Notes**

[1] Moses Maimonides, *The Guide for the Perplexed*, I, 34, p. 52, 11.10-11. All quotations from *The Guide* are from the Arabic text, *Dalalat al-.Ha'irin*, edited with variant readings by Issachar Joel (Jerusalem: J. Junovitch, 5691 [1930/31]); the translations are mine. Subsequent references are given in the text.

[2] See also Jose Faur, *Golden Doves with Silver Dots: Semiotics and Textuality in Rabbinic Tradition* (Bloomington: Indiana University Press, 1986), 36.

[3] For the qualifications of the chosen elite, see *Guide*, "Introduction," p. 2, 11. 14-24; I, 34, p. 52, 1. 6, p. 53, 1. 19.

[4] See Aaron L. Katchen, *Christian Hebraists and Dutch Rabbis* (Cambridge, Mass.: Harvard University Press, 1984).

[5] See Israel Abrahams, "Isaac Abendana's Cambridge Mishna and Oxford Calendars," *Transactions, Jewish Historical Society of England*, 8 (1915-1917), 98-117.

[6] See Louis Trenchard More, *Isaac Newton: A Biography* (New York: Dover Publications, 1962), p. 39. More did not know Hebrew; for a better evaluation, see Gale E. Christianson, *In the Presence of the Creator: Isaac Newton and His Times* (New York: The Free Press, 1984), p. 49. Newton could write Hebrew, see Ms. Yah. 13.2, pp. 5b, 17a-b, 18a, 19a, 22b; Ms. Kaynes 2, p. 17a.

[7] See Richard de Villamil, *Newton: The Man* (Reprint of the 1931 edition, New York: Johnson Reprint Corporation, 1972), p. 63.

[8] de Villamil, 81 (*Jewish Kalendar*), 87 (*Munster, Kalendarium Hebraicum*), 94 (*Rule for Finding Easter, &c*). On Abendana's Jewish Calendars, see Abrahams, 117-121. I would like to call attention to Yay. Ms 22, a work by Newton on the calendar, "Considerations about rectifying the Julian Kalendar." In p. 4 there is a quotation of Maimonides' Qiddush ha-Hodesh on the Jewish calendar, taken from Ludovicus de Compiegne de Veille, *Secunda Lex, Tractatus de Conservazione Calendarum* (Paris, 1669). For Abendana's interest in the calendar see Isaac Abendana, *Discourses of the Ecclesiastical and Civil Polity of the Jews* (London, 1706), pp. 171-198. See also Abrahams, 104-107.

[9] Abendana, 1-3, 42, 129.

[10] Abendana, 1-3, 42, 129. A short tract by Newton, *The Sacred Cubit of the Jews*, was published among the *Collected Works of John Graves* (London, 1738).

[11] Abendana, 126.

[12] Abendana completed a Latin translation of Maimonides' work on *The Vessels of the Temple*; see Abendana's letter published by W. D. Macray, "A letter from Isaac Abendana," *Festschrift zum . . . Moritz Steinschneider* (Leipzig: Otto Harrassowitz, 1896), p. 90; and Israel Abrahams, "Note on Isaac Abendana," *Transactions, Jewish Historical Society of England*, 10 (1921-1923), 221-224.

[13] de Villamil, 67: *Biblia Sacra Hebraica cum Pinctis* [n.d.]; another appears in the "Supplementary List," *ibid.*, 105 (*Bible Hebrew* [no title or date]); Buxtorf, *Lexicon Hebraicum* (1621); "Supplementary List," Robertson, *Lexicon Hebraeum* (1680).

[14] Although the existence of the library was known (see de Villamil, 4), no efforts were made to save it or catalog it.

[15] H. McLachlan, *Sir Isaac Newton Theological Manuscripts* (Liverpool: University Press, 1950), 135. Subsequent references are given in the text.

[16] See Yah. Ms. 13.2, 21b-22a.

[17] Yah Ms. 13.2, 22b. It would be interesting to see whether this note on Bertinoro comes from Abendana's notes on his Latin Translation of the Mishna, now in Cambridge.

[18] See *A Catalogue of the Portsmouth Collection of Books and Papers written by or belonging to Sir Isaac Newton*, prepared by H. R. Leard, G. G. Stokes, G. C. Adams, G. D. Liveing (Cambridge: Cambridge University Press, 1888), p. 29 #2; Yah. Ms. Var. 13.2, 18a-22b. On the Latin translations of the Talmud, see Erich Bischoff, *Kritische Geschichte der Talmud-Ubersetzungen* (Frankfort: J. Kauffmann, 1899).

[19]" *Irenicum*," Keynes Ms. 3, p. 5.

[20] *Theological Manuscripts*, 29. In *A Catalogue of the Portsmouth Collection*, p. 29 #1, there is a paper in Newton's own hand concerning the prohibition against drinking blood.

[21] Giorgio de Santillana, "The Seventeenth-Century Legacy," in his *Reflections on Men and Ideas* (Cambridge, Mass.: The M.I.T. Press, 1968), p. 179.

[22] David Castillejo, "A Report on the Yahuda Collection of Newton MSS," (found in the file on Newton, at the Jewish National and University Library at Jerusalem), 8.

[23]" *Newton, the Man*," in *The Royal Newton Tercentenary Celebrations* (Cambridge: Cambridge University Press, 1947), p. 30.

[24]" *Newton, the Man*," p. 30.

[25] de Villamil, 85, 91.

[26] *A Catalogue of the Portsmouth Collection*, 29 #2; 30 #16; Yah. Ms. 13.2, 1a-18a. Cf. *Theological Manuscripts*, 16. He seems to have used the translation of Ludovicus de Compiègne Veille, *De Cultu Divino* (Paris?); cf. Newton, "The Language of the Prophets," Keynes Ms. 5, chapter 2, pp. 9, 10. On the translations of Maimonides' *Mishne Tora* in Latin,

see Katchen.

[27] *Principia*, p. 546.

[28] For this doctrine, see *Guide III*, 20-21; *Mishne Tora*, *Teshuba V*, 5; cf. *Yesode ha-Tora II*, 10. The example of the blindman unable to imagine colors comes from Maimonides, *Pirush ha-Mishnayot, Sanhedrin*, Chap. 10, Joseph Kafih's ed. (Jerusalem: Mossad Harav Kook, 5725/1965), vol. 4, p. 203.

[29] *Mishne Tora*, *Teshuba V*, 5; *Guide*, *III*, 20, pp. 349, 1. 2-350, 1. 1.

[30] *Newton's Philosophy of Nature*, ed. H. S. Thayer (London: Hafner Press, 1974), p. 156.

[31] *Guide I*, 46; cf. 71, pp. 126-127. This knowledge, however, does not lead to the ultimate knowledge of God, see *III*, 51, p. 456.

[32] Letter I to Richard Bentley, reproduced in I. Bernard Cohen, ed. *Isaac Newton's Papers & Letters On Natural Philosophy* (Cambridge, Mass.: Harvard University Press, 1958), 280.

[33] *Mishne Tora*, *Yesode Ha-Tora*, *II*, 2; *Guide*, *III*, 28, p. 373.

[34] In letter to Bentley, cited above n. 32.

[35] *Memoirs II*, 347-348; cf. *Theological Manuscripts*, 48-49; *Newton's Philosophy of Nature*, 155-156.

[36] *Memoirs II*, 348.

[37] Popular opinion notwithstanding, for Maimonides the duty to believe in God means belief in his dominion. See my *Studies in the Mishne Tora [Heb.]* (Jerusalem: Mossad Harav Kook, 1978), 159.

[38] *Opticks*, p. 334.

[39] Letter I to Richard Bentley, 282.

[40] *Newton's Philosophy of Nature*, 177.

[41] Ian G. Barbour, *Issues in Science and Religion* (New York: Harper and Row, 1966), 40-43.

[42] Edwin Arthur Burtt, *The Metaphysical Foundations of Modern Physical Science* (London: Routledge & Kegan Paul, Ltd. 1949), 288-293; *Science and Religion in Seventeenth-Century England*, 201-203.

[43]" Newton, the Enigma," 29.

[44] *Berakhot* 31b.

[45] *Memoirs*, *II*, 450.

[46] *Memoirs*, *II*, 450.

[47] *Memoirs*, *II*, 453.

[48] *Memoirs*, *II*, 452-453.

[49] Quoted in *Isaac Newton: A Biography*, 610.

[50] Quoted in Andrade, "Newton," 18.

[51] E. W. Strong, "Newton and God," *Journal of the History of Ideas*, 13 (1952), 148150.

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