

# SCIENTIFIC PERSPECTIVES ON PSALM 148 IN LATE MEDIEVAL JEWISH EXEGESIS\*

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## *Abstract*

Psalm 148 is a hymn inviting all beings in the celestial world and the earthly world to praise God. Even though the Psalm seems simple and easy to understand, two questions have been raised in the history of the exegesis of this Psalm: why are these specific creatures and not others mentioned in the Psalm, and why are they placed in this particular order? In Ancient Judaism, little attention was given to the explanation of this Psalm from a scientific perspective. Abraham ibn Ezra seems to be the first Jewish exegete to have written a systematic commentary on Psalm 148 to demonstrate that the biblical text describes the structure, composition and laws of the universe according to Aristotelian principles. Ibn Ezra's scientific comments on this Psalm were the starting point for future scientific analyses by later exegetes in southern France, such as David Qimhi and Menahem ha-Meiri. The latter interpreted this Psalm in the light of Aristotelian cosmology, and, more specifically, in consonance with scientific ideas set forth in Aristotle's *Meteorology*. It is the purpose of this article to analyze how Psalm 148 was interpreted by these three Jewish exegetes from a scientific perspective, and to examine how later exegetes explained, developed or even refuted the scientific interpretations of their predecessors. It also examines the sources that Ibn Ezra may have used to learn about Aristotle's ideas.

## *Key Words*

Bible exegesis, medieval science, Aristotle, astronomy, philosophy.



## *I. Introduction*

Psalm 148 is a hymn inviting all beings in the celestial world and the earthly world to praise God. The Psalm is normally divided into two parts. In the first part (verses 1–6), the psalmist addresses different beings in the celestial world, such as the angels, the heavenly hosts, and the sun and the moon. In the second

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\* This research is part of the project *Science and Religion in Medieval Judaism* (PID2020–118688GB–I00) financed by the Ministerio de Ciencia e Innovación of the Government of Spain.

part (verses 7–14), he addresses different beings in the earthly world, such as the sea monsters and the ocean depths, and atmospheric phenomena, such as fire, hail, snow and smoke. The closing verses of the Psalm are a historical reflection on the relationship between God and the people of Israel. Verse 14 also includes an allusion to the eventual return of the people of Israel to their homeland after exile.

In Ancient Judaism, little attention was given to the explanation of Psalm 148 from a scientific perspective. Abraham ibn Ezra seems to have been the first exegete to make extensive use of the scientific theories of Aristotle in his exegesis of this Psalm.<sup>1</sup> In the thirteenth century, in the context of the reception of Aristotelianism in southern France, David Qimhi<sup>2</sup> and Menahem ha-Meiri<sup>3</sup> interpreted it in the light of Aristotelian cosmology, and, more specifically, in consonance with scientific ideas set forth in Aristotle's *Meteorology*.

It is the purpose of this article to analyze the history of the exegesis of Psalm 148, in order to prove that Abraham ibn Ezra was the starting point of the scientific interpretation of this Psalm, and that his interpretation was later decisive for the comments of David Qimhi and Menahem ha-Meiri on the same Psalm. It also examines the sources from which Ibn Ezra may have drawn these Aristotelian cosmological concepts,<sup>4</sup> and analyzes how David Qimhi and Menahem ha-Meiri reinterpreted the commentaries of their predecessors by explaining, developing or even refuting their scientific explanations. This analysis will likewise show how these exegetes adapted their exegetical methodologies to the needs of their scientific purposes, in addition to shedding

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<sup>1</sup> Abraham ibn Ezra (1089–1164) was a biblical exegete, poet, grammarian, translator, philosopher, astronomer and astrologer. Around 1140, at the age of 50, he left al-Andalus and travelled through Italy, France and England for the rest of his life. In his biblical commentaries, he used his knowledge of Hebrew grammar, philosophy and the sciences to interpret the biblical text.

<sup>2</sup> David Qimhi (1160–1235) was a grammarian and exegete from Narbonne, Provence. In his biblical commentaries he frequently used philosophy and scientific literature to interpret the text. He was influenced by the rational approach to the Bible of Ibn Ezra and Maimonides. Some of his commentaries also contain a considerable amount of polemics.

<sup>3</sup> Menahem ha-Meiri (1249–1315), born in Perpignan, Provence, where he spent his entire life, was a commentator of the Bible and the Talmud. Of his biblical commentaries, only those on Psalms and Proverbs have been preserved. In his biblical exegesis, Meiri followed the Maimonidean philosophical tradition, and frequently adopted a scientific point of view. Some of his comments also reflect the situation of the Jews in exile during his own times.

<sup>4</sup> With the terms 'Aristotelian' and 'Aristotelianism', I am referring to the medieval corpus of ideas in which truly Aristotelian notions are combined with Neoplatonic doctrines; on the use of these terms in this sense, see COLETTE SIRAT, *A History of Jewish Philosophy in the Middle Ages*, Cambridge University Press-Éditions de la Maison des sciences de l'homme, Cambridge-Paris 1993, p. 141.

light on how Ibn Ezra's exegesis was received by the Jewish exegetes of southern France and how Aristotle's *Meteorology* was transmitted in the exegetical context.

## II. Exegesis of Psalm 148 Prior to Abraham ibn Ezra

In order to determine when the scientific exegesis of Psalm 148 began, I will first briefly analyze the most important commentaries on this Psalm written before Ibn Ezra.

No comprehensive interpretation of Psalm 148 is found in the Babylonian Talmud. Only some expressions such as *stars of light* or *all His hosts* (Psalm 148:3) are occasionally explained to refer to the heavenly beings (*BPesahim* 2a).<sup>5</sup> In *BHagigah* 12b, the expression *stormy wind* (Psalm 148:8) is taken to mean « the wind of the storm », as proof that « the storm makes the wind its substance ».

The two pairs *fire and hail, snow and smoke* (Psalm 148:8) are quoted to prove that these natural phenomena are connected not to the heavens but to the earth, on which they are to be found (*BHagigah* 12b).

In *BHullin* 139b, there is a controversy on the expression *šippor kanaf* (*winged birds*) (Psalm 148:10). Some consider that *šippor* includes both clean and unclean birds, and that *kanaf* includes locusts. According to others, *šippor* refers only to clean birds and *kanaf* to both unclean birds and locusts.

In *Midrash Tehillim*, Psalm 148 is interpreted in the sense that God created the heavens and the earth and all their creatures on the condition that they sing the praises of God. The midrash stresses the idea that, just as there are many creatures on earth, so too are there many creatures in heaven, and all of them are encouraged to praise the Lord.<sup>6</sup>

*The sun and the moon* (Psalm 148:3) are interpreted allegorically to mean the Patriarchs and the Matriarchs, and *the stars of light* are taken as referring to the righteous men. The author of the midrash deduces that « every righteous man has his own star in heaven, and that his star shines according to his deeds ».

The expression *heaven of heavens* (Psalm 148:4) proves that there are at least three heavens. The expression *waters that are above the heavens* (Psalm 148:4) refers to the waters of Creation, because the word *šamayim* is equivalent to *ša' mayim* « laden with water ». The expression *for he commanded and they were created* (Psalm 148:5) is taken to mean that it was not a hard task for God to create heaven and earth, for he simply commanded them and they formed by themselves.

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<sup>5</sup> For the English translation of the Hebrew text of Psalm 148, I have mainly followed the *New Revised Standard Version*, Oxford University Press, New York–Oxford 1989, p. 645–646.

<sup>6</sup> *The Midrash on Psalms*, ed. and trans. WILLIAM G. BRAUDE, Yale University Press, New Haven 1959, vol. II, p. 375–377.

The question of why the sea monsters are mentioned first among the earthly creatures (Psalm 148:7) is posed by the author of this midrash: the reason is that they are larger than the rest of earthly beings. The mention of the *kings of the earth* is followed by *all peoples, princes and judges* because the first to praise the king are the people of the palace, and then the people of the city.

Rashi's commentary on Psalm 148, which comprises only a few lines, follows mainly the Talmud and adds little to it.<sup>7</sup> Following the Talmud, he explains that the expression *stars of light* (Psalm 148:3) means « stars of night ». The *order or law* mentioned in verse 6 is interpreted as a reference to the sun and the moon, and the boundary that was placed by God between them so that the sun shines during the day and the moon during the night.

However, Rashi provides an explanation on why *fire and hail, snow and smoke* are connected to the earth and not to the heavens, as observed in *BHagigah* 12b. Following the Talmud, Rashi explains that הדברים הללו היו תחילתם גנוזים בשמים ובה דוד והורידן לארץ, לפי שהם מיני פורעניות ואין נאה להם להיות גנוזים במגוריו של הקדוש ברוך הוא « these things were originally hidden away in heaven, but David came along and brought them down to earth, because they were various kinds of punishments, and it was not seemly that they should be found in the dwelling place of the Holy One Blessed be He ».<sup>8</sup> However, Rashi's commentary contains no explanations as to why these specific beings are mentioned in the psalm and in this order.

According to Saadiah Gaon (928–942), three ideas can be derived from this psalm: 1) the psalmist calls on the minerals and many of the animals to praise God, even though they are unable to speak; they are mentioned in the psalm in addition to the angels and humans in order to show God's power and force in both worlds: the heavenly world and the earthly world; 2) God's command to all the existent beings is to praise Him; and 3) when human beings observe the world and come to the conclusion that it has a Creator, they feel obliged to praise Him.<sup>9</sup>

In Karaite exegesis, the Book of Psalms was considered a book of prophetic prayers to be used for all time.<sup>10</sup> It was precisely the biblical text of Psalms that fashioned Karaite liturgy. In consequence, Karaite authors wrote extensive commentaries on Psalms for liturgical reasons.<sup>11</sup>

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<sup>7</sup> RASHI, *Commentary on Psalms*, ed. and trans. MAYER I. GRUBER, The Jewish Publication Society, Philadelphia 2007, p. 760–761, 860.

<sup>8</sup> For the Hebrew text of Rashi's commentary on Psalm 148:8, see *Mikra'ot Gedolot Haketer: Psalms*, ed. MENAHEM COHEN, Bar Ilan University Press, Ramat-Gan 2020, vol. II, p. 242.

<sup>9</sup> *Tehillim 'im Perush ha-Ga'on Rabbenu Sa'adia ben Yoseph*, ed. YOSEPH KAPAH, American Academy for Jewish Research, Jerusalem 1966, p. 245–247.

<sup>10</sup> URIEL SIMON, *Four Approaches to the Book of Psalms. From Saadia Gaon to Abraham Ibn Ezra*, SUNY Press, Albany 1991, p. 59–111.

<sup>11</sup> DANIEL FRANK, *Search Scripture Well: Karaite Exegetes and the Origins of the Jewish Bible Commentary in the Islamic East*, Brill, Leiden 2004, p. 166–170.

In his *'Eshkol ha-Kofer*, written in Byzantium in the mid twelfth century, the Karaite Judah Hadassi quotes the first two verses of this psalm to prove that the angels were created on the first day of creation, and that Moses did not mention them specifically in the account of creation in Genesis 1 because they were included in the statement *in the beginning God created heaven and earth* (Gen 1:1).<sup>12</sup> Hadassi also quotes Psalm 148:1–2 to prove that the angels were created for many benefits, because they continually praise God.<sup>13</sup>

The reception of Aristotelian philosophy and science in medieval Judaism changed the exegetical approaches to Psalm 148. Abraham ibn Daud (c. 1110–1180), one of the first Aristotelian Jewish philosophers,<sup>14</sup> made a brief connection between Psalm 148 and the Aristotelian cosmos. In his *Ha-Emunah ha-Ramah* (*The Exalted Faith*), he cites the expression *waters that are above the heavens* (Psalm 148:4) to demonstrate that some biblical expressions cannot be interpreted according to their literal meaning. This expression, when taken literally, means that there are waters above the heavens. Ibn Daud rejects this interpretation and offers an alternative one by alluding to the structure of the cosmos:

והענין הוא כן כי האדם כאדר הבחין השמים והיסודות מצד מעלה ימצא היותר שפל מאלה הגשמים הארץ ולמעלה ממנה המים האויר ולמעלה ממנו האש ולמעלה ממנו התשעה גלגלים. וכאשר יבחין אותם מצד מטה ימצא היותר עליונה שבהם הארץ ותחתיה המים ותחתיהם האויר ותחתיהם הגלגלים התשעה וכוזה יהיה המים למעלה מן השמים ויהיה הירח למעלה משבתאי ולמעלה מגלגל המזלות.

The meaning [of the text] is as follows: [It is the case] that when man probes the heavens and the elements with respect to ascent, he finds [that] the lowest of these bodies is the earth, above it is water, above water is air, above it is fire, and above them are the nine spheres. And when he probes them with respect to descent, he finds [that] the highest of them is earth, below it is water, below it is air, below it is fire, and below them are the nine spheres. In this [way] the waters are above the heavens, the Moon is above Saturn, and it is above the Ecliptic.<sup>15</sup>

<sup>12</sup> SIMON, *Four Approaches*, p. 204. For Hadassi's text, see DANIEL J. LASKER, JOHANNES NIEHOFF-PANAGIOTIDIS, DAVID SKLARE (eds.), *Theological Encounters at a Crossroads. An Edition and Translation of Judah Hadassi's 'Eshkol Ha-Kofer'*, Brill, Leiden-Boston 2018, p. 376–377.

<sup>13</sup> LASKER, NIEHOFF-PANAGIOTIDIS, SKLARE, *Theological Encounters*, p. 416–417.

<sup>14</sup> NORBERT M. SAMUELSON, « Medieval Jewish Aristotelianism: An Introduction », in DANIEL FRANK, OLIVER LEAMAN (eds.) *History of Jewish Philosophy*, Routledge, London–New York 1997, p. 182–194.

<sup>15</sup> ABRAHAM IBN DAUD, *The Exalted Faith*, ed. and trans. NORBERT M. SAMUELSON, Farleigh Dickinson University Press–Associated University Presses, Rutherford et al. 1986, p. 235 and 307. See also ABRAHAM IBN DAUD, *The Exalted Faith. Translated by Solomon Ibn Lavi and by Samuel Ibn Matut with the Anonymous Commentary*, ed. AMIRA ERAN, Ben-Zvi Institute, Jerusalem 2019, p. 627–629.

Ibn Daud takes the expression *waters that are above the heavens* (Psalm 148:4) as an allegory of the sphere of water, which is above the earth and below the spheres of air and fire.

### III. Abraham ibn Ezra

Abraham ibn Ezra, one of the first Jewish authors to use Aristotelian science in his biblical commentaries,<sup>16</sup> wrote a systematic commentary on this Psalm to demonstrate that the biblical text describes the structure, composition and laws of the universe according to the principles of Aristotelian cosmology. In his mind, the division of the psalm into two parts referring to the celestial and the terrestrial worlds coincides exactly with the Aristotelian structure of the cosmos: a great structure divided into several spheres which constitute the two worlds: the upper world and the lower world. The upper world, the world above the moon, is the celestial region, which consists of the spheres of the fixed stars and the planets – the moon, Mercury, Venus, the sun, Mars, Jupiter and Saturn. The lower world, the world below the moon, is the terrestrial region, with the four elements of nature placed in the following order: fire, air, water and earth. The terrestrial or sublunar region is the world of generation and corruption, and of transient changes of all kinds; the celestial or supralunar realm, by contrast, is a region of eternally unchanging cycles. As is well known, scientific matters are frequently discussed and examined in Ibn Ezra's commentaries on the Bible.<sup>17</sup> In the case of Psalm 148, Ibn Ezra developed his exegetical strategies to justify the equivalence between the creatures mentioned in the psalm and the elements of the Aristotelian cosmos.

Abraham ibn Ezra began his commentary on Psalm 148 by defining it as נכבד « a very important Psalm containing deep secrets ». U. Simon points out that when Ibn Ezra refers to a psalm as נכבד 'important', it means that it contains a significant amount of theological exegesis.<sup>18</sup> In the case of Psalm 148, this label is used to call attention to the fact that the psalm contains

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<sup>16</sup> MARIANO GÓMEZ ARANDA, « Aristotelian Theories in Abraham ibn Ezra's Commentaries to the Bible », *Mediterranea: International Journal for the Transfer of Knowledge*, 3 (2018), p. 35–54.

<sup>17</sup> The best monograph on this topic is SHLOMO SELA, *Astrology and Biblical Exegesis in Abraham Ibn Ezra's Thought*, Bar-Ilan University Press, Ramat-Gan 1999. See also JAMES T. ROBINSON, « Philosophy and Science in Medieval Jewish Commentaries on the Bible », in GAD FREUDENTHAL (ed.), *Science in Medieval Jewish Cultures*, Cambridge University Press, Cambridge 2011, p. 454–475.

<sup>18</sup> SIMON, *Four Approaches*, p. 211. For an analysis of Abraham ibn Ezra's commentaries labeled as « important Psalms » or « distinguished Psalms », see HERZLIYA WAGNER, « The 'Distinguished Chapters' in Abraham Ibn Ezra's Commentary on the Book of Psalms: Philosophy and Biblical Exegesis », Ph.D. Diss. Bar-Ilan University 2012. For the Hebrew text of Abraham ibn Ezra's commentary on Psalm 148, I have followed Wagner's critical edition in p. 230–237, as well as COHEN, *Haketer: Psalms*, vol. II, p. 240–245.

issues alluding to scientific matters that can only be understood through scientific knowledge. In this sense, Psalm 19 is labeled as « a very important Psalm » for it deals « with the work of heavens ». Ibn Ezra adds that only those who have studied the science of astronomy are able to understand the meaning of this psalm.<sup>19</sup> According to Ibn Ezra, Psalm 49 is « a very important Psalm, for it explicitly speaks of the light of the world to come and of the rational soul which is immortal ».<sup>20</sup> He explains that it alludes to the return of the four elements of the human body to their original elements after death, whereas the human soul will cleave to the soul of the heavens; it also alludes to the benefits of wisdom in the world to come. As in the case of Psalm 19, Ibn Ezra affirms at the end of his comments on Psalm 49 that those who do not learn are unable to understand the allusions of the psalm.

Abraham ibn Ezra also affirms that Psalm 148 contains « deep secrets ». At the end of the first chapter of his *Sefer Yesod Mora we-Sod Tora*, Ibn Ezra defines what he considers « deep secrets » to be:

רק היודע חכמת התולדות וכל ראיותיה וחכמת המבטא יוכל לדעת הכללים שהם שמורים כחותם. וחכמת המזלות ידענה בראיות גמורות מחכמת החשבון וחכמת המדות וחכמת הערכים, אז יוכל לעלות גבוה למעלה לדעת סוד הנפש ומלאכי עליון והעולם הבא. ומהתורה ומדברי הנביאים ומדברי חכמי התלמוד יחכם, ויבין סודות עמוקים שנעלמו מעיני רבים, וקצתם אפרש.

Only when one knows the natural sciences and their proofs, learns the categories that are the walls of reason taught by the science of logic, masters the science of astronomy with its absolute proofs based on mathematical knowledge, and comprehends the science of geometry and the science of proportions, can one ascend to the great level of knowing the secret of the soul, the secret of the supernal angels, and the concept of the world to come as taught in the Tora, the Prophets, and by the Sages of the Talmud. Such an individual will grasp and perceive the *deep secrets* – a few of which I will explain – that are hidden from the eyes of most people.<sup>21</sup>

Thus, according to Ibn Ezra, such deep secrets as the human soul, the supernal angels, and the world to come can only be understood through knowledge of the

<sup>19</sup> For Ibn Ezra's comments on Psalm 19:2, see COHEN, *Haketer: Psalms*, vol. I, p. 57.

<sup>20</sup> COHEN, *Haketer: Psalms*, vol. I, p. 152. On this translation, see ABRAHAM IBN EZRA, *Commentary on the Second Book of Psalms: Chapters 42-72*, trans. H. NORMAN STRICKMAN, Academic Studies Press, Boston 2009, p. 41.

<sup>21</sup> ABRAHAM IBN EZRA, *Yesod Mora Ve-Sod Torah: The Foundation of Reverence and the Secret of the Torah*, eds. JOSEPH COHEN, URIEL SIMON, Bar-Ilan University Press, Ramat-Gan 2007, p. 89–90. For this English translation, ABRAHAM IBN EZRA, *The Secret of the Torah*, trans. H. NORMAN STRICKMAN, Jason Aronson, Northvale, NJ–London 1995, p. 34–35.

sciences of logic, astronomy and geometry, among others, and such knowledge is « hidden from the eyes of most people ».

What, then, are these deep secrets in Psalm 148 that are hidden from most people? According to Ibn Ezra, Psalm 148 reproduces the Aristotelian structure of the cosmos. However, Ibn Ezra adapts it to the needs of his exegetical purposes, and describes the heavenly beings in the first part of the psalm in clear contrast with the earthly beings in the second part.<sup>22</sup>

Ibn Ezra describes the upper world as *העולם הרחב והגדול* « the wide and large world » and the lower world as *הנקודה במחשבת החושב בעגולה גדולה* « the imaginary point at the center of the big circle ». This description refers to the earth surrounded by the circle of the heavens. Abraham ibn Ezra also uses this terminology in his comments on Job 36:16, where he differentiates between the *raḥab*, which refers to the circle surrounding the earth, and the *muṣaq*, which is the central point, that is, the earth. In his comments on Job 37:10, he explicitly defines the term *muṣaq* as *הארץ, שהיא כנקודה באמצע הגלגלים* « the earth, which stands as the central point of the spheres ».<sup>23</sup>

In the case of the *angels* explicitly mentioned in verse 2, Abraham ibn Ezra simply affirms that they are beings *שאינם גופות* « not endowed with bodies »; however, he makes no attempt to identify them with any scientific or philosophical concept.

By contrast with the angels, Ibn Ezra explains that the expression *all His hosts* in verse 2 refers to the heavenly beings as *הם גופות טהורות ולא מורכבות, והם כוכבים* « having pure bodies not composed of the four elements, they are the numerous stars placed at the sphere of the zodiacal signs ». He is referring to the Aristotelian fifth element of which the heavenly bodies are made. *The sun and the moon* in verse 3 represent the seven planets. Ibn Ezra goes on to explain that the reason that only the sun and the moon are explicitly mentioned in the psalm is that they are the *moshelim* (lit. 'the lords', 'the rulers'), that is, they are the dominant astrological influences, because they have stronger influences than the other planets. The expression *stars of light* refers to all seven planets, and is used because they give off more light than the rest of the stars, since the planets are nearer to the earth.

Regarding the expression *heaven of heavens* (verse 4), Ibn Ezra is ambiguous, in the exegetical context, in using it to refer to various indeterminate parts of the

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<sup>22</sup> For a brief analysis of Ibn Ezra's comments on this Psalm, see GÓMEZ ARANDA, « Aristotelian Theories », p. 36–39.

<sup>23</sup> ABRAHAM IBN EZRA, *El comentario de Abraham ibn Ezra al libro de Job*, ed. and trans. MARIANO GÓMEZ ARANDA, CSIC, Madrid 2004, p. 70\*, 73\*, 265, and 276. On the use of this terminology by Ibn Ezra, see SHLOMO SELA, « Abraham Ibn Ezra's Special Strategy in the Creation of a Hebrew Scientific Terminology », *Micrologus*, 9 (2001), p. 65–87, esp. p. 78–81.

heavenly realm. It can either refer to the heavens above the firmament,<sup>24</sup> or to a holy place in contrast to the other heavens,<sup>25</sup> or to the place from which the human soul proceeds,<sup>26</sup> or to all the heavens in opposition to the earth,<sup>27</sup> or to the abode of God and the angels.<sup>28</sup> In his *Book of the Judgements of the Zodiacal Signs*, it is the only occasion in which the expression *heaven of heavens* is used to refer specifically to the sphere of the constellations, the eighth sphere.<sup>29</sup>

In the particular context of Psalm 148, the expression *heaven of heavens* is taken by Ibn Ezra to refer to *כדור האש שהוא סמוך אל כדור הלבנה* « the sphere of fire, which is attached to the sphere of the moon », that is, it refers to the sphere of elemental fire, which is located immediately below the sphere of the moon. In this specific case, Ibn Ezra provides this explanation to make the biblical text conform to the theory of the structure of the elements in the universe. In his comments on Job 28:24, he also identifies the word *heavens* with elemental fire.<sup>30</sup>

Ibn Ezra goes on to explain that the next element, the *waters that are above the heavens* (Psalm 148:4), refers to *כדור הסגריר* « the sphere of *sagrir* ». The term *sagrir*, literally ‘steady rain’ or ‘persistent rain’, is unusual in Ibn Ezra’s terminology, for he never uses it in his scientific treatises. In his comments on Psalm 104:3, Ibn Ezra identifies the *clouds* mentioned in the verse with *כדור הסגריר* « the sphere of *sagrir* ». In his comments on the expression *who builds his upper chambers (ma’alot) in the heavens* (Amos 9:6), Ibn Ezra interprets the word *ma’alot* as a reference to *גלגלי הרוח והקור והאש, כי הם כולם גלגלים זה למעלה מזה, והנה אלה בין הארץ ובין השמים* « the spheres of wind, coolness and fire, which are one above the other between the earth and the heavens ». As U. Simon points out, here Ibn Ezra is referring exclusively to the spheres of air and fire; by contrast, the verse refers to *the earth* and *the waters of the sea* as part of the terrestrial world.<sup>31</sup> This is precisely Abravanel’s interpretation of Ibn Ezra’s words: *ראב"ע כתב... שבשמים: « מעלותיו אמר על שני היסודות, אש ואויר, שהם גלגלים זה למעלה מזה* Abraham ibn Ezra wrote [...] that *his upper chambers in the heavens* refer to the two elements, namely fire and air, whose spheres are one above the other ». <sup>32</sup> In his *Hay ben Meqqiṣ*, Ibn

<sup>24</sup> IBN EZRA’S long commentary on Genesis 1:14.

<sup>25</sup> IBN EZRA’S short commentary on Exodus 15:11.

<sup>26</sup> IBN EZRA’S commentary on Psalm 102:25.

<sup>27</sup> IBN EZRA’S commentary on Psalm 102:26.

<sup>28</sup> IBN EZRA’S long commentary on Daniel 10:21 and to Psalm 68:34.

<sup>29</sup> ABRAHAM IBN EZRA, *Introductions to Astrology: A Parallel Hebrew-English Critical Edition of the ‘Book of the Beginning of Wisdom’ and the ‘Book of the Judgements of the Zodiacal Signs’*, ed. and trans. SHLOMO SELA, Brill, Leiden–Boston 2017, p. 489 and fn. at p. 559.

<sup>30</sup> IBN EZRA, *Comentario al libro de Job*, p. 53\* and 205.

<sup>31</sup> ABRAHAM IBN EZRA, *Two Commentaries on the Minor Prophets: Hosea, Joel, and Amos*, ed. URIEL SIMON, Bar-Ilan University Press, Ramat-Gan 1989, p. 260, including fn.

<sup>32</sup> ISAAC ABRAVANEL, *Don Isaac Abrabanel y su comentario al libro de Amós*, ed. and trans. GREGORIO RUIZ GONZÁLEZ, Universidad Pontificia de Comillas, Madrid 1984, p. 220–221.

Ezra considers that the sphere of air is the area where rain, wind and hail occur.<sup>33</sup> Therefore, the expression *waters that are above the heavens* (Psalm 148:4) corresponds with the sphere of air in the Aristotelian cosmos, which is immediately below the sphere of fire, as Ibn Ezra points out. Ibn Ezra continues his commentary on Psalm 148:4 by affirming that « the sphere of *sagrir* », that is, the sphere of air, marks the limit of the upper world. According to him, water and earth both belong to the terrestrial realm.<sup>34</sup>

Ibn Ezra continues his explanations by affirming that the expression *He made them endure forever and ever* in verse 6 means that the heavenly beings are eternal and unchangeable, because they are pure bodies, not composed of the four elements, and therefore not subject to generation and corruption. It is a clear reference to the eternity of the upper world, in consonance with the eternity of the universe in Aristotelianism. In his commentary on Ecclesiastes 1:9, Ibn Ezra uses verses 5–6 and 13 of Psalm 148 to contrast the upper creatures, which were made by God to be eternal, with the earthly creatures, which are subject to generation and corruption since they are composed of the four elements.<sup>35</sup>

According to Ibn Ezra, the expression *establishing an order which shall not be broken* (Ps. 148:6) refers to the eternal law that regulates the motions of the planets: each planet has a specific orbit around which it circles the earth and, since its motion is cyclical, it has no beginning or end. In consequence, this order *shall not be broken*. In his commentary on Ecclesiastes 3:15, Ibn Ezra explains the expression *that which is, already has been, that which is to be, already is* as an allegory of the eternal motion of the celestial beings around the earth: since time depends on their cyclical motion, time is continuous and shall not cease.<sup>36</sup>

Abraham ibn Ezra explains that the natural phenomena cited in the verse *fire and hail, snow and smoke, and stormy wind* (Psalm 148:8) have their origin in the earth, not in heaven, and for this reason they are mentioned in connection with the earth. In this sense, he provides a scientific basis for the observation made in the Talmud on these phenomena's connection with the earth instead of with heaven.<sup>37</sup> Ibn Ezra also adds that these phenomena are contrary to one another,

<sup>33</sup> ABRAHAM IBN EZRA, *Iggeret Hay ben Meqitz*, ed. ISRAEL LEVIN, Tel Aviv University Press, Tel Aviv 1983, p. 68–69. For an analysis of this work, see AARON W. HUGHES, « The Three Worlds of Ibn Ezra's *Hay Ben Meqitz* », *Journal of Jewish Thought and Philosophy*, 11 (2002), p. 1–24.

<sup>34</sup> For an analysis of Ibn Ezra's comments on Psalm 148:4, see ESTI EISENMANN, « On the Heavens in Medieval Jewish Philosophy », *AJS Review*, 35 (2011), p. 1–20 (Hebrew Section), esp. p. 3.

<sup>35</sup> ABRAHAM IBN EZRA, *El comentario de Abraham ibn Ezra al libro del Eclesiastés*, ed. and trans. MARIANO GÓMEZ ARANDA, CSIC, Madrid 1994, p. 14\* and 21–22.

<sup>36</sup> ABRAHAM IBN EZRA, *El comentario de Abraham ibn Ezra al libro del Eclesiastés*, p. 31\*–32\*, and 54–55. On the use of scientific theories in Ibn Ezra's commentary on Ecclesiastes, see MARIANO GÓMEZ ARANDA, « The Meaning of Qohelet According to Ibn Ezra's Scientific Theories », *Aleph*, 6 (2006), p. 339–370.

<sup>37</sup> *BHagigah* 12b.

but does not explain any further. He defines *fire* as הממיתה בריחה « the fleeing fire which causes death », probably a reference to lightning. In his *Book of the Beginning of Wisdom*, Ibn Ezra connects fire with lightning by affirming that when the sun travels through Aries, which is a fiery sign, it gives rise to thunder and lightning.<sup>38</sup>

*Smoke* is defined by Ibn Ezra as האיד העולה כדמות עשן שהוא חם « the exhalation arising [from the earth] and resembling hot smoke ». Ibn Ezra uses this definition to prove that the natural phenomena mentioned in verse 8 originate in the earth.

In the case of the earthly beings mentioned in the second part of the psalm (verses 7-14), Ibn Ezra observes that they appear in an order opposite to that of the heavenly beings: whereas the heavenly beings are ordered from highest to lowest, the earthly beings are mentioned from the lowest – *the sea monsters*, mentioned in verse 7 – to the highest – *the people of Israel*, the highest people in rank, mentioned in verse 14.

Ibn Ezra also gives some explanations as to why these specific earthly beings are explicitly mentioned. He observes that several pairs of opposing beings appear in the text, and explains what the element is that distinguishes them. The expression *all sea monsters and ocean depths* (Psalm 148:9) refers to both living and non-living things. The word ההרים ‘mountains’ in verse 9 is related to the root הרה ‘to conceive’, ‘to be pregnant’, and it means that the mountains « are pregnant » with metals; by contrast, *hills* have no metals.

From the mountains, the psalm moves on to the valleys and mentions *fruit trees and cedars*, the latter of which bear no fruit. *Wild animals* in verse 10 are those which do not live with human beings, while *cattle* are those which do. In the case of human beings, the psalm mentions *kings of the earth*, who are the most honored among human beings, and *all peoples*, who are under the power of the former. The psalm then mentions *princes*, who exert power without considering the law, and *judges*, who apply the law. *Youths and maidens* refer to the distinction between men and women, and *old and young* to the distinction in the passage of time and the changes in human strength. Ibn Ezra concludes that all individuals perish, but the genera persist, and for this reason the biblical text affirms that *His name alone is exalted* (Psalm 148:13). The same idea is expressed in his commentary on Ecclesiastes 1:9.<sup>39</sup>

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<sup>38</sup> IBN EZRA, *Introductions to Astrology*, p. 59.

<sup>39</sup> IBN EZRA, *Comentario a Eclesiastés*, p. 14\*-15\*, 21-22, and GÓMEZ ARANDA, « The Meaning of Qohelet », p. 350.

#### IV. *Ibn Sina and Abu Ma'shar as Sources of Ibn Ezra's Scientific Comments*

As is well known, Abraham ibn Ezra did not have access to the original Greek texts of Aristotle's works, and it is difficult to prove whether he used any of their Arabic translations directly. Rather, Ibn Ezra most probably studied Aristotelian cosmology through the works of medieval Aristotelian authors. One of the possible candidates is Ibn Sina; indeed, that Ibn Ezra was familiar with Ibn Sina's ideas has been demonstrated by several scholars.<sup>40</sup>

Ibn Ezra's ideas of an eternal heavenly region made of the element ether, and not subject to generation and corruption like the beings composed of the four elements in the sublunar world, may have been taken from Ibn Sina's cosmology.<sup>41</sup> Freudenthal has pointed out the possible influence of Ibn Sina on Ibn Ezra's interpretation of the Creation of Genesis, whereby the biblical text would refer exclusively to the creation of the sublunar world, assuming the eternity of the supralunar world. This idea was also followed by Samuel ibn Tibbon. Freudenthal concludes that either both authors drew on Ibn Sina's theory of an eternal world, or that Ibn Ezra inspired Ibn Tibbon.<sup>42</sup>

By including the angels in the upper world – besides the obvious reason that they are explicitly mentioned in the psalm – Ibn Ezra coincides with Ibn Sina. In explaining the process of existence, Ibn Sina affirms that the existing things proceeding from God are ordered in ranks: the first rank is that of the spiritual angels devoid of matter, then the rank of active angels, then the ranks of the celestial bodies, and then the ranks of the elements in the world of generation and corruption.<sup>43</sup> Ibn Sina also explains that the celestial spheres have noncorporeal principles.<sup>44</sup> In his *Physics*, he specifically mentions « the sun, the moon, and the like » as those beings « whose matter is not subject to change and corruption ». <sup>45</sup> In his *Metaphysics*, he also refers to the idea that « the celestial

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<sup>40</sup> See, for example, WARREN Z. HARVEY, « The First Commandment and the God of History: Halevi and Crescas vs. Ibn Ezra and Maimonides », *Tarbiz*, 57 (1988), p. 203–216 [in Hebrew]; STEVEN HARVEY, « Avicenna's Influence on Jewish Thought: Some Reflections », in Y. TZVI LANGERMANN (ed.), *Avicenna and His Legacy: A Golden Age of Science and Philosophy*, Brepols, Turnhout 2009, p. 327–340, especially p. 329; RESIANNE FONTAINE, « 'Happy Is He Whose Children Are Boys': Abraham Ibn Daud and Avicenna on Evil », in DAG NIKOLAUS HASSE, AMOS BERTOLACCI (eds.), *The Arabic, Hebrew and Latin Reception of Avicenna's Metaphysics*, Walter de Gruyter, Berlin–Boston 2012, p. 159–175, esp. p. 164; GÓMEZ ARANDA, « Aristotelian Theories », p. 48–51.

<sup>41</sup> SEYYED HOSSEIN NASR, *An Introduction to Islamic Cosmological Doctrines*, Thames and Hudson, Bath 1978, p. 237.

<sup>42</sup> GAD FREUDENTHAL, « Samuel Ibn Tibbon's Avicennian Theory of an Eternal World », *Aleph*, 8 (2008), p. 41–129, esp. p. 98–99.

<sup>43</sup> AVICENNA, *The Metaphysics of the Healing*, ed. MICHAEL E. MARMURA, Brigham Young University Press, Provo, UT 2005, p. 21–22, 358.

<sup>44</sup> AVICENNA, *The Metaphysics*, p. 333.

<sup>45</sup> AVICENNA, *The Physics of the Healing*, ed. JON MCGINNIS, Brigham Young University Press, Provo, UT 2009, p. 7.

bodies have an influence on the bodies of this world through the qualities proper to them, some of which flows to this world », <sup>46</sup> a central principle in Ibn Ezra's astrology.

Contrary to Ibn Sina's cosmology, in which the four elements all belong to the world of generation and corruption – the world below the moon <sup>47</sup> – Abraham ibn Ezra includes the spheres of fire and air within the limits of the superior world, because they are mentioned in the text of Psalm 148:2–6 in connection with the heavenly beings; on the contrary, earth and water are mentioned in connection with earthly beings and atmospheric phenomena in Psalm 148:7–13. Ibn Ezra here considers the universe as divided into two regions, such that the lower region is formed by the earth and the water which is on it, and the upper region is formed by the spheres of the other two elements (air and fire), the sphere of the moon and those of the other planets, the sphere of the fixed stars, and the celestial world of angels. He stresses the contrast between the two worlds to reinforce the idea that he exposes in the explanation of the following verses: that the celestial beings are eternal and the earthly beings are perishable.

Abraham ibn Ezra also coincides with Ibn Sina in his description of certain meteorological phenomena. Paul Letting has proven that Ibn Sina used Aristotle's *Meteorology*, which was translated into Arabic in the ninth century. Ibn Sina deals with meteorological phenomena in the part of his *Kitāb as-Šifā'* on natural philosophy. He affirms that all natural phenomena are caused by vapor and smoke that are dissolved from the earth by the celestial heat. He also explains that vapor forms clouds and is the cause of rain, snow, wind and other phenomena which occur in the lower atmosphere.

Abraham ibn Ezra's definition of the biblical *smoke* as « the exhalation arising [from the earth] and resembling the hot smoke » coincides with Ibn Sina's concept of 'smoke' as a type of evaporation different from 'vapor'. In the section of his *Kitāb an-Najāt* dedicated to meteorological phenomena, Ibn Sina explains smoke as the dry and light evaporation rising up from earthly bodies through the heating power of the heavenly sphere; by contrast, vapor is a moist and heavy evaporation. <sup>48</sup>

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<sup>46</sup> AVICENNA, *The Metaphysics*, p. 337.

<sup>47</sup> NASR, *An Introduction*, p. 240.

<sup>48</sup> PAUL LETTING, *Aristotle's Meteorology and its Reception in the Arab World: With an Edition and Translation of Ibn Suwār's 'Treatise on Meteorological Phenomena' and Ibn Bājjā's 'Commentary on the Meteorology'*, Brill, Leiden 1999, p. 54–57, 111–113, 177–182. On the use of Aristotle's *Meteorology* in medieval Judaism, see RESIANNE FONTAINE, « 'Tibbonide Terminology' and Hebrew Meteorological Texts », in REIMUND LEICHT, GIUSEPPE VELTRI (eds.), *Studies in the Formation of Medieval Hebrew Philosophical Terminology*, Brill, Leiden-Boston 2019, p. 64–75, especially p. 65–66; « Meteorology and Zoology in Medieval Hebrew Texts », in GAD FREUDENTHAL (ed.), *Science in Medieval Jewish Cultures*, Cambridge University Press, Cambridge 2011, p. 217–229.

In drawing a connection between mountains and metals, Ibn Ezra follows Ibn Sina's explanations in his *Kitāb aš-Šifā'*. In the treatise dealing with geological matters, Ibn Sina explains that mountains play an important role in the formation of metals. Metals are formed by the action of vapor that is enclosed in the earth, and mountains act as a solid alembic that produces distillation. He also affirms that metals are formed in mountains more than in other areas.<sup>49</sup>

Some of Ibn Ezra's ideas expressed in his comments on Psalm 148 point to the possibility that Abu Ma'shar's *Great Introduction to Astrology* was one of the sources from which he drew information on Aristotelian cosmology.<sup>50</sup> Ibn Ezra cites Abu Ma'shar in his scientific writings, and considers him as the most relevant authority on astrology.<sup>51</sup>

Ibn Ezra coincides with Abu Ma'shar in that the spheres of stars possess an eternal circular motion around the earth, the size of which is described by Abu Ma'shar « in its smallness in respect to the highest sphere like a point in respect to a circle ». <sup>52</sup> Abu Ma'shar refers to the four elements as terrestrial bodies, which are placed below the sphere of the moon in the following natural order: fire, « which is the highest and most subtle of these four elements, and the nearest to the celestial bodies and the sphere of the moon », air, water and earth. However, he distinguishes between the upward motion of fire and air and the downward motion of water and earth. He also establishes two levels of elements: two are light and high, namely air and fire, and two are heavy and thick, namely water and earth. The separation that Abu Ma'shar makes between the upper elements (fire and air) and the lower elements (water and earth) may have inspired Ibn Ezra to include fire and air in the upper world.<sup>53</sup>

As we shall see now, Ibn Ezra's scientific explanations of the Psalm were the starting point for future scientific analyses by other medieval Jewish exegetes such as David Qimhi and Menahem ha-Meiri.

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<sup>49</sup> LETTINCK, Aristotle's *Meteorology*, p. 142.

<sup>50</sup> That Abu Ma'shar's *Great Introduction to Astrology* contains some of the most important characteristics of medieval Aristotelian physics and cosmology was conclusively proven by RICHARD LEMAY, *Abu Ma'shar and Latin Aristotelianism in the Twelfth Century: The Recovery of Aristotle's Natural Philosophy through Arabic Astrology*, American University of Beirut, Beirut 1962.

<sup>51</sup> On the connections between Ibn Ezra and Abu Ma'shar, see SHLOMO SELA, « Abraham Ibn Ezra as the Translator of Astrological and Astronomical Texts from Arabic into Hebrew: Sources and Methods », *Medieval Encounters*, 25 (2019), p. 345–380, esp. p. 348–352, and GÓMEZ ARANDA, « Aristotelian Theories », p. 51–53.

<sup>52</sup> ABU MA'SHAR, *The Great Introduction to Astrology by Abū Ma'shar*, ed. and trans. KEIJI YAMAMOTO, CHARLES BURNETT, Brill, Leiden 2019, vol. I, p. 53 and 83.

<sup>53</sup> ABU MA'SHAR, *The Great Introduction*, p. 83, 197, and 199–201.

V. David Qimhi

David Qimhi follows Abraham ibn Ezra's interpretations in his grammatical treatises as well as in his biblical commentaries. Ibn Ezra is quoted by name in David Qimhi's *Sefer ha-Miklol* and *Sefer ha-Shorashim*, as well as in his commentaries on Genesis and Psalms.<sup>54</sup>

In his commentary on Psalm 148, David Qimhi follows Ibn Ezra to distinguish between the two worlds.<sup>55</sup> The upper world is described in terms similar to those used by Ibn Ezra: it is העולם הגדול « the large world »; by contrast, the lower world is called העולם הקטן « the small world ».

According to Qimhi, the expression *from the heavens* in verse 1 refers to all the heavenly beings that have their origin in heaven and who are מיסוד השמים, שהוא « made of the heavenly element, which is the fifth element », a clear reference to the Aristotelian fifth element. Qimhi adds that the heavenly beings include pure forms which neither are bodies nor are placed in bodies. As in the case of Ibn Ezra, Qimhi implies that the heavenly beings stand in clear contrast with the earthly beings, composed of the four elements.

David Qimhi follows Ibn Ezra's definition of the *angels* in verse 2 as הם אינם גופות « those beings neither endowed with bodies nor placed in bodies ». But, in addition to this, Qimhi identifies the angels with השכלים « the separate intellects ». It is not the only instance in which he makes this identification. In his comments on Psalm 27:4, David Qimhi explicitly mentions that the separate intellects are the angels of heaven, from which the soul is derived and to which it will return.<sup>56</sup> In this identification, Qimhi does not follow Abraham ibn Ezra but Maimonides.

Maimonides identified the angels with the 'separate intellects'. In his *Guide of the Perplexed* (1:49),<sup>57</sup> he affirms: « The angels too are not endowed with bodies, but are intellects separate from matter ». He also expresses that the point of disagreement between him and Aristotle regarding the angels is only a question

<sup>54</sup> On the influence of Abraham ibn Ezra on David Qimhi, see ABE LIPSHITZ, « Ibn Ezra be-Perushe R. David Qimhi u-bi-Sefarav », *Sinai*, 61 (1967), p. 92–109, and ABRAHAM I. BROMBERG, « R. David Kimhi as a Supercommentator on R. Abraham Ibn Ezra's Commentary on the Book of Psalms », *Sinai*, 63 (1967), p. 4–12 (Hebrew). Bromberg analyzes David Qimhi's commentaries on several Psalms to conclude that they can be considered as supercommentaries on Ibn Ezra's commentaries; however, Psalm 148 is not included among them.

<sup>55</sup> For the Hebrew text of David Qimhi's commentary on Psalm 148, see COHEN, *Haketer: Psalms*, vol. II, p. 241–246. For an English translation, see DAVID QIMHI, *The Commentary of Rabbi David Kimhi on Psalms CXX–CL*, eds. and trans. JOSHUA BAKER, ERNST W. NICHOLSON, Cambridge University Press, Cambridge 1973, p. 154–165.

<sup>56</sup> COHEN, *Haketer: Psalms*, vol. I, p. 85.

<sup>57</sup> MOSES MAIMONIDES, *The Guide of the Perplexed* 1:49, trans. SHLOMO PINES, The University of Chicago Press, Chicago–London 1963, p. 108.

of terminology: « He [Aristotle] speaks of separate intellects, and we speak of angels » (Guide 2:6).<sup>58</sup>

However, David Qimhi adds another relevant definition of the angels in verse 2. He affirms that they are *השוקי הגלגלים* « those desired by the spheres ». Why are the angels desired by the spheres? To what desire is David Qimhi referring? The formulation used by Qimhi coincides with Maimonides's explanations on the motions of the spheres. In *Guide of the Perplexed* (2:10), Maimonides mentions that the motion of every sphere has four causes: the shape of the sphere; its soul; its intellects, through which it has conceptions; and the separate intellect, which is its beloved. Regarding the fourth and final cause, Maimonides explains that every sphere has a desire inciting it to motion.<sup>59</sup> Following Maimonides, Qimhi means to say that the desire of the angels is what incites the spheres to move, as they attempt to reach them.

David Qimhi affirms that *all his hosts* in verse 2 are the clear and bright bodies which consist of the constellations and the stars in the eighth sphere. In his explanation of verse 3, David Qimhi reproduces the exact comments of Ibn Ezra: his mention of the sun and the moon includes the other five planets. The planets are called *stars of light* because they give more light to the earth than the stars in the eighth sphere, being nearer to the earth than the latter.

As for verse 4, David Qimhi gives two interpretations. The first one is attributed to « some of our sages », who explain that *heaven of heavens* is a superlative expression meaning the highest of the celestial beings, who are incorporeal forms. He adds that the term 'highest' must be understood qualitatively, not spatially, and refers to the world of souls. The *waters that are above the heavens* are the highest forms from which pure forms are derived.

The second interpretation quoted by David Qimhi is in fact a reinterpretation of Abraham ibn Ezra's comments on this same verse, although Qimhi does not cite him by name. *Heaven of heavens* is *כדור האש שהוא סמוך אל כדור הלבנה* « the sphere of fire adjacent to the sphere of the moon ». The second term of the construct state, that is, *heavens*, refers to the air. *The waters that are above the heavens* are *כדור הקרח, ויש קוראים שמו 'כדור הסגריר'* « the sphere of ice, also called the sphere of *sagrir* ». Qimhi employs the same term used by Ibn Ezra: *sagrir*. But Qimhi expands on Ibn Ezra's explanation by adding that it is situated between the sphere of fire and the air which is near us (i.e., the atmosphere) and represents the furthest place reached by the clouds. Qimhi is probably misinterpreting Abraham ibn Ezra's explanation, identifying the sphere of *sagrir* with the sphere of water instead of the sphere of air. It is not the only instance in

<sup>58</sup> MOSES MAIMONIDES, *Guide 2:6*, trans. PINES, p. 262. On this identification in Maimonides's thought, see JAMES A. DIAMOND, *Maimonides and the Hermeneutics of Concealment: Deciphering Scripture and Midrash in the 'Guide of the Perplexed'*, SUNY Press, Albany 2002, p. 57–59.

<sup>59</sup> MOSES MAIMONIDES, *Guide 2:10*, trans. PINES, p. 271.

which Qimhi misinterprets Ibn Ezra's interpretation of the spheres of the elements. In his commentary on Amos 9:6, Qimhi affirms that החכם רבי אברהם פירש « Abraham ibn Ezra interpreted that *the heavens* is the air and *the upper chambers* are the other three [!] elements, placed in spheres one above the other ». <sup>60</sup> Qimhi is referring to Ibn Ezra's expression « the spheres of wind, coolness and fire », which the former interprets as a reference to the elements water, earth and fire.

However, David Qimhi adds an objection to the interpretation of *the waters that are above the heavens* as the sphere of water. He affirms that ואין חכמי המחקר « scientists do not accept this, for they say that there is only air and natural fire between us and the sphere of the moon ». In other words, there is no such thing as a sphere of water. The same objection is found in his commentary on Psalm 104:3. He cites the opinion of those who explain that the *waters* mentioned in this verse allude to the waters that are above the firmament. He adds that scientists reject such an interpretation, because there is no water above the firmament. <sup>61</sup> In the case of Psalm 148:4, Qimhi proposes that the biblical expression *waters that are above the heavens* must be interpreted as the place in the air where the clouds are directed to be formed (והוא מקום תכלית הגעת העבים באויר). He adds that במקום ההוא מן האויר « in that place in the air, the clouds are converted into water, and fall in their natural course on the earth ». This is precisely the explanation given by Abraham ibn Ezra in his commentary on Ecclesiastes 1:7: the clouds are formed by the action of the evaporation of the sea, which is then converted into water and returns to the place from which it proceeds: springs originate from the rain, and rivers proceed from springs and flow to the sea; for this reason, the biblical text affirms that *all rivers run to the sea, but the sea is not full; to the place where the rivers flow, there they continue to flow*. <sup>62</sup> David Qimhi ends his comments by affirming that *the waters that are above the heavens* refers to the air or the atmosphere, which he considers not a pure element but « [a body] composed of several qualities ».

David Qimhi's comments resemble some of the explanations found in chapter seven of *Ruah Hen (Spirit of Grace)*. The author of this work describes the spherical shells of the four elements below the sphere of the moon according to Aristotelian physics: the first one is fire, which is naturally hot and dry; the next one is air, which is hot and wet; the following one is water, which is cold and wet; and the next one is earth, which is cold and dry. However, the elements are not

<sup>60</sup> MENAHEM COHEN (ed.), *Mikra'ot Gedolot Haketer: The Twelve Minor Prophets*, Bar Ilan University Press, Ramat-Gan 2012, p. 141.

<sup>61</sup> COHEN, *Haketer: Psalms*, vol. I, p. 106.

<sup>62</sup> IBN EZRA, *Comentario a Ecclesiastés*, p. 12\* and 18–19.

placed in such an ideal set of concentric shells; rather, the motions of the celestial spheres cause them to be intermingled.<sup>63</sup> He also explains that it is in the nature of each element to move to reach its natural place in a linear motion. Referring to elemental water, he explicitly states that, *המים, בהיותם על האויר בהכרח, ישונו דרך ישרה לארץ ולימים* « as water is necessarily placed in the air or generated from clouds, it will return directly to earth and seas ».<sup>64</sup> The author implies that water is in the sphere of air together with that from which clouds are formed, and that its natural tendency is to return to the earth and seas from which it proceeds. In fact, he admits that there is air below and above water, and that air is in contact with both elemental fire and elemental earth. David Qimhi is probably alluding to *Ruah Hen* when he quotes the opinion of scientists who affirmed that between the earth and natural fire there is, in fact, only air.

In his interpretation of verse 6, David Qimhi clearly follows Abraham ibn Ezra: *He made them endure forever and ever* (Ps. 148:6) means that the superior beings are eternal, because their internal constitution or substance is not subject to change. However, unlike Ibn Ezra, David Qimhi considers that the superior beings were also created, as with the rest of the creatures.

Regarding the expression *fire and hail, snow and smoke* in verse 8, Qimhi follows Ibn Ezra's comments, expanding upon his explanations with further details: although these natural phenomena take place in the air, they are originally derived from the earth: *« והכמי התולדות יקיימו זה בראיות גמורות: and natural scientists prove this with decisive proofs »*. He not only observes that they are two pairs of opposites as Ibn Ezra did, but also explains the meaning of this opposition through reference to their natural qualities: fire is hot and hail is cold, snow is cold and smoke is hot. Following Ibn Ezra, David Qimhi defines *fire* as *הוא אש הברק* « the fire of lightning which kindles the object upon which it alights ». Of *hail* he says that the meaning is evident. His definition of *smoke* is in fact an extension of Ibn Ezra's definition: *« והוא האיד העולה מן הארץ, דומה לעשן והוא חם ויבש »* « the exhalation arising from the earth, and bears a close resemblance to smoke: it is hot and dry ». On the expression *stormy wind fulfilling His command*, Qimhi explains that air moves as a result of a rising exhalation; the reason that it is qualified as *stormy* is due to the fact that *תפיל הארזים הגבוהים, כשהוא מתנועע בחזקה, « when it moves about with force, it pulls down tall cedars, buildings, and ships on the sea »*. He adds that wind does not function through mere accident, but fulfills God's commands and *« היא מתנועעת לעונש המקבלים « moves about to punish those who receive it »*.

<sup>63</sup> OFER ELIOR (ed.), *A Spirit of Grace Passed before My Face: Jews Reading Science, 1210–1896*, Ben Zvi Institute, Jerusalem 2016, p. 251–253.

<sup>64</sup> OFER ELIOR, *A Spirit of Grace*, p. 251.

On the reason why sea monsters are mentioned first among the earthly beings, David Qimhi explains that it is « because they are bigger than the beasts on earth ». In the case of the rest of the earthly beings mentioned in verses 9–10, Qimhi follows Ibn Ezra's idea that the biblical text mentions several pairs of opposing beings. He coincides with Ibn Ezra in considering that the term *mountains* includes the metals. He remarks that the *creeping things* in verse 10 refer to the lowest orders of the animal kingdom, and *winged birds* to the highest species of dumb animals. This interpretation is not found in Ibn Ezra. Similar to Ibn Ezra, Qimhi concludes that in the case of the earthly beings, « their greatness is transient and ephemeral »; for this reason, « kings of the earth, princes and judges should not pride themselves on their greatness, for in a short time their greatness will have ceased and vanished, so that they will confess that exaltation and greatness pertain to God alone ».

David Qimhi observes that the psalm commands creatures not endowed with intellect to praise the Lord. He explains that the biblical text implies that « the creatures which are endowed with intellect should praise Him on their own behalf and on behalf of the other creatures ».

In addition to these interpretations, David Qimhi observes that the arrangement of the verses in Psalm 148, apart from reproducing the Aristotelian cosmos, is parallel to the process of Creation described in Genesis 1. According to David Qimhi's explanation of Gen 1:1, the word *heavens* in the expression *God created the heavens and the earth* refers to the creation of the nine spheres of the constellations of the Zodiac and the planets, which were created on the first day of Creation. Following Maimonides, as he himself affirms, Qimhi sustains that the word *earth* alludes to the four physical elements which were also created on the first day.<sup>65</sup> In the second verse of Genesis, *the earth was a formless void and darkness covered the face of the deep, while a wind from God swept over the face of the waters*, all the elements – except the earth, which is mentioned first – appear in the biblical verse in correspondence with their natural order: the *darkness* which *covered the face of the deep* alludes to the fire, which is like darkness for it sheds no light; the *wind of God* is the air, and the *waters* over whose face the wind swept is elemental water.

In the case of Psalm 148, Qimhi observes that human beings are placed last in the psalm, because they were the last to be created, « as an indication that human beings are to rule over all,

<sup>65</sup> On Maimonides's interpretation of the account of Creation, see MOSES MAIMONIDES, *Guide* 2:30, trans. PINES, p. 348–359.

since they are the highest complex according to nature ». He also explains that *the waters above the heavens* (Psalm 148:4) and *all ocean depths* (Psalm 148:7) allude to the waters above the dry land and the waters below the earth (Genesis 1:7). He adds that the former are mentioned first because they were created first according to the account of Creation.

This is not the only instance where David Qimhi explains a biblical passage according to Aristotelian cosmology. In his comments on the famous episode of Elijah's ascension to heaven (2 Kings 2), Qimhi explains that Elijah went up to heaven passing through the spheres of air and fire. It was in the sphere of fire where his body was consumed and his clothes – except his mantle – were burned. He goes on to say that, as such, only Elijah's spirit continued on to heaven.

### VI. Menahem ha-Meiri

Menahem ben Solomon ha-Meiri wrote his *Commentary on Psalms* at the end of his life, between 1300 and 1315. In this commentary, as well as in his other works, Meiri frequently cites Abraham ibn Ezra and David Qimhi's interpretations. He usually cites them anonymously with the expression « there are those who explain ». In his comments on Psalm 22:17, Menahem ha-Meiri reproduces David Qimhi's comments on this same verse almost verbatim.<sup>66</sup> In his comments on Psalm 16, Menahem ha-Meiri cites, in the name of other exegetes, that מזמור נכבד ומעוטר « this is an important and crowned Psalm », which is precisely Ibn Ezra's opinion of this Psalm. He also coincides with Ibn Ezra in considering that Psalm 19 נכבד מאד « is a very important Psalm ». <sup>67</sup> He sometimes calls Ibn Ezra 'abi ha-'ezari « the father of my help », as in his comments on Psalms 119:126 and in his *Book of Repentance*.

Menahem ha-Meiri describes Psalm 148 as שבח והודאה לאל על חדוש העולם, והמשך « a praise and thanksgiving to God for having created the world, for the continuation of existence, and for having chosen us as His treasured people ». <sup>68</sup> In the case of the *angels*, he identifies them with הצורות « the separate forms », a formulation that clearly follows Qimhi's identification of the angels as « intellects separate from matter ».

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<sup>66</sup> For the Hebrew text of Menahem ha-Meiri's commentary on Psalm 22:17, see COHEN, *Haketer: Psalms*, vol. I, p. 71. For an English translation of Meiri's comments, see GREGG STERN, *Philosophy and Rabbinic Culture: Jewish Interpretation and Controversy in Medieval Languedoc*, Routledge, London-New York 2009, p. 59. On the influence of David Qimhi on Meiri's commentary on Psalms, see YEHUDAH FRIES-HOREV, « He-'Arot la-Perush ha-Me'iri 'al ha-Tehilim », *Kiryat Sefer*, 14 (1937), p. 16–20, and JOSEPH STEIN, « Zu Meiris Psalmenkommentar », *MGWJ*, 82 (1938), p. 46–56, esp. p. 49–50.

<sup>67</sup> COHEN, *Haketer: Psalms*, vol. I, p. 43 and 57.

<sup>68</sup> For the Hebrew text of Menahem ha-Meiri's commentary on Psalm 148, see COHEN, *Haketer: Psalms*, vol. II, p. 241–245.

Abraham ibn Ezra's definition of the *angels* of Psalm 148:2 as those beings not endowed with bodies paved the way for their identification with the separate intellects by David Qimhi and with the separate forms by Menahem ha-Meiri.

According to Menahem ha-Meiri, *all his hosts* are the stars in the eighth sphere, and the *stars of light* are the planets. Apart from the sun and the moon explicitly mentioned in verse 3, Meiri mentions the names of the other five, although not in the order in which they were known in medieval times: Mercury, Jupiter, Mars, Venus and Saturn.

Menahem ha-Meiri identifies the *heaven of heavens* in verse 4 with חלק האויר « the part of the upper air », meaning to say the sphere of air, as opposed to the atmosphere, which can be considered the 'lower air'. In this case, Meiri deviates from Ibn Ezra and Qimhi, who identify the *heaven of heavens* with the sphere of fire. The *waters that are above the heavens* are explained by Meiri as החלק האמצעי ממנו, אשר בו יכלה הניצוץ, ויפעלו בו המים « the part between them [*the heavens*] where the rays are extinguished and water is formed ». In this identification, he coincides with both Ibn Ezra and Qimhi. As in the case of Ibn Ezra, Meiri concludes that this is the limit of the superior beings.

Meiri's references to superior and inferior air resemble the terminology of *Ruah Hen*. In chapter seven, the author distinguishes three levels in the elemental air: the lower level, which is in contact with the earth, the intermediate level, and the upper level.<sup>69</sup> As has been demonstrated by Ofer Elijor, *Ruah Hen* was a well-known work in Provence in the thirteenth century. Elijor has analyzed the influence of *Ruah Hen* in Solomon ben Moses Melguiri, Gershon ben Solomon, and Menahem ha-Meiri's commentary on Proverbs 6:6–7.<sup>70</sup>

Meiri coincides with Qimhi, and not with Ibn Ezra, in interpreting the expression *He made them endure forever and ever* as meaning that God בראם בריאה קיימת « created them with a permanent creation », that is, they were created to be eternal. On *the order which shall not be broken*, he gives the same explanation as David Qimhi: לא ישתנה סדר מציאותם « their internal constitution is not subject to change ».

Regarding the lower beings, Menahem ha-Meiri observes in his comments on verse 8 that the intention of the Psalm is להזכיר ארבע היסודות, ולא על הסדר « to mention the four elements, but not in their natural order ». *Water* is alluded to by the expression *all sea monsters and ocean depths* (verse 7); after it, *fire* is explicitly mentioned in verse 8; then, *air* is alluded to by the words *hail and snow* (verse 8); next, *earth* is also alluded to by the expression *mountains and all hills* (verse 9). Meiri concludes that the reason that the Psalm refers to the four elements in

<sup>69</sup> OFER ELIJOR, *A Spirit of Grace*, p. 253.

<sup>70</sup> On the influence of *Ruah Hen* in southern France, see Elijor's analysis in OFER ELIJOR, *A Spirit of Grace*, p. 62–76; on its influence in Menahem ha-Meiri's commentary on Proverbs, see p. 73–76.

connection with the lower beings is that הם חומר העולם התחתון « they are the matter of the lower world ».

Meiri's comments on the references to the four elements of nature in the text of Psalm 148 must be understood in the context of his opposition to the radical allegorization of the biblical text. In a letter to Abba Mari, Meiri warns him against the extreme allegorization of some preachers who « allegorize as they please in Job, Proverbs, Song of Songs, Ecclesiastes, the Midrashim, the aggadot that are related to philosophic matters, and some of the Psalms that are related to physics ».<sup>71</sup> At the end of his commentary on Psalm 36, Meiri affirms that the allegorical interpretation of the Psalm as referring to the two worlds is not consistent with the literal meaning of the verses.<sup>72</sup> Aware of the risks of allegorical interpretation, Meiri tries to justify that the references to the elements of nature are based on the literal meaning of the biblical words. For this reason, he adds some brief notes to justify the connection between the literal and allegorical meanings: *all sea monsters and ocean depths* (verse 7) refer to *water* because the biblical text intends להפליג גודל הבריות אשר בתוכם « to emphasize the great size of the beings which live in it [water] »;<sup>73</sup> *fire* (verse 8) is explicitly mentioned to prove that it is « the superior fire », that is, elemental fire alone; *hail and snow* (verse 8) refer to *air* because these natural phenomena occur in the air. Although not explicitly stated by Meiri, *mountains and all hills* (verse 9) and other similar natural phenomena refer to *earth* because that is what they are made of.

However, Meiri then admits the possibility that the biblical text is not alluding to the four elements, but to the actual natural phenomena that take place in them: that is, that the biblical words must be interpreted literally. If this is the case, the word *fire* in verse 8 refers to אש הברק המתהווה באויר « the fire of lightning that can be seen in the atmosphere [lit. air] », an observation already suggested by Ibn Ezra. Meiri adds this possibility to be consistent with the rabbinic interpretation of the passage in *Genesis Rabbah* 12:11, which he quotes at the end of his comments on verse 8:

אמרו רבותינו: רבי אליעזר אומר: כל דבר שבארץ, אין ברייתו אלא מן הארץ, כדכתיב "הללו את יי מן הארץ" (תהלים קמח,ז). **אש וברד** וכו', כלומר: דבר שבארץ, שיורד בארץ, אע"פ שיורד מלמעלה. ועוד חזקו הענין רב הונא בשם רב יוסף: כל דבר שבשמים ובארץ, רוצה לומר, שהוא בשניהם, אין ברייתו אלא מן הארץ. ופירוש 'בשמים' באויר, ו'בארץ' שיורד לארץ, כדכתיב "כי כאשר ירד הגשם והשלג מן השמים" (ישעיה נה,י), והם אינם יורדים אלא מן האויר.

<sup>71</sup> STERN, *Philosophy and Rabbinic Culture*, p. 128.

<sup>72</sup> COHEN, *Haketer: Psalms*, vol. I, p. 115.

<sup>73</sup> Meiri explains the word *tanninim* as « the biggest fish » and *tehomot* as « watery depths, where dryness by drought and burning does not reach ».

Our sages said: « Rabbi Eliezer said: all that is on earth was created out of earth, as it is written, *Praise the Lord from the earth* (Ps. 148:7) ». <sup>74</sup> *Fire and hail, snow and smoke* are things which happen in the earth, and which come down to the earth from above. This idea was stressed by R. Huna in R. Joseph's name: « all that is in heaven and on the earth » – that is, all that happens in both places – « was created from the earth alone ». <sup>75</sup> *In heaven* means 'in the atmosphere' and *on the earth* means 'that which falls on the earth', as it is written, *for as the rain and the snow come down from heaven* (Isa. 55:10), because they come down from the atmosphere. <sup>76</sup>

In his definition of the term *qitor* 'smoke', Menahem ha-Meiri expands the definitions given by Ibn Ezra and David Qimhi – based on Aristotle's *Meteorology* – by using Aristotle's definition explicitly: בהתהפכות הניצוץ, בזה האיד היבש העולה מן הארץ, עם האיד הלה עם חלק אחד מן האויר, ויתהוו ממנו הרוחות האיד היבש העולה מן הארץ, בזה האיד היבש העולה מן הארץ, עם האיד הלה עם חלק אחד מן האויר, ויתהוו ממנו הרוחות « smoke is the dry exhalation which rises from the earth, when the sunshine is reflected together with the moist exhalation in one of the areas of the air, and from which winds originate ». In this definition, Meiri combines several ideas expressed in Aristotle's *Meteorology*. He may have had access to this work in Samuel ibn Tibbon's Hebrew translation completed in 1210 with the title *Otot ha-Shamayim*. As proven by Halbertal, Meiri rejects Samuel ibn Tibbon's naturalistic explanation of the gathering of the waters (Gen. 1:9) in his *Hibbur ha-Teshuvah* as well as in his commentary on Psalm 95. In these texts, Meiri exhibits his opposition to the scientists who interpreted the gathering of the waters according to Aristotelian physics. On the contrary, he defends the creation of the world out of nothing and the idea that God changed the laws of nature so that the dry land would appear. In his comments on Psalm 104:2, however, Meiri closely follows Ibn Tibbon's terminology in his interpretation of the gathering of the waters according to Aristotle's *Meteorology*: the dry land appeared as the result of the action of the light that was created on the first day, which produced the evaporation of the waters and the formation of the firmament. <sup>77</sup> Meiri's explanations of Psalm 104:2

<sup>74</sup> *Gen.Rab.* 12:11.

<sup>75</sup> *Gen.Rab.* 12:11.

<sup>76</sup> COHEN, *Haketer: Psalms*, vol. 2, p. 243.

<sup>77</sup> MOSHE HALBERTAL, *Between Torah and Wisdom: Rabbi Menachem ha-Meiri and the Maimonidean Halakhists in Provence*, Magnes Press, Jerusalem 2001, p. 69–75 (Hebrew). On the issue of the gathering of the waters in medieval Jewish thought, see GAD FREUDENTHAL, « The *Gathering of the Water* as an Issue Differentiating Traditionalist and Naturalist Positions in 13th-Century Jewish Thought: Samuel Ibn Tibbon, Jacob Ben Sheshet, and Menahem Ha-Meiri », *Da'at*, 74–75 (2013), p. 267–298 (Hebrew). On Meiri's exegesis of Psalm 95 in his *Hibbur ha-Teshuvah*, see MENAHEM HA MEIRI, *Hibbur ha-Teshuvah*, ed. ABRAHAM SCHREIBER, Kedem, Jerusalem 1976, p. 336–337. On Meiri's comments on Psalms 95 and 104 in his commentary on Psalms, see COHEN, *Haketer: Psalms*, vol. II, p. 85–87 and 105–113.

following the terminology of Aristotelian *Meteorology* are very similar to those given for Psalm 148.

In his *Meteorology* (I:4), Aristotle explains that the exhalation « rising from the earth itself, which is dry, is like smoke »; the other kind of exhalation, called vapor, is that « which rises from the moisture contained in the earth and on its surface ». <sup>78</sup> In his translation, Samuel ibn Tibbon uses the term *qītor* to refer to the ‘dry and hot exhalation’, by contrast with the ‘moist exhalation’ or vapor. <sup>79</sup> It is interesting to note that, in his Hebrew translation of Jonah ibn Janah’s *Kitāb al-Uṣūl*, Judah ibn Tibbon connects the meaning of *qītor* in Ps. 148:8 with the smoke of the furnace of Gen. 19:28. <sup>80</sup>

That the cause of both kinds of exhalation is the action of the sunshine on the earth is affirmed in Ibn Tibbon’s translation: הארץ כשתתלהב לתנועת השמש עליה יעלו: וממנה מינים מן האידים האחד האד החם היבש כשלא יהיה בו שום ליחות, והאיד החם הלה כשיהיה בו קצת ליחות, והאד הקר הלה כשיהיו המים גוברים עליו « when the earth is heated by the motion of the sun, different kinds of exhalation rise. One is the hot dry exhalation when it contains no moisture; then there is the hot moist exhalation when it contains some moisture, and the cold moist exhalation when water is predominant ». <sup>81</sup> In another paragraph, we read: כשתקרב השמש יגיע חומה לארץ « when the sun approaches, its heat reaches the earth and warms it and from the earth rise both an exhalation of the moisture it contains and the hot dry exhalation ». <sup>82</sup>

Meiri’s definition also seems to point out the idea that these two kinds of exhalation have different areas in the air, as is found in Ibn Tibbon’s translation: the hot dry exhalation, which is called ‘smoke’ (*qītor*), יגיע עד למעלה מפני שהוא חם, ויבש « reaches the upper sphere since it is hot and dry »; by contrast, the moist exhalation reaches only the lower parts of the atmosphere; this last exhalation « is the one that changes into water and from it clouds are produced ». <sup>83</sup>

The idea that the dry exhalation is the cause of the winds is also found in Aristotle’s *Meteorology* (II:4). Aristotle affirms that the exhalation « in which moisture predominates is the source of rain, as we explained before, while the

<sup>78</sup> ARISTOTLE, *The Complete Works of Aristotle*, trans. JONATHAN BARNES, Princeton University Press, Princeton 1984, vol. I, p. 559.

<sup>79</sup> SAMUEL IBN TIBBON, *Otot ha-Shamayim: Samuel Ibn Tibbon’s Hebrew Version of Aristotle’s Meteorology*, ed. and trans. RESIANNE FONTAINE, Brill, Leiden–New York–Köln 1995, p. 20–21.

<sup>80</sup> JONAH IBN JANAH, *Sefer ha-Shorashim*, trans. JUDAH IBN TIBBON, ed. SAMUEL BACHER, Philo Press, Amsterdam 1969, p. 447. On the use of the term *qītor* by Judah, Samuel and Moses ibn Tibbon, see FONTAINE, « Tibbonide Terminology », p. 69–72.

<sup>81</sup> IBN TIBBON, *Otot ha-Shamayim*, p. 40–41.

<sup>82</sup> IBN TIBBON, *Otot ha-Shamayim*, p. 48–49.

<sup>83</sup> IBN TIBBON, *Otot ha-Shamayim*, p. 48–49.

dry one is the source and substance of all winds ». <sup>84</sup> In Ibn Tibbon's translation we read: ויעלו מן הארץ שני אידים: האחד מהם לח והוא חומר לגשמים ולמימות והאחר יבש והוא התחלת כל הרוחות « from the earth two exhalations rise: one of them moist – which serves as matter for rain and water – and the other one dry, which is the origin of all winds ». <sup>85</sup> Ibn Tibbon also adds: השמש כשזרח על הארץ יעלה ממנה איד יבש בנגבו אותם, והוא יהיה גוף הרוח והתחלתה ושרשה והמרה. ותשב הרוח בעבורו ותתעורר כשיעור העולה « when the sun shines on earth it makes the dry exhalation rise by drying up the earth, and this exhalation is the body of wind, its origin, its source and its matter. The wind blows because of this dry exhalation: it rises according to its large or small amount ». <sup>86</sup>

The reason Meiri connects the meaning of the dry exhalation or smoke with the formation of winds from it serves him to justify that the expression *stormy wind fulfilling His command* (verse 8) is mentioned in the context of all the natural phenomena occurring in the same area of the Aristotelian cosmos, namely, the air or atmosphere. The reason that it is called *stormy wind* and not simply *wind* implies the religious belief that winds ולהשחית, להפיל ולהעניש, « sometimes are sent by God as a punishment by destroying, ruining and throwing down ». Thus, Meiri's explanation of *stormy wind* is based on David Qimhi's comments.

The scientific interpretation of Psalm 148 is relevant in the case of Menahem ha-Meiri, because he was one of the defenders of the legitimacy of science and philosophy in Judaism in the famous Maimonidean controversy. In his view, Aristotle's natural philosophy was no stranger to Jewish culture, but rather a part of it, such that the teachings of Aristotle can be found in Scripture. <sup>87</sup>

## VII. Conclusion

In the history of medieval Jewish exegesis, very little attention was paid to analyzing Psalm 148 from a scientific perspective prior to Abraham ibn Ezra. Abraham ibn Daud, one of the first Aristotelian Jewish authors, was probably the first Jewish exegete to connect the Aristotelian cosmology with a specific verse of Psalm 148. However, since he did not write a commentary on the whole Psalm, we cannot be sure if he considered the rest of the biblical text as reflecting Aristotelian physics.

Abraham ibn Ezra seems to be the first Jewish biblical scholar to have written a systematic commentary on Psalm 148 from a scientific perspective. In his opinion, this Psalm alludes to scientific matters that can only be understood

<sup>84</sup> ARISTOTLE, *The Complete Works*, vol. I, p. 584.

<sup>85</sup> IBN TIBBON, *Otot ha-Shamayim*, p. 104–105.

<sup>86</sup> IBN TIBBON, *Otot ha-Shamayim*, p. 106–107.

<sup>87</sup> STERN, *Philosophy and Rabbinic Culture*, p. 115, 208, and 210.

through scientific knowledge. The biblical text of Psalm 148 describes the structure, composition and laws of the universe according to the principles of Aristotelian cosmology. Even the order of the verses of the Psalm and the beings mentioned in them are parallel to the heavenly beings in the Aristotelian cosmos. The four elements of the lower world – namely, fire, air, water and earth – are alluded to in the psalm in the same order in which they are found in nature. The definition of the smoke in verse 8 also follows Aristotelian natural laws as expressed in the *Meteorology*. He likewise provides scientific reasons to prove that the natural phenomena mentioned in Psalm 148:8 originate in the earth, although they are seen in heaven. Moreover, Ibn Ezra adapts the Aristotelian cosmos to meet the demands of biblical interpretation. Although the angels are not mentioned in the Aristotelian cosmos, Ibn Ezra includes them in the upper world since they are explicitly mentioned in the psalm, and because they are part of the medieval Aristotelian worldview as adopted by Jewish authors. He also includes the sphere of fire and the sphere of air in the upper world, whereas according to Aristotle they belong to the terrestrial region. Ibn Ezra may have derived his knowledge on Aristotelian cosmology from Ibn Sina's works, as well as from Abu Ma'shar's *Great Introduction to Astrology*.

Abraham ibn Ezra's scientific comments on Psalm 148 were the starting point for the future scientific analysis of this psalm by other medieval Jewish exegetes. This includes David Qimhi, who expanded on Ibn Ezra's comments by adding new explanations, probably drawn from both Maimonides and the *Ruah Hen*. Especially relevant is Qimhi's reference to Maimonides's theory of the desire of the spheres: here, the angels of Psalm 148:2 are the separate intellects desired by the spheres.

In some of his explanations, Qimhi exactly reproduces Ibn Ezra's comments, but in other cases he reinterprets Ibn Ezra's words by adding more details. In one case, Qimhi may even misinterpret Ibn Ezra's explanation: Qimhi thought that Ibn Ezra identified the *waters that are above the heavens* (Psalm 148:4) with the sphere of water in the Aristotelian cosmos, whereas Ibn Ezra actually identified them with the sphere of air where water sometimes forms. Qimhi objects to the idea that a sphere of permanent water really exists.

David Qimhi also observes that the arrangement of the verses of Psalm 148 is parallel to the process of Creation as it appears in Genesis 1. This idea, which was only alluded to by Ibn Ezra, is expanded upon in Qimhi's comments.

Menahem ha-Meiri's exegesis of Psalm 148 is in fact a reinterpretation of both Ibn Ezra and Qimhi's comments. However, unlike his predecessors, Meiri justifies the references to the four Aristotelian elements of nature in the psalm by explaining the close connection between the literal and the allegorical meaning of the biblical words, reducing the allegorical interpretation to a minimum. Meiri's naturalistic interpretation of the natural phenomena mentioned in verse

8 reproduces the naturalistic theories on the different kinds of exhalation in Aristotle's *Meteorology*. He may have had access to this work through Samuel ibn Tibbon's translation, entitled *'Otot ha-Shamayim*.

By using Aristotelian cosmology, Abraham ibn Ezra, David Qimhi and Menahem ha-Meiri tried to find logical reasons to explain why certain beings appear in a specific order in Psalm 148. An evolution in the use of more naturalistic explanations can be observed in the interpretations of these three exegetes.

Abraham ibn Ezra's scientific comments on Psalm 148, probably derived from Aristotelian sources such as Ibn Sina's works and Abu Ma'shar's *Great Introduction to Astrology*, contributed to the process of transmission of Aristotelian science to the Jews of France. David Qimhi and Menahem ha-Meiri both continued down this trail blazed by Ibn Ezra, supplementing the information taken from Ibn Ezra with additional Aristotelian sources, such as Maimonides's *Guide of the Perplexed* and the *Ruah Hen*.

This analysis also reinforces the idea expressed by Tamas Visi that in the thirteenth century Ibn Ezra was received as part of Maimonideanism. The reception of Ibn Ezra and Maimonides by the first post-Maimonidean philosophers and exegetes was closely connected.<sup>88</sup> In the case of Psalm 148, the fact that Ibn Ezra used Aristotelian ideas in his exegesis in a similar way to those of Maimonides in his *Guide of the Perplexed* contributed to what has been called 'the Maimonidean appropriation of Ibn Ezra'.

Eric Lawee has recently proven that the *Commentary on the Torah* by Rashi became a canonical text because, among other reasons, it attracted hundreds of interpretative glosses and because of its « capacity for sustaining ongoing reading and interpretation ». <sup>89</sup> Lawee compares the reception of the commentaries on the Torah by Rashi and Ibn Ezra to conclude that « the two works attracted more supercommentaries than any other expositions of the Torah ». <sup>90</sup> The relationship of David Qimhi and Menahem ha-Meiri to Abraham ibn Ezra must be understood in the context of Ibn Ezra's reception by his

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<sup>88</sup> TAMAS VISI, « Ibn Ezra, a Maimonidean Authority: The Evidence of the Early Ibn Ezra Supercommentaries », in JAMES T. ROBINSON (ed.), *The Cultures of Maimonideanism: New Approaches to the History of Jewish Thought*, Brill, Leiden 2009, p. 89–132.

<sup>89</sup> ERIC LAWEE, *Rashi's Commentary on the Torah: Canonization and Resistance in the Reception of a Jewish Classic*, Oxford University Press, Oxford 2019, p. 6.

<sup>90</sup> LAWEE, *Rashi's Commentary*, p. 237–250. On Ibn Ezra's supercommentaries, see URIEL SIMON, « Interpreting the Interpreter: Supercommentaries on Ibn Ezra's Commentaries », in ISADORE TWERSKY, JAY M. HARRIS (eds.), *Rabbi Abraham Ibn Ezra: Studies in the Writings of a Twelfth-Century Jewish Polymath*, Harvard University Press, Cambridge, MA-London 1993, p. 86–128; see also the more recent work by HOWARD KREISEL, OFER ELIOR, DAVID BEN-ZAZON, ELIEZER DAVIDOVICH, ORLY SHOSHAN (eds.), *Five Early Supercommentators on R. Abraham Ibn Ezra: The Earliest Supercommentaries on Ibn Ezra's Torah Commentary*, Ben-Gurion University of the Negev Press, Beer-Sheva 2017.

medieval supercommentators. Qimhi and Meiri acted in the manner of Ibn Ezra's supercommentators, and appreciated Ibn Ezra's secret meaning of Psalm 148 and the connections he drew between the biblical text and Aristotelian science. In this sense, Qimhi and Meiri's scientific explanations of this Psalm can be considered as supercommentaries which expand, develop or in some cases even refute Ibn Ezra's comments.

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