

A *Figura* of the Soul: Visualizing the Three Faculties of the Soul in a Hebrew Manuscript

Sivan Gottlieb | ORCID: 0000-0002-5696-5173 Marie Skłodowska-Curie Actions European Postdoctoral Fellow, Department of Semitic Studies, University of Granada, Spain Art History Department, The Hebrew University of Jerusalem, Jersualem, Israel sivangottlieb@ugr.es; sivan.sadrines@mail.huji.ac.il

Received 31 July 2024 | Accepted 18 August 2024 | Published online 6 May 2025

Abstract

The headline "This figure is drawn to show all the faculties of the soul" introduces a diagram in a fifteenth-century Hebrew manuscript from Italy (Cambridge MS Dd.10.68). This distinctive composition, echoed in only one similar example, synthesizes textual and visual sources about the soul and the brain. Diverging from conventional medieval diagrams, this form highlights the innovative spirit of its creator. This article analyzes the integrated text, its sources, and the form of the diagram, shedding light on the practice of transforming a written text into an elegant visual representation, seamlessly merging the fields of medicine and philosophy.

Keywords

medieval Hebrew diagrams – visual knowledge – epistemic image – body and soul – brain ventricles – medieval medicine and philosophy

1 The Diagram as a Visual Repository of Knowledge

There is no clear scholarly consensus on the definition of a diagram. In his article on imaginative modeling, James Franklin, a mathematician by training,

defines a diagram as "a picture, in which one is intended to perform inference about the thing pictured, by mentally following around the parts of the diagram."¹ Faith Wallis, a historian of medieval Europe, elaborated several definitions of diagrams and stated, "a diagram is, in a number of ways, a visual text."² The art historians Jeffrey F. Hamburger and Adam S. Cohen further highlight the difficulties associated with defining medieval diagrams.³ Yet all these approaches agree on a basic premise that throughout history, diagrams have been employed as tools to aid the comprehension of texts and as mnemonic devices.⁴ Their primary function is to present complex information in a simplified visual format to aid understanding.⁵ In the medieval period, especially from the ninth to the twelfth century, diagrams became increasingly common in scientific works. It is widely agreed that the roots of medieval diagramming can be traced to scientific illustrations, which were used, mainly from the eleventh century, to convey and combine concepts.⁶

Medieval diagrams came in a variety of shapes and types. Circular or wheel diagrams, along with tree diagrams, for instance, were frequently used in medieval manuscripts to organize and present specific categories and typologies of

¹ James Franklin, "Diagrammatic Reasoning and Modelling in the Imagination: The Secret Weapons of the Scientific Revolution," in *1543 and All That*, ed. Guy Freeland and Anthony Corones (Dordrecht: Kluwer Academic Publishers, 2000), 55.

² Faith Wallis, "What a Medieval Diagram Shows: A Case Study of *Computus*," *Studies in Iconography* 36 (2015): 3. For more on the definition of medieval diagrams, see, for example, Michael Evans, "The Geometry of the Mind," *Architectural Association Quarterly* 12 (1980): 32–55.

³ Adam S. Cohen, "Diagramming the Diagrammatic: Twelfth-century Europe," in *The Visualization of Knowledge in Medieval and Early Modern Europe*, ed. Marcia Kupfer, Adam Cohen, and Jeffrey H. Chajes (Turnhout: Brepols, 2020), 383–384; Jeffrey F. Hamburger, "Mindmapping: The Diagram Paradigm in Medieval Art – and Beyond," in *The Visualization of Knowledge in Medieval and Early Modern Europe*, ed. Marcia Kupfer, Adam Cohen, and Jeffrey H. Chajes (Turnhout: Brepols, 2020), 64.

⁴ John E. Murdoch, Antiquity and the Middle Ages, Album of Science (New York: Charles Scribner's Sons, 1984), 113; Mary J. Carruthers, The Book of Memory: A Study of Memory in Medieval Culture (Cambridge: Cambridge University Press, 1992), 325. For further reading on medieval diagrams, see Jeffrey F. Hamburger, David J. Roxburgh, and Linda Safran, eds., The Diagram as Paradigm: Cross-Cultural Approaches (Washington, DC: Dumbarton Oaks Research Library and Collection, 2022).

⁵ Bianca Kühnel, "Carolingian Diagrams, Images of the Invisible," in *Seeing the Invisible in Late Antiquity and the Early Middle Ages*, ed. Giselle de Nie, Karl F. Morrison, and Marco Mostert (Turnhout: Brepols, 2005), 359.

⁶ Anne Marigold Norbye, "*Arbor Genealogiae*: Manifestations of the Tree in French Royal Genealogies," in *The Tree: Symbol, Allegory, and Mnemonic Device in Medieval Art and Thought*, ed. Pippa Salonius and Andrea Worm (Turnhout: Brepols, 2014), 70; Wallis, "What a Medieval Diagram Shows," 2.

knowledge.⁷ The types of visual aids that accompanied early scientific writings included tabulated information, dichotomies and *arbores*, *rotae* and circular diagrams, squares of opposition, mnemotechnic devices, and symbolic notation, some of which were depicted as artistic miniatures.⁸

Diagrams are also ubiquitous in medieval Hebrew manuscripts. While considerable research has been conducted on the translation of scientific texts from Latin and Arabic into Hebrew, less attention has been paid to the visual elements of these works. This study will focus on an intriguing diagram found in a fifteenth-century Hebrew manuscript copied in Italy and held today at Cambridge University Library (Ms Dd.10.68; henceforth "the Cambridge Hebrew manuscript"). I will discuss the diagram that takes up the entirety of fol. 239v (Fig. 1) and analyze both the text and the form of this diagram in order to deepen our understanding of how scientific visual knowledge was transmitted and disseminated in late medieval Jewish society.

Wallis observes that "many medievalists, it seems, know a diagram when they see one; but few are prepared to agree on what qualifies as a diagram and why."9 While it is easy to identify this diagram as a diagram, there is something particularly intriguing about its manner of visual representation compared to other medieval diagrams. Unlike circular or treelike diagrams, it has a single starting point in the middle of the folio that then splits into three distinct parts. It contains both the central node of a wheel diagram and the hierarchical branching structure of a tree diagram, thus integrating two types of diagrammatic representation. Its distinctive form may be closer to what readers today would call a "mind map." The diagram illustrates both the soul and the structure of the brain, and I will argue that it amalgamates several textual components and combines the realms of medicine and philosophy into a self-contained entity that stands on its own in the manuscript, rather than accompanying any specific text. This diagram, I will posit, functions as an "epistemic image" – a visual form that was created expressly for the purpose of accompanying the text, or, as in this diagram, even replacing verbal content in the form of a continuous text.¹⁰ I will also demonstrate that it is anchored in

⁷ Murdoch, *Antiquity and the Middle Ages*, 19; Jeffrey H. Chajes, "Kabbalistic Diagram as Epistemic Image," *Pe'amim* 150–152 (2018): 236, 240 [Hebrew].

⁸ See the images collected in Murdoch, *Antiquity and the Middle Ages*.

⁹ Wallis, "What a Medieval Diagram Shows," 1.

¹⁰ Christoph Lüthy, "Not What, but Why and How," in *What Is An Image?*, ed. Maja Naef and James Elkins (University Park, PA: Penn State University Press, 2011), 183; Chajes, "Kabbalistic Diagram as Epistemic Image," 241.



FIGURE 1 A fifteenth-century diagram of the three faculties of the soul from Italy, inscribed in the Cambridge Hebrew manuscript. Cambridge, University Library, MS Dd.10.68, fol. 239V REPRODUCED BY KIND PERMISSION OF THE SYNDICS OF CAMBRIDGE UNIVERSITY LIBRARY broader Jewish and non-Jewish textual and visual traditions, even as it charts its own unique visual language and presentational style.

In constructing my argument, I will first discuss the connection between medicine and philosophy as presented in the Cambridge Hebrew manuscript, highlighting the critical importance of these fields for understanding the diagram and its content. A detailed analysis of the diagram, including its possible source texts and form, will be embedded in a broader discussion of other relevant visual illustrations and images, which will in turn contribute to deepen our understanding of how scientific illustrations functioned in both Latin as well as Hebrew manuscripts. Detailed comparison of this diagram with another extant Hebrew diagram will allow me to identify points of contact and divergence underlining the multiplicity of ways in which these diagrams functioned as learning aids.¹¹ This article aims to bring these magnificent diagrams to light while recognizing the epistemic function of these images as new visual formats for the mediation of knowledge. At the same time, this article also foregrounds the importance of the use of the Hebrew language in the construction of these visual tools, and the innovative and discerning ways through which the scribes and authors sought, even in the Middle Ages, to approach their scientific subject matter.

2 The Cambridge Hebrew Manuscript: a Bridge between Medicine and Philosophy

The Cambridge Hebrew manuscript is an example of the interactions between medicine and philosophy, which were integrated subfields in medieval learned medicine.¹² This Hebrew illuminated manuscript was written on parchment (270/220 mm) and comprises 261 folios. The manuscript lacks a colophon,¹³ while the style of the script and the illustrations contained therein led scholars

¹¹ Since the Cambridge Hebrew diagram is part of the manuscript and is considered a part of the visual language of the scribe as a whole, I chose to focus on it. The other diagram was added to a seventeenth-century manuscript, as explained below.

¹² Interactions between rational medicine and natural philosophy emerged in ancient Greece. For more on the medicine-philosophy/body-soul connection, see Philip J. van der Eijk, Medicine and Philosophy in Classical Antiquity: Doctors and Philosophers on Nature, Soul, Health and Disease (Cambridge: Cambridge University Press, 2005); Elinor Liever, "Galen: Physician as Philosopher, Maimonides: Philosopher as Physician," Bulletin of the History of Medicine 53, no. 2 (1979): 268–285; Gerlad J. Grudzen, Medical Theory about the Body and the Soul in the Middle Ages (Lewiston, NY: Edwin Mellen Press, 2007).

¹³ The name "Shlomo" is inscribed about thirty-three times throughout the manuscript.

to assign it to Italy in the fifteenth century,¹⁴ north Italy at the end of the fourteenth century,¹⁵ or Padua before 1405.¹⁶ Within the manuscript, one can find a rich and heterogeneous collection of works covering the fields of medical health, with a focus on practical rather than theoretical medicine (preventive medicine, pharmacology, medical astrology, and magic), and a series of theoretical texts on philosophy.¹⁷ One such text is *A Spirit of Grace (Ruaḥ ḥen*). This treatise was originally written in Hebrew in the thirteenth century as an

15 Bezalel Narkiss and Anat Tcherikover, documentation of the "Cambridge Medical Miscellany," prepared in 1977 and 1979 for the publication of *Hebrew Illuminated Manuscripts in the British Isles – A Catalogue Raisonné*, Part Two, *The Italian Manuscripts* (unpublished; Part One was published in 1982). Jerusalem, The Center for Jewish Art Archive, Cat. 16, "Cambridge Medical Miscellany," 5–6.

16 Bezalel Narkiss, *Hebrew Illuminated Manuscripts* (Jerusalem: Keter, 1992), 169 [Hebrew].

17 In general, this manuscript includes the common treatises of the thirteenth and fourteenth centuries. However, these texts were probably not considered the canonical texts for learning medicine at the time. Rather, two earlier Hebrew records document the required treatises. One list was compiled by "Doeg the Edomite," who between 1197 and 1199 translated twenty-four medical treatises from Latin into Hebrew and divided these treatises into theoretical and practical works.

The list of "Doeg the Edomite"'s works appears in Paris, Bibliothèque Nationale, MS hébr. 1190, fols. 44–46r. On "Doeg the Edomite"'s translations, see Mauro Zonta, "Medieval Hebrew Translations of Philosophical and Scientific Texts. A Chronological Table," in Science in Medieval Jewish Cultures, ed. Gad Freudenthal (Cambridge: Cambridge University Press, 2011), 22–24; Gad Freudenthal, "The Father of the Latin-into-Hebrew Translations: 'Doeg the Edomite,' the Twelfth-Century Repentant Convert," in Latin-into-Hebrew: Texts and Studies, ed. Resianne Fontaine and Gad Freudenthal, 2 vols. (Leiden: Brill, 2013), 1:118-120. The second list was compiled by Shem Tov ibn Falaquera (c.1224-8c.1290-1), who in his Book of the Seeker advises his student to study medicine from several books, which he then enumerates. Carmen Caballero-Navas, "The Reception of Galen in Hebrew Medieval Scientific Writings," in Brill's Companion to the Reception of Galen, ed. Petros Bouras-Vallianatos and Barbara Zipser (Leiden: Brill, 2019), 542-543. Both lists refer to books by Hippocrates, Galen, Hunayn ibn Ishaq, Isaac Israeli, and al-Rāzī (Rhazes). Ibn Falaquera adds to the list the works of Ibn Sina (Avicenna), Ibn Rushd (Averroes), and al-Zahrawi (Abulcasis). The scribe of the Cambridge Hebrew manuscript did not include the treatises of these authors (except for Hippocrates's Aphorisms); however, these authors are mentioned by name throughout the manuscript, which testifies to their authority even in the fifteenth century. For additional literature on Jews and the medical profession, see, for example, Cecil Roth, "The Qualification of Jewish Physicians in the Middle Ages," Speculum 28, no. 4 (1953): 834-843; Nimrod Zinger, The Ba'al Shem and the Doctor (Haifa: Haifa University Press, 2017), 216–221 [Hebrew]; Joseph Shatzmiller, Jews, Medicine, and Medieval Society (Berkeley: University of California Press, 1994), 22-35.

¹⁴ Stefan C. Reif, *Hebrew Manuscripts at Cambridge University Library: A Description and Introduction* (Cambridge: Cambridge University Press, 1997), 344.

introduction to philosophy and theories of science in relation to Maimonides's *Guide for the Perplexed (Moreh Nevukhim*).¹⁸

The treatise *A Spirit of Grace* presents two distinct doctrines concerning the soul. One posits the existence of three souls: the vegetative, the sensitive, and the rational. This contrasts with the concept of a singular soul or entity with three parts, a perspective also embraced by the author.¹⁹ The diagram under discussion depicts the structure of a single tripartite soul, with the three parts understood as the powers or faculties of the soul. It appears at the end of the philosophical texts, followed by a blank folio, and illustrates an even more sophisticated integration between body and soul.

For the most part the manuscript is the product of a single hand, written in Italian non-square script, but several distinct textual units, comprised mainly of prognostications and predictions, were added later. These works were added on blank folios in the original manuscript by at least one Italian scribe different from the main scribe, between the end of the fifteenth century and the first three decades of the sixteenth century.²⁰ The main scribe used different forms of visual language to enhance the text, including initial-word panels, folio decorations, the diagram, and seven illuminated panels that are the highlights among the decorations. Four of the panels depict medical practices, one is an image that literally depicts the name of the treatise it accompanies, and two are representations of a teacher giving lessons to his two students.²¹

These illuminated panels create clear visual divisions in the manuscript, corresponding to specific thematic units. As I have argued elsewhere,²² the scribe of the Cambridge Hebrew manuscript edited his sources extensively – changing, adapting, and reformulating different texts into a single volume. His work indicates that he was an intellectual (likely a physician) who probably also designed the diagram under discussion and determined its unique placement at the end of the philosophical texts. Despite the luxurious quality of this

¹⁸ Ofer Elior, A Spirit of Grace Passed before My Face: Jews Reading Science, 1210–1896 (Jerusalem: Yad Izhak Ben-Zvi, 2016), 24 [Hebrew].

¹⁹ אל כן אמרו הראשונים כי האדם יש לו שלוש נפשות – הצומחת והמרגשת והמדברת. ועל Elior, Spirit of Grace, 243.

²⁰ This occurred in Italy at the end of the fifteenth century until 1530. I identified this with the generous help of Malachi Beit-Arié (5'') and Judith Schlanger.

²¹ Urine examination (fol. 2r); pulse examination (fol. 7v); pharmacist (fol. 37v); lesson (fol. 104r); bloodletting (fol. 211r); lesson (fol. 223r); man with an apple (fol. 234r). For the digital version of the manuscript, see https://cudl.lib.cam.ac.uk/view/MS-DD-00010-00068.

Sivan Gottlieb, "The Art of Medicine: Illuminated Hebrew Medical Manuscripts from the Late Middle Ages" (PhD diss., The Hebrew University of Jerusalem, 2021), 171–174 [Hebrew]; Sivan Gottlieb, "A Scribe's Luxury Manuscript: Text and Image in a Hebrew Medical Tract (Cambridge, University Library, Ms Dd.10.68)," *Manuscript Studies*, forthcoming.

manuscript, there is a distinct possibility that the scribe wrote it for his own use, in order to collate several Hebrew texts in one volume for easier reference.

3 The Diagram: a Textual and Visual Description

Questions regarding the nature of the soul formed a prominent subject in the philosophical texts that were chosen for inclusion in the Cambridge Hebrew manuscript.²³ The diagram, which stands on its own, without direct reference to any of the philosophical treatises that precede it, refers to the same subject – the philosophy of the soul – not in a textual format, as it originally circulated, but in an innovative form of visual diagrammatic language. The scribe's headline, "This figure is drawn in order to show all the faculties of the soul,"²⁴ establishes the subject matter, the medieval understanding of the soul's structure, at the outset, before we delve into the different units.²⁵ The diagram further constitutes a visual display of the faculties of the soul or its different components. However, as we will see, this diagram also incorporates references to anatomical and physiological knowledge regarding the three ventricles of the brain. Thus, it represents an integrated visual representation of the main areas of knowledge: the intellectual/spiritual, the sensory/emotive, and the physiological.

In what follows, I will translate the diagram (see also Fig. 2 and the appendix). While a diagram usually summarizes and simplifies complex subjects, the English translation here emphasizes the complexity of this particular example. The diagram includes twenty-eight circles of the same size, drawn in black ink. The reading of the diagram begins from the center, at the prominent and distinctively decorated circle labeled "the substance of the soul." On the left, outside the circle, there is an additional text, which has a decorated border on the left: "Aristotolo [Aristotle] defined the soul thus[:] the soul is a first existence

²³ A Spirit of Grace is followed by another treatise, The Book of Apple (Sefer Tapuaḥ). Next the reader encounters The Flowerbed of Planning and the Orchard of Wisdom (Arugat ha-Mezimah ye-Pardes ha-Hokhmah).

²⁴ The translations of the diagram text are mine, informed by the research literature and PESHAT database, unless otherwise noted.

²⁵ This practice is not unique. Lothar of Segni (ca. 1160–1216) used the opening *Haec figura demonstrat* (this figure demonstrates) in the forty-two diagrams accompanying his treatise on the Mass. The term *figura* was commonly used to designate diagrams. Hamburger, "Mindmapping," 64.



This figure is drawn in order to show all the faculties of the soul

FIGURE 2 English translation of the diagram of Cambridge, University Library, Ms Dd.10.68, fol. 239v

and entelechy of a natural organic body having life potentially.²⁶ Plato defines it in another way[:] the soul is a self-moving incorporeal substance." From the central circle flow lines leading to three other circles, similarly decorated but lacking the triangular points that distinguish the central one. These three circles represent the three faculties of the soul: the vegetative, the sensitive, and the rational. On the connecting lines linking these three circles to the central

²⁶ The translation of Aristotle's definition, "natural body having life potentially," is taken from Aristotle, *On the Soul*, ed. and trans. Jonathan Barnes (Princeton, NJ: Princeton University Press, 1984), 2.21 (412a27). The full definition reads: "The soul is an actuality of the first kind of a natural body having life potentially."





circle, the Hebrew word "its faculties" appears. From each of the three circles extend more lines leading to additional circles, which are all decorated with red ink. Each faculty is located in a different part of the folio.

The vegetative faculty (Fig. 3), on the right side, starts from the circle labeled "the nutritive faculty and also called the vegetative faculty." From this circle seven other circles branch off directly: "the attractive faculty" (nourishment to the body); "the retentive faculty" (of the same); "the digestive faculty"; "the repulsive faculty"; "the faculty that excretes the humors"/ "the excretory faculty"; "the procreative faculty," which branches off into two more, "the preparatory faculty" and "the formative faculty"; and "the faculty of growth."

The sensitive faculty (Fig. 4), at the upper part of the folio, starts from the circle labeled "the common sense and also called the internal emotion/passion." On the left side of it we find a vertical line with the text "the first ventricle" parallel to it. On the right side, the diagram branches off to include the



FIGURE 4 The sensitive faculty. Cambridge, University Library, MS Dd.10.68, fol. 239v (detail of Fig. 1)

five external senses and the parts of the body in which they are located; clockwise from the top, they are the "sense of sight in the eye"; "sense of hearing in the ear"; "sense of smell in the nose"; "sense of taste in the palate"; and "sense of touch in the whole body." The left side is dedicated to the internal senses. Horizontal lines connect the circle containing "the common sense" to another circle, "arbitrative faculty, and also called judicial faculty"; above it appears a vertical line and the text "the middle ventricle," and from this circle a line leads to another circle: "here are three faculties: the retentive, the memory, and that which evokes memory." Above this circle appears a vertical line and the words "the third ventricle." Under the first horizontal connecting line we find a comment citing the celebrated medieval Muslim scholar and philosopher Ibn Rushd, also known as Averroes (1126–1198): "this ventricle is in the front of the brain and has two faculties: the common sense and the imaginative faculty, according to the opinion of Averroes in the book *Sense and Sensibilia* [Epitome of Aristotle's *Parva Naturalia*]."

The rational faculty (Fig. 5), at the left, is represented by a circle labeled "the intellectual faculty and also called the rational faculty," which branches off into two circles. The circle to the left is labeled "and of it – the practical," and it branches off into two more circles: "the faculty to conceive something before doing it" and "the faculty to distinguish between good and evil." The



FIGURE 5 The rational faculty. Cambridge, University Library, MS Dd.10.68, fol. 239v (detail of Fig. 1)

lower circle is labeled "of it – the speculative/theoretical (*iyyuni*)" and is distinguished by decorative foliage. Certain features indicate that this circle precedes the practical circle; all the circles in the diagram are to be read from right-to-left or clockwise, and the word "and" appears in the practical circle, indicating that it is grouped with the speculative/theoretical circle. However, in some treatises, such as A Spirit of Grace, the practical faculty is listed first. From this lower circle, four other circles branch off: "the faculty by which one apprehends the primary intelligibles, as it is known without proof that the whole is greater than the sum of its parts"; "[the] faculty to apprehend the secondary intelligibles, like things which require proof or demonstration to verify them and understand them, which are not known at the beginning of one's thought, like the primary intelligible, and are therefore called secondary intelligibles"; "[the] faculty which abstracts the forms from their matters, like the human form which is the intellect/reason, and through this faculty the human understands the intellect abstracted from its matter"; "[the] faculty of apprehending the separate forms, like the separate intellects, which are themselves separate and there is no necessity to abstract them." In each case the text continues outside the circles and is bordered by a vertical line.

As we have seen, the diagram starts in the middle of the folio and branches out in three directions.²⁷ The circles are decorated according to three levels. The most decorated central circle is the first level. The less decorated three circles representing the three faculties of the soul are the second level. The remaining plain circles comprise the third level, and they are decorated the same, except for one circle (labeled "of it - the speculative/theoretical") which has additional foliage decoration. It is possible to distinguish a fourth level in the hierarchy, in the two circles branching from the procreative faculty in the vegetative faculty, and in the circles branching from the practical and speculative/theoretical parts of the rational faculty, but these circles are not graphically distinguished from the circles of the third level. The texts outside the circles as well as the headline are accompanied by decorations in black ink. At first glance, this looks like a systematic decorative plan. As Wallis argues, however, "making a visual argument through a diagram does not always clarify the subject in the sense of simplifying it; indeed, it can mystify it, making it more complex and opaque but also deeper and more meaningful."²⁸ Nevertheless, the gap in this diagram between its graphic simplicity and its verbal complexity, as we will see, contributes to the clarification of its highly complex subject.

4 The Diagram: Textual Sources

Many medieval philosophical treatises dealt with the subject of the soul. I have not located a specific treatise that contains all the information presented in the diagram. The complexity of the diagram may be attributed to the combination of a variety of sources on an already complex subject. In order to construct the diagram, the author (i.e., the original creator) relied on one main source: the *Epitome/Compendium of Aristotle's "Parva Naturalia"* composed by Averroes. This book was translated from Arabic to Hebrew by Moses ibn Tibbon in Provence in 1254.²⁹ The book is referred to directly in the diagram by its Hebrew name (*Ha-Hush ye-ha-Muhash*).³⁰

²⁷ The creator of the diagram used calipers, and if we look closely we can see deletions and corrections attesting that the circles were drawn before the texts were inscribed.

²⁸ Wallis, "What a Medieval Diagram Shows," 3.

²⁹ Zonta, "Medieval Hebrew Translations," 31.

³⁰ החוש והמוחש. For the Hebrew edition of this book, see Averrois Cordubensis, *Compendia librorum Aristotelis qui Parva Naturalia Vocantur*, ed. Henricus Blumberg (Cambridge, MA: The Mediaeval Academy of America, 1954) [Hebrew].

The *Epitome* composed by Averroes has been copied in more than twentyfive Hebrew manuscripts, exerting a substantial influence on numerous other Hebrew philosophical works spanning from the fourteenth and fifteenth centuries to the seventeenth century. Notable examples include *The Gate of Heaven* (*Sha'ar ha-Shamayim*), an encyclopedic philosophical-scientific composition by Rabbi Gershom ben Shlomo from thirteenth-century southern France, and *The Book of the Soul (Sefer ha-Nefesh)* by Shem Tov ibn Falaquera, composed in the thirteenth century.³¹

It is somewhat more difficult to determine the precise sources associated with the works of Aristotle and Plato that the author references. Aristotle describes the soul as the form of the body, whereas Plato describes it as an independent being.³² Aristotle's definition of the soul could have been taken from the Hebrew translation of the Arabic *De anima* (*Sefer ha-Nefesh le-Aristo*),³³ completed by Zeraḥiah Ḥen in Italy in 1284. Alternatively, the author could have read the translation of Averroes's compendium or his middle commentary on *De anima*, completed by Moses ibn Tibbon in Provence in 1244 and 1261, respectively.³⁴ In his *Timaeus* and other works, Plato asserts that the soul exists without the body and has both eternal and mortal parts.³⁵ However, this treatise was not translated into Hebrew.³⁶

³¹ Averrois Cordubensis, Compendia, 5, 11.

³² Oliver Leaman, "Maimonides, the Soul and the Classical Tradition," in *The Afterlife of the Platonic Soul: Reflections of Platonic Psychology in the Monotheistic Religions*, ed. Maha El-Kaisy and John Dillon (Leiden: Brill, 2009), 163.

³³ ספר הנפש לאריסטו. For the Hebrew edition of this book, see Aristotle, On the Soul, trans. Menahem Luz (Haifa: Oranim, 1989) [Hebrew].

³⁴ An anonymous Italian translator rendered Thomas Aquinas's Latin commentary on Aristotle's *De Anima* into Hebrew before 1448; Averroes's long commentary on Aristotle's *De Anima* was translated before 1470 from Latin into Hebrew by an anonymous translator. In my opinion, the two translations are too late to be considered as sources for the diagram. There are also other translations dating to the mid-fifteenth century or later. Zonta, "Medieval Hebrew Translations," 30, 33, 38, 66, 67.

^{35 &}quot;Having taken the immortal origin of the soul, they proceeded next to encase it within a round mortal body and to give it the entire body as its vehicle." Plato, *Timaeus*, in *Plato: Complete Works*, ed. John M. Cooper (Indianapolis: Hackett Publishing Company), 1271 (69c).

³⁶ This treatise does not appear in Mauro Zonta's overview of medieval Hebrew translations of philosophical and scientific texts. Averroes's compendium of the *Republic*, in which Plato also draws correspondences between the soul and society, was translated in 1320–1321 by Samuel ben Judah of Marseilles. Zonta, "Medieval Hebrew Translations," 56.

Medieval Jewish thinkers were acquainted with Plato's ideas about the soul through other authors, although they regarded Aristotle as the most significant philosopher. For example, while Maimonides mentioned the *Timaeus* in the *Guide for the Perplexed* (II, 13), his letter to Samuel Ibn Tibbon emphasized that there is no necessity to read the works of other ancient philosophers besides Aristotle.³⁷ Subsequent commentators even challenged Plato's theory of the soul as incorrect.³⁸ Despite the emphasis on Aristotle's importance, Maimonides himself asserted that a full understanding of his teachings requires relying primarily on commentaries.³⁹ Prominent Jewish philosophers from the fourteenth and fifteenth centuries, such as Gersonides, Hasdai Crescas, and Abarbanel, encountered Aristotle's writings solely through the works of Averroes.⁴⁰ This demonstrates the vast intellectual influence of Aristotelian philosophy, mediated by Averroes, on Jewish scholars at the time.⁴¹ Given the earlier influence attributed to him, Averroes can be considered a crucial source for the diagram.

Both Plato's and Aristotle's definitions are explicitly repeated in Dominicus Gundissalinus's treatise titled *Tractatus de anima* (ca. 1110–ca. 1190). Gundissalinus wrote this treatise in Latin and included parts of the psychology of Ibn Sina, known as Avicenna (980–1037); an anonymous scribe completed a Hebrew translation of this work sometime in the first decades of the thirteenth century.⁴² Comparison of the Hebrew definitions with those in the

- 39 Harvey, "Did Maimonides' Letter," 53.
- 40 Averrois Cordubensis, *Compendia*, 10.

³⁷ Steven Harvey, "Did Maimonides' Letter to Samuel Ibn Tibbon Determine Which Philosophers Would Be Studied by Later Jewish Thinkers?," *Jewish Quarterly Review* 83, no. 1 (1992): 53. For further discussion of the letter, see, for example, Doron Forte, "Back to the Sources: Alternative Versions of Maimonides' Letter to Samuel Ibn Tibbon and Their Neglected Significance," *Jewish Studies Quarterly* 23, no. 1 (2016): 47–90.

³⁸ Tamás Visi, "Ibn Ezra, a Maimonidean Authority: The Evidence of the Early Ibn Ezra Supercommentaries," in *The Cultures of Maimonideanism: New Approaches to the History* of Jewish Thought, ed. James T. Robinson (Leiden: Brill, 2009), 112. For Ibn Ezra's Platonic theory of the three souls, see, for example, Aaron W. Hughes, "The Soul in Jewish Neoplatonism: A Case Study of Abraham ibn Ezra and Judah Halevi," in *The Afterlife of the Platonic Soul: Reflections of Platonic Psychology in the Monotheistic Religions*, ed. Maha El-Kaisy and John Dillon (Leiden: Brill, 2009), 143–161.

⁴¹ Lola Ferre, "Avicena Hebraico: La traducción del Canon de Medicina," *Miscelánea de Estudios Árabes y Hebraicos. Sección Hebreo* 52 (2003): 167, 169.

⁴² Yossef Schwartz, "The Medieval Hebrew Translations of Dominicus Gundissalinus," in *Latin-into-Hebrew: Texts and Studies*, ed. Resianne Fontaine and Gad Freudenthal, 2 vols. (Leiden: Brill, 2013), 2:20, 25–26.

diagram reveals certain similarities.⁴³ The definitions of Plato and Aristotle appear also in Isaac Israeli's (855–955) *Book of Definitions*.⁴⁴

The unique terminological clues presented in the diagram make it possible to identify other medieval sources that may have influenced the author. The term "the substance of the soul" appears in Ibn Falaquera's twenty-chapter treatise on psychology, *The Book of the Soul.*⁴⁵ This term also appears in the Hebrew translation of Gundissalinus.⁴⁶ The terms "the nutritive faculty and also called the vegetative faculty" in the second-level circle of the vegetative faculty can be found in *The Gate of Heaven.*⁴⁷ The terms "arbitrative," inscribed in the second ventricle in the diagram, and "the retentive," in the third ventricle,

- 44 הדבור בנפש אמר הפילוסוף הנפש היא עצם המשלים לגוף הטבעי אל החיים בכח ואמר אפלטון הנפש היא עצם מתחדש בגוף ובזו האחיזה תשיג בגופות והיא פועלת בהם; הוא אפלטון הנפש היא עצם מתחדש בגוף ובזו האחיזה תשיג בגופות והיא פועלת בהם; הוא Samuel M. Stern, "The Hebrew Versions of Isaac Israeli's Book of Definitions and Book on Spirit and Soul & Critical Editions," Aleph 17, no. 1 (2017): 51.
- 45 נעצם הנפש. Josepe, Torah and Sophia, 317. The terms "judge" and "the retentive, and the memory" appear also (בכח השומר והזוכר). Josepe, Torah and Sophia, 311. For an English translation, see Josepe, Torah and Sophia, 321–350.
- 46 או חלקיה או חלקיה גרגפש ר׳ או או חלקיה. Schwartz, "Dominicus Gundissalinus: Sefer hanefeš (Tractatus de anima)," 227.
- 47 הנקרא צומח. Gershom ben Solomon, *The Gate of Heaven* (Warsaw, 1877), 74 [Hebrew].

For an English translation, see Gershom ben Solomon, *The Gate of Heaven*, ed. and trans. Simon F. Bodenheimer (Jerusalem: Kiryath Sepher, 1953). Gershom ben Solomon quoted Gundissalinus's Hebrew translation in his work *The Gate of Heaven*. For the psychological section on the faculties of the soul, he drew also on other sources, including *A Spirit of Grace* and *Eight Chapters*. Schwartz, "The Medieval Hebrew Translations of Dominicus Gundissalinus," 23; Elior, *Spirit of Grace*, 70–71.

can be found in Averroes's *Epitome*.⁴⁸ As the text in the diagram has been concisely formulated to suit the diagram, it is difficult to identify these sources with absolute certainty. However, once again we can reaffirm the impact of Averroes on the diagram's author.

The diagram is predicated on the threefold division of the faculties of the soul, which is visually encoded in the three directions in which the text extends, starting from the center.⁴⁹ Another traditional portrayal of the soul, consisting of five distinct functions (the nutritive, the sensitive, the imaginative, the appetitive, and the rational), is commonly found in Aristotle's writings and followed by Maimonides in the first of his *Eight Chapters*; Shmuel ibn Tibbon completed his translation of the work in 1202 in southern France.⁵⁰ It is worth noting that another treatise by Maimonides is included in the manuscript.⁵¹ However, the author of the diagram takes a notably different stance, articulated in *A Spirit of Grace* (which, as noted, is one of the philosophical treatises included in the Cambridge Hebrew manuscript).

In the diagram, the vegetative faculty is also called the nutritive faculty, which takes precedence as the primary faculty. It is then complemented by seven supplementary faculties, one of which, the procreative faculty, is divided

⁴⁸ ובעבור שהיה המרגיש אמנם ירגיש תחלה, ואחר יצייר המצייר ואחר יברור הבורר ואחר יקבל השומר התחייב בהכרח שיהיה המצייר באופק המרגיש מן המוח. ואחר ילוה אליו המחשב רוצה לומר, הבורר, וזה במקום האמצעי ואחר ילוה אל המחשב הזוכר והשומר, וזה המחשב רוצה לומר, הבורר, וזה במקום האמצעי ואחר ילוה מפורסם ממקומות אלו הכוחות *dia*, 28.

Plato also divided the mortal soul into three parts. The appetitive is located in the midriff, and the rational soul resides in the head. Located between the midriff and the neck is a third part that is spiritual in nature. Aristole distinguishes between three types of souls found within living things: a "nutritive soul," a "sensitive soul," and a "rational soul." Aristotle delineated five distinct functions of the soul. In medieval Arabic texts, the three types of spirits are related to the Aristotelian distinction of the soul. As a result, the soul's nutritive faculty is mediated by the natural spirit, which resides in the liver and veins. The vital spirit is located in the heart, from which they are dispersed through arteries to animate the body. Sensory perception occurs through the sense organs and nerves leading to the front of the brain. Stewart Goetz and Charles Taliaferro, *A Brief History of the Soul* (New York: John Wiley & Sons, 2011), 15–16, 19; María José Ortúzar, "Ordering the Soul. Senses and Psychology in 13th Century Encyclopaedias," *RursuSpicae* 3 (2020): 8.

⁵⁰ Elior, Spirit of Grace, 70. For an English translation, see Maimonides, Eight Chapters of Maimonides on Ethics, trans. Joseph Gorfinkle (New York: AMS Press, 1912). In Eight Chapters we encounter Maimonides's Aristotelian method for addressing the unity of the body and soul. This concept constitutes the foundation of his moral theory and his psychological doctrine in general. Eliyahu Aviad, Guide to the Perplexities of the Soul (Jerusalem: Ministry of Education, Culture, and Sports, 2005), 50 [Hebrew].

⁵¹ The Cambridge Hebrew manuscript contains also *Mishneh Torah*, Sefer Madda^c, De^cot, ch.
4, fols. 18v–20v.

into the preparatory faculty and the formative faculty. The significance of two other circles (the faculty of growth and the procreative faculty) is secondary, as they do not seem to be drawn on the same line as the other seven circles but, rather, are arranged closer to the nutritive faculty. If this arrangement is intentional, this visual hierarchy reflects modifications and adjustments made to the sources. Several sources, such as A Spirit of Grace and the Hebrew translation of Gundissalinus, present the vegetative part of the soul as comprised of seven faculties, but they arrange them in a different hierarchy, grouping together three main faculties:⁵² the nutritive faculty, which is further divided into four parts; the faculty of growth; and the procreative faculty.⁵³ Neither of these sources mentions "the faculty that excretes the humors."⁵⁴ This faculty appears by name, together with the other faculties, in *Eight Chapters* and The Gate of Heaven. However, the diagram displays a different ordering of the circles: in the two treatises, growth is the fifth faculty, procreation is the sixth, and the faculty that excretes the humors is the seventh.⁵⁵ A second difference between the diagram and the sources is the addition on the diagram of two faculties that emerge from the procreative faculty.56

- In *Eight Chapters*: "Let me say that the nutritive faculty consists of: (1) the power of attracting nourishment to the body, (2) the retention of the same, (3) its digestion (assimilation), (4) the repulsion of superfluities, (5) growth, (6) procreation, and (7) the differentiation of the nutritive juices that are necessary for sustenance from those which are to be expelled." Maimonides, *Eight Chapters*, 40. In *The Gate of Heaven*: "We say that the nutritive part is divided into the following forces: of attraction, retention, digestion, and expulsion of the surpluses, of growth and (of recognition), of reproduction which (later) separates to moisture into those parts, fit for nutrition and fit for excretion. All these seven forces are comprised by the nutritive force." Gershon ben Solomon, *Gate of Heaven*, 312.
- 56 There are references to different procreative actions in Gundissalinus's Hebrew translation, but they are not named: והמוליד הוא בו חלק מן הגוף אשר הוא בו חלק דמות ההשלמה והויה דומה לו בכח ובפועל בחלק להוציא גוף אחר. והכח ההוא נותן לחלק דמות ההשלמה והויה לזמה לו בכח ובפועל בחלק להוציא גוף אחר. והכח ההוא נותן לחלק דמות ההשלמה והויה מזוma)," 257. According to the *PESHAT* website, the term "formative faculty" appears also in the treatise *Microcosm* by Joseph ben Jacob ibn Saddiq, which was translated from Arabic, perhaps in Spain, in the thirteenth century. See "בֹח הַפְּעָצֵיך", in *PESHAT in Context: A Thesaurus of Pre-Modern Philosophic and Scientific Hebrew Terminology*, ed. Reimund Leicht and Giuseppe Veltri, https://peshat.org/display/peshat_lemmas_00050969 (accessed February 27, 2022); Zonta, "Medieval Hebrew Translations," 27. I did not find

⁵² In *Book of the Soul*, the division is also made according to the same three main powers; the vegetative faculties are three: nutrition, growth, and procreation. Josepe, *Torah and Sophia*, 326.

⁵³ For the Hebrew, see Elior, *Spirit of Grace*, 243.

⁵⁴ In Gundissalinus's Hebrew translation, this power is attributed to all others; however, the terminology is different. Schwartz, "Dominicus Gundissalinus: Sefer ha-nefeš (Tractatus de anima)," 257.

The rational faculty seems to derive also from the sources mentioned above. According to *Eight Chapters*, "reason, that faculty peculiar to man, enables him to understand, reflect, acquire knowledge of the sciences, and to discriminate between proper and improper actions. Its functions are partly practical and partly speculative."⁵⁷ The four circles at the bottom left of the diagram correspond to the four degrees of this function, which appear in both *A Spirit of Grace* and *The Gate of Heaven* with only slight changes. In relation to the visual language, the circle in the rational faculty named "of it – the speculative/theoretical" is differentiated from the others by the addition of a delicate black line of foliage decoration, which emphasizes its importance. This is the highest level of the faculties; this is the real value of life and the true purpose of the human being, which is to develop the mind by pursuing a life of study.

The sensitive faculty also combines several sources and even two different kinds of information, which we can classify as psychical and anatomical-physiological elements. This faculty was believed to be responsible for the brain's cognitive processes, according to medieval tradition.⁵⁸ The information inside the circles concerns the external and internal senses, and the information added outside the circles indicates locations within the brain. This is a critical point. The author merged two areas of knowledge in this section, using the visual language for this purpose. The part on the left, which deals with practices and the ventricles of the brain, is connected to the common sense circle not by tapering rays but by rectilinear paths, different from all the other

the term כה המכין (preparatory faculty) in these sources. Moses of Narbonne in his treatise identifies two parts of the procreative power: one is formative and one is in the sperm (שהכי בעצמו המצייר [...] האחר ר״ל הכוח אשר בזרע). Moses of Narbonne, Treatise on the Perfection of the Soul, 54. The term "formative faculty" appears in Maimonides's Medical Aphorisms. The terms "the retentive" and "the memory" also appear in this treatise. והכח אשר יתן תבנית ותכונה לאותו חומר עד שמשים אותו עצם בשיעור כך ובצורת כד וכד בשאר אברים המתדמים החלקים הוא הנקרא הכח המצייר; אמר משה [...] שהכח השומר והוא הזוכר. Maimonides, Medical Aphorisms (Vilna, 1888), 4, 7 [Hebrew]. English translation: "And the faculty that gives shape to that material so that it can make a certain bone with a certain size and form, and similarly the other homogeneous parts, is called the formative faculty." Maimonides, Medical Aphorisms, ed. and trans. Gerrit Bos (Leiden: Brill, 2021), 159. The term "formative faculty" also appears in Averroes's *Epitome* (see n. 48 above), but as in Maimonides it seems that it is considered part of the imaginative faculty. However, "formative" is a basic term in Averroes's theory of procreation; see Gad Freudenthal, "The Medieval Astrologization of Aristotle's Biology: Averroes on the Role of the Celestial Bodies in the Generation of Animate Beings," Arabic Sciences and Philosophy 12 (2002): 111-137.

⁵⁷ Maimonides, Eight Chapters, 43.

⁵⁸ Simon Kemp, Cognitive Psychology in the Middle Ages (Westport, CT: Greenwood Press, 1996), 45.

circles. As I will explain below, this type of depiction of visual connection is rooted in an already established diagrammatic tradition.

The right part of the sensitive faculty in the diagram is dedicated to the external senses (although it does not use that term). The order of the five senses in the diagram – with sight at the top and then hearing, smell, taste and touch – is in accord with various texts that identify sight as the supreme sense and as the primary instrument of knowledge.⁵⁹ In the diagram, the external senses are linked to the common sense circle labeled "the first ventricle," indicating their connection to the brain at this particular point. The connection of the five external senses with the brain is described in *A Spirit of Grace* and in *The Gate of Heaven* as follows: "the brain is the starting point of all sensations: from there do they go out and thither they return."⁶⁰ To be more precise, nerves originate in the brain, and the sensory nerves are connected to the first ventricle, as described by Galen.⁶¹

This approach to the brain is unlike that of Aristotle, who maintained that the heart was the central sense organ of the body, where the five senses coalesced via a network of blood vessels.⁶² Already in the treatise *The Gate of Heaven*, the debate between the superiority of the heart versus the brain as the origin of bodily sensations is addressed directly.⁶³ This represents yet another significant deviation between the author's perspective and that of Aristotle with respect to the threefold division of the faculties of the soul. The author leans toward a medical perspective on the soul influenced by physicians and anatomists like Galen, instead of Aristotle's more theoretical and philosophical approach.⁶⁴

The left part of the sensitive faculty in the diagram is dedicated to the internal senses. The term "internal senses" appears in Arabic and Hebrew philosophical

⁵⁹ Martina Bagnoli, ed., *A Feast for the Senses: Art and Experience in Medieval Europe* (New Haven, CT: Yale University Press, 2016): 17–18.

⁶⁰ Gershon ben Solomon, *Gate of Heaven*, 314. For the Hebrew text in *A Spirit of Grace*, see Elior, *Spirit of Grace*, 243.

⁶¹ Kemp, Cognitive Psychology, 46; Julius Rocca, Galen on the Brain (Leiden: Brill, 2003), 52.

Pavel Gregoric, Aristotle on the Common Sense (Oxford: Oxford University Press, 2007),
 43, 46.

^{63 &}quot;The force of sensation has its special organ which is the brain according to the Physicians, or the heart according to Aristotle." Gershon ben Solomon, *Gate of Heaven*, 313.

⁶⁴ For additional reading about the debate, see, for example, Walter Pagel, "Medieval and Renaissance Contributions to Knowledge of the Brain and Its Functions," in *The History* and Philosophy of Knowledge of the Brain and Its Functions, ed. Frederick N. L. Poynter (Springfield, IL: Charles C. Thomas, 1958); Rocca, *Galen on the Brain*.

literature as a generic term that includes the post-sensory faculties.⁶⁵ The theory of internal senses, in its basic form, postulates three faculties of the brain: imagination, cognition, and memory. However, during the Middle Ages, this theory had several variations. Among them, Avicenna's proposal of five internal senses – common sense, imagination, fantasy, cogitative power/estimation, and memory – had the most significant impact.⁶⁶ While the diagram does not use the term "internal senses," it does introduce the concept of "internal emotion/internal passion" (*hergesh pnimi*) as an alternate name for "common sense." The term "the common sense" (*ha-hush ha-meshutaf*), which appears twice in the diagram, was in wide use among philosophers and refers to a kind of control center that weighs all senses together and creates mental images. These images were in turn analyzed and manipulated by cognitive processes and eventually stored in the memory.⁶⁷

The treatise *A Spirit of Grace* distinguishes between the external senses and the internal one. The latter is called "imagination" and is composed of three elements: perception and preservation; preservation and recollection; and the appetitive faculty.⁶⁸ However, the division of the ventricles that appears in the diagram is absent in this treatise. The assignment of the faculties to different locations in the brain, without using the term "ventricle" itself, is found in Averroes's *Epitome*.⁶⁹ In *The Book of the Soul*, the term "ventricle" is used, and there is a detailed discussion of the location of the faculties in these ventricles.⁷⁰ Gundissalinus, in the Hebrew translation, separated the sensitive

⁶⁵ In Aristotle's works, the general term "internal sense" does not appear. This term appears in *A Spirit of Grace*, together with the "imaginative power." For the Hebrew, see Elior, *Spirit* of Grace, 244.

⁶⁶ Annemieke Verboon, "Brain Ventricle Diagrams: A Century after Walther Sudhoff. New Manuscript Sources from the xvth Century," *Sudhoffs Archiv* 98, no. 2 (2014): 223, 225.

⁶⁷ Harry Austryn Wolfson, "The Internal Senses in Latin, Arabic, and Hebrew Philosophic Texts," *Harvard Theological Review* 28, no. 2 (1935): 69, 71–72; Mary J. Carruthers, *The Book* of Memory: A Study of Memory in Medieval Culture (Cambridge: Cambridge University Press, 1992), 63; Angel Gonzalez de Pablo, "The Medicine of the Soul. The Origin and Development of Thought on the Soul, Diseases of the Soul and their Treatment, in Medieval and Renaissance Medicine," *History of Psychiatry* 5, no. 20 (1994): 499; Kemp, *Cognitive Psychology*, 52; Harry Whitaker, "Was Medieval Cell Doctrine More Modern Than We Thought?," in *Consciousness and Cognition: Fragments of Mind and Brain*, ed. Henri Cohen and Brigitte Stemmer (London: Elsevier, 2007), 45.

⁶⁸ For the Hebrew, see Elior, *Spirit of Grace*, 244.

⁶⁹ See n. 48 above.

^{70 &}quot;One of the internal perceptive faculties is the common sense, which is a faculty arranged in the first ventricle of the brain. It receives by itself all the forms impressed upon the five senses and transmitted to it. After this is the imagination and informing (faculty), which is a faculty arranged at the end of the anterior ventricle of the brain [...] after this is the

soul into sensory perception and voluntary motion and then divided sensory perception into five external faculties as well as the internal faculties. He also placed the internal faculties in different regions of the brain. It is worth mentioning that the anonymous translator used Hebraized Latin or vernacular for the names of the internal faculties and rendered them in Hebrew script, yielding terms such as *eifantasia, eshtimativa,* and *memorbala.*⁷¹

The part of the diagram addressing the sensitive faculty of the soul illustrates one formulation of what historians refer to as the medieval cell doctrine, which is in fact a theory of cognition.⁷² Today it is well established that cognitive functions are located in different parts of the brain.⁷³ For centuries, it was commonly believed that the sense organs absorbed data. The data were then transformed into ideas and stored as memories. Moreover, it was believed that the three major stages of this sensory process took place in ventricles located in the head.⁷⁴ The activities of brain function and thinking were conceptualized as a sequence of digestion-like processes.⁷⁵ However, while medieval physicians and surgeons had a clear understanding of the location of major organs involved in digestion, they had less clarity regarding the number and specific location of the processes involved in cognition.⁷⁶ The consensus was that the

faculty called imagination in relation to the human soul; this faculty is close to the middle ventricle of the brain [...] after this is the faculty called *wahm* in Arabic. It is located at the end of the middle ventricle of the brain [...] after this is the faculty of retention and memory, which is a faculty located in the posterior ventricle of the brain." הפנימים המשיגים החוש המשתתף, והוא הכוח מסודר בחלל הראשון במוח, יקבל בעצמו כל הצורות המשיגים החוש המשתתף, והוא הכוח מסודר בחלל הראשון במוח, יקבל בעצמו כל הצורות הרשומות בחושים החמישה ויגיע אליו, ואחרי כן הדמיון והמצייר, והוא הכוח מסודר בסוף החלל המוקדם מהמוח ואחרי כן הכוח הנקרא מדמה בהקש אל הנפש האנושית, והוא כוח החלל המוקדם מהמוח ואחרי כן הכוח הנקרא מדמה בהקש אל הנפש האנושית, והוא כוח החלל המוקדם מהמוח ואחרי כן הכוח הנקרא מדמה בהקש אל הגפש האנושית, והוא כוח החלל המוקדם מהמוח ואחרי כן הכוח הנקרא מדמה בהקש אל הנפש האנושית, והוא כוח החלל המוקדם מהמוח ואחרי כן הכוח הנקרא מקצת מה שבדמיון כפי הבחירה. ואחר כן הכח הקרוב מחלל האמצעי, דרכו להרכיב ולפרק מקצת מה שבדמיון כפי הבחירה. ואחר כן הכוח החלל המוקדם מהחלל האמצעי, דרכו להרכיב ולפרק מקצת מה שבדמיון כפי הבחירה. ואחר כן הכח הנקרא מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר והזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר והזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר והזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר והזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר והזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר והזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כן הכח השומר הזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר הזוכר והזוכר והוא כח מוחשים הנמצאים במוחשים הפרטים בכח השופט. ואחר כך הכח השומר הזוכר הזוכ

- 71 See Schwartz, "Dominicus Gundissalinus: Sefer ha-nefeš (Tractatus de anima)," 261–271.
- 72 Murdoch, Antiquity and the Middle Ages, 325.
- 73 Whitaker, "Was Medieval Cell Doctrine More Modern Than We Thought?," 45.
- 74 Ynez Violé O'Neill, "Diagrams of the Medieval Brain: A Study in Cerebral Localization," in Iconography at the Crossroads, ed. Brendan Cassidy (Princeton, NJ: Princeton University Press, 1993), 91.
- 75 Pagel, "Medieval and Renaissance Contributions," 100.
- 76 In classical antiquity, there were attempts to identify and localize brain functions. Herophilus of Alexandria (*c*.300 BC) described the brain's four ventricles. Some regarded the fourth ventricle as the repository of the soul. It was then that the controversy began as to whether the soul was sited in the brain or in the heart. Galen claimed that the brain was the body's control center, and he made a more exact assignment of functions to specific parts of the brain following Herophilus and Erasistratus, but without reference to the location of the faculties. The brain's division into its faculties and the location of every faculty

brain contained three ventricles. The first ventricle included common sense; it integrated input from all five external senses and was capable of imagining perceived and remembered images. The second ventricle housed the capacity for abstraction, responsible for instinctive behavior, while the third contained the function of memory.⁷⁷ The diagram portrays the conceptual understanding and functioning of the senses, illustrating how all five external senses converge and connect to the circle of common sense within the sensitive faculty. There, one can discern five distinct processes. The first two ventricles house one ability each, while the final ventricle, associated with memory, contains three abilities.

The three abilities in the last ventricle – labeled "the retentive," "the memory," and "that which evokes memory" – can be related to Aristotle and Averroes's *Epitome*.⁷⁸ In the Aristotelian model there is a distinction between memory (*memoria*) and recollection (*reminiscentia*). The latter involves the body and is preoccupied with the search for certain memory-images, either to recover existing knowledge or to recall previous sensations.⁷⁹ In my view, the part referred to as "that which evokes memory" may correspond to the process of recollection.

5 Two Diagrams: Similarities, Differences, and Meanings

In many cases, in the surviving medieval texts, illustrations, and diagrams, we are dealing with copies of earlier manuscripts.⁸⁰ The act of copying therefore

in a ventricle were known in the fifth century CE, and the church fathers Augustine and Nemesius developed theories on the subject. However, a broad discussion of the different faculties and their location in the brain began only with Adelard of Bath (1080–1152), who described particular mental faculties of the head: the prow, imagination; the middle, reason; and the stern, memory. O'Neill, "Diagrams of the Medieval Brain," 91, 95; Edwin Clarke and Kenneth Dewhurst, *An Illustrated History of Brain Function* (Berkeley: University of California Press, 1972), 5, 10. See also Rocca, *Galen on the Brain*.

⁷⁷ Kemp, Cognitive Psychology, 52.

¹⁸ וההבדל בין הזכרונות והשמירה כי השמירה אמנם היא למה שלא יסור עומד בנפש מעת השגתו בזמן העובר עד הזמן העומד. ואולם הזכרונות הנה הוא למה שכבר שכח, ולכן היה השגתו בזמן העובר עד הזמן העומד. ואולם הזכרונות הנה הוא למה שכבר שכח, ולכן היה הזכרונות שמירה נפסקת והשמירה זכרונות מודבק, וזה הכוח אחד בנושא, שנים בצד. הנה הזכרונות בנלל הוא ידיעת מה שכבר נודע אחר שנפסקה ידיעתו, וההזדכרות הוא בקשת הזכרונו גת הידיעה כאשר לא נמצאת, ועשות המחשבה להעמידה. ומכות הזאת הידיעה כי הפעולה הזאת ראוי הזכרונות שמירה נפסקת והשמירה זכרונות מודבק, וזה הכוח אחד בנושא, שנים בצד. הנה הזכרונות שמירה נפסקת והשמירה זכרונות מודבק, וזה הכוח אחד בנושא, שנים בצד. הנה הזכרונות הזכרונות שמירה נפסקת הדיעתו, וההזדכרות הוא בקשת זכרונות הזאת ראוי הזאת הידיעה כאשר לא נמצאת, ועשות המחשבה להעמידה. ומבואר כי הפעולה הזאת ראוי זכר זאת הידיעה נפולה הזאת העריה לכח אינו חוש ולא דמיון והוא אשר יקרא זוכר

⁷⁹ Irene E. Zwiep, "Jewish Scholarship and Christian Tradition in Late-Medieval Catalonia: Profiat Duran on the Art of Memory," *Hebrew Scholarship and the Medieval World*, ed. Nicholas de Lange (Cambridge: Cambridge University Press, 2001), 229–230.

⁸⁰ Murdoch, Antiquity and the Middle Ages, x, 15.

enables historians to trace parallels between the textual and visual traditions of medieval Jews and Christians. Yet while the study of textual parallels has thrived, we are only beginning to discover the visual languages of Jewish scholars.

Medieval manuscripts contain more diagrams than is commonly acknowledged, but they are often challenging to locate due to limited information in catalog entries and their omission from codicological descriptions.⁸¹ Currently, only one Hebrew diagram similar to the one in the Cambridge Hebrew manuscript has been found (Fig. 6). This diagram appears in an Italian Hebrew manuscript from the seventeenth century (henceforth "the Guenzburg Hebrew manuscript").⁸² The manuscript includes various sermons; according to the National Library of Israel, two folios were added to it at the beginning, and the first one includes the diagram (fol. 1v). The Italian script of this diagram is earlier than that of the rest of the manuscript – it probably belongs to the fifteenth century.⁸³ In consequence, we do not know what other treatises were originally circulated with this diagram.

The Guenzburg Hebrew diagram bears a striking resemblance to the Cambridge Hebrew diagram. Nevertheless, there are several differences that one should consider. In terms of visual presentation, the central circle of the Guenzburg Hebrew diagram appears to be more prominently emphasized. The Cambridge Hebrew diagram, on the other hand, seems denser because of the close proximity of the three faculties of the soul. The difference in density is also due to the fact that all the additional text in the Guenzburg Hebrew diagram appears within frames. Black ink alone is used in the Guenzburg Hebrew diagram; the three faculties of the soul are similarly decorated, and some shapes are circles, some are leaflike, and some leaflike shapes end in what appears to be a fleur-de-lis. The practical and theoretical components of the rational faculty are arranged differently on the folio (the two divisions of the practical component are rising upward). The alleged hierarchy that exists in the Cambridge Hebrew diagram between the two circles of the vegetative faculty and the decorated circle of the rational faculty is not present in this diagram. However, the sensitive faculty was treated in the same manner and drawn along a rectalinear path.

⁸¹ Evans, "Geometry of the Mind," 35.

⁸² Moscow, The Russian State Library, MS Guenzburg 1056.

⁸³ I would like to thank Malachi Beit-Arie (۲۳ל) and Elena Lolli for their assistance in identifying the script and date.



FIGURE 6 A fifteenth-century diagram of the three faculties of the soul inscribed in the Guenzburg Hebrew manuscript. Moscow, The Russian State Library, MS Guenzburg 1056, fol. 1V THE IMAGE BELONGS TO THE COLLECTION OF THE RUSSIAN STATE LIBRARY

The textual differences are minimal.⁸⁴ The Cambridge Hebrew diagram uses the definite article (the prefix -¬), while the Guenzburg Hebrew diagram does not. In addition, the Guenzburg Hebrew diagram contains a detailed addition at the bottom of the folio. The additional text expands upon the three faculties of the third ventricle and mentions Averroes and his *Epitome* once again.⁸⁵ Notably, the Guenzburg Hebrew diagram lacks the explanatory head-line and definition of the soul according to Plato; only Aristotle's definition is presented. The absence of Plato's definition is not surprising; as noted above, Aristotle was the more influential authority on the soul. In light of this, a question arises: Why does the Cambridge Manuscript diagram include it? And can the absence or presence of this definition be helpful in more precisely dating the diagrams?

Although the two diagrams can be dated to the fifteenth century, the order in which they were created is uncertain. However, certain indications suggest that the Cambridge Hebrew diagram is the older of the two. These indications arise from a comprehensive examination of the manuscript as a whole, considering its innovative elements and its inclusion of *A Spirit of Grace*.⁸⁶ The diagram found on fol. 239v of the Cambridge Hebrew manuscript exhibits a deliberate design tailored to its specific placement within the manuscript, seamlessly integrated with its diverse sections on medicine and philosophy.

Moreover, when we consider the Cambridge Hebrew diagram in relation to the other panel illustrations in the manuscript,⁸⁷ there seems to be both a connection and a tension between them. The medical-illustration panels elucidate different practices related to bodily organs, and the addition of ventricles in the sensitive faculty in the Cambridge Hebrew diagram refers to the brain,

⁸⁴ For example: the sense of taste is in the tongue instead of in the palate (חוש הטעם בלשוו). The words "its faculties," which connect the center circle to the other three, have not been included. There are small changes in the four circles in the rational faculty, and the Guenzburg Hebrew diagram lacks the word "and" in the label of the practical component of the rational faculty.

^{85 &}quot;three faculties [...] which are the retentive, and the memory, and that which evokes the memory, according to the opinion of Averroes in the book *Sense and Sensibilia* [Epitome of Aristotle's *Parva Naturalia*] [...] the retentive, and the memory, he said that the retentive is the one that retains much with no doubt, and the memory is with doubt [...] and the faculty that evokes [memory] is called the evocative faculty, which is sent [?] to the memories [?] and seeks to remember [...] and from this faculty arise love, hate, bravery, fear and all [...]."

⁸⁶ There is also a medical sonnet discussing the colors of urine, written in Italian in Hebrew script. This particular sonnet has not been found elsewhere and is indicative of the scribe's originality and the manuscript's distinctiveness.

⁸⁷ See n. 21 above.

another bodily organ. However, the illustrations of the lessons, as well as the other faculties of the soul in the diagram, suggest that something more than physical is being depicted. The diagram as a whole represents a more meta-physical topic, which may also be the reason it was placed near the end of the manuscript, after the other panel illustrations.

In some cases, master craftsmen executed diagrams, and such specimens constitute works of art in their own right. However, more often they are unambitious pen-drawings inserted contextually or marginally by the scribe when the text was written or shortly thereafter.⁸⁸ It is reasonable to assume that in the case of the Cambridge Hebrew diagram it was the scribe who drew this diagram while inscribing the text. It is also possible that the scribe of this manuscript was the author of the diagram.

As the Cambridge Hebrew manuscript was probably intended for the scribe's use and kept in his library, we may speculate about the source of the diagram and the models that informed its production. Was either the Cambridge drawing or the Guenzburg drawing copied from the other? The existence of these two similar diagrams may suggest that there were more diagrams of this sort, and that this representation of the soul circulated broadly in Italy in the fifteenth century.

6 The Diagram: Unraveling Visual Connections with Other Sources

The visual organizational concept of placing the most important matter at the center of a ramified structure, which is characteristic of the Cambridge and Guenzburg Hebrew diagrams, can also be observed in several of the forty-two diagrams found in specific manuscripts of *De Missarum Mysteriis* ("On the Mysteries of the Mass") (Fig. 7). This treatise was written by Lothar of Segni in Rome shortly before his election as Pope Innocent III on January 8, 1198.⁸⁹ However, it is important to note that these diagrams are relatively small in size and enclosed within circles, and their thematic focus significantly differs from that of the two Hebrew diagrams. While it is unlikely that they directly served

⁸⁸ Evans, "Geometry of the Mind," 35; Murdoch, *Antiquity and the Middle Ages*, 113. In another Hebrew manuscript (Parma, Biblioteca Palatina, MS Parm. 2263, fol. 4r), a scribe identifies himself as the maker of a diagram: "I, Raphael the physician made this tree [...]."

⁸⁹ Jeffrey F. Hamburger, "Haec Figura Demonstrat: Diagrams in an Early-Thirteenth Century Parisian Copy of Lothar de Segni's De Missarum Mysteriis," Wiener Jahrbuch für Kunstgeschichte 58, no. 1 (2009): 9.

A FIGURA OF THE SOUL



FIGURE 7 Lothar de Segni, *De missarum mysteriis*. Gotha, Forschungsbibliothek, Memb. I 123, f. 1v

as a model for the Hebrew diagrams,⁹⁰ their existence highlights the central placement of important thematic material in diagrammatic representations during the Middle Ages.

The intriguing aspect of the Cambridge Hebrew diagram and the Guenzburg Hebrew diagram lies in their form, which distinguishes them from other diagrammatic representations of the topic in question. Diagrams of the faculties of the soul are well documented in Latin manuscripts. In her book *Lines of Thought: Branching Diagrams and the Medieval Mind*, Ayelet Even-Ezra studied horizontal forms of visualizing knowledge, which were typically used also for capturing the matters of the soul. She discusses five diagrams that deal with the faculties of the soul, each of which differs slightly from the others.⁹¹ One example, written in a late-fifteenth-century hand, appears at the end of a manuscript containing the works of Aristotle. This diagram describes the division of the soul into five faculties: vegetative, sensitive, appetitive, locomotive, and intellective.⁹² A diagram depicting the three faculties of the soul and the ventricles in horizontal form is found in a fourteenth-century manuscript (Fig. 8).⁹³

This horizontal diagram describes the relative location of the ventricles without giving a clear impression of their location within the human head. A more graphic type of diagram used an illustration of the head to indicate the position of the ventricles. Edwin Clarke and Kenneth Dewhurst note twenty-five such diagrams in printed books dating from the fifteenth and sixteenth centuries, along with twenty-two in manuscripts, but very few from before 1450.⁹⁴ Today these diagrams are known by the acronym SIFEM,

94 Clarke and Dewhurst, *Illustrated History of Brain Function*; Mary Carruthers, "Two Unusual Mind Diagrams in a Late Fifteenth-Century Manuscript (UPenn Schoenberg

⁹⁰ Note that the Hebrew diagrams in this article are not comparable to other diagrams that appear in Hebrew manuscripts, such as the Porphyrian tree or the kabbalistic sefirot, which are arranged along a vertical axis.

⁹¹ Ayelet Even-Ezra, *Lines of Thought: Branching Diagrams and the Medieval Mind* (Chicago: University of Chicago Press, 2021), 98. For more horizontal tree diagrams of the potencies of the soul, see the following manuscripts: Paris, Bibliothèque Nationale de France, Lat. 14717, fol. 2197; Paris, Bibliothèque Nationale de France, Lat. 6319, fol. 1r; Paris, Bibliothèque Nationale de France, Lat. 14719, fol. 1947; Paris, Bibliothèque Nationale de France, Lat. 15173, fol. 164r; Paris, Bibliothèque Nationale de France, Lat. 16149, f. 82r; Vatican, Biblioteca apostolica, Borgh. 296, fol. 328r; Vatican, Biblioteca apostolica, Borgh. 33, fol. 65v.

⁹² Paris, Bibliothèque nationale de France, MS lat. 14717, fol. 219r. For an English translation, see Even-Ezra, *Lines of Thought*, 98.

⁹³ In addition, there are other types of diagrams that mention the three different souls, but they do not provide any details regarding what each soul consists of. See, for example, Granum sinapis, Bern, UB, MS IX 24, fol. 40v.

Megur 7 4 9.59 2728 e mar areas syoreful my que procent will cont ente menning prestring pit dar i dug enter comple to : pushes nenny correl orn Thing something for. 1 The aring Themany Sto chemon A a munet andligence temos Pro Eugipity True P (Per Ecto ZE Admirato conres 2 Jubinto שבאחסדה השביונות 27 בידוסד. Sein nenpacu, איזיייש לא ביייין ל שמואינייים אי Ad an aptir Tom oru por settatoe it as celeptia pmi stationa formabilia If foras males fora de ano Domoblios et honora or no try find g- math eft ho norables get To ct- Pollary & logar er er matha & For ito iloso per opa pordine ha 107 えき liber upioz grir ono lib, ou poro ade fan (an de ma no el fun ctor & tri alte las no ff liber dielo er mudo gri gruor liber liber & and dair - tuber ou popro non 200 tempture of 1 tor alise like J gorname 2 wy proc 3 pir sy lib in pipro 4 are lib monetary gour gouor labry 159 145 3 por er ponfino hut marty pir suby par sup libry salas martinos fries We purelliveryo a comeo ut form pure Some Brought an comento Wharmens on comento. bb & jopno er mailes y deby mabrerti orth Taa his Stapport wite how any mes faas ht's planns ha ofif effecting bal matile 11 Streenword or temins fenal haneling 1. I dimorre et und explicit mota lie langt 2

FIGURE 8 Horizontal diagram depicting the three faculties of the soul and the ventricles. Paris, Bibliothèque Nationale de France, Lat. 6319, fol. 1r COURTESY OF BNF

which represents the five faculties of the brain: *sensus communis, imaginitiva, fantasia, estimativa,* and *memoria.*⁹⁵ An example of such a diagram can be found in the treatise *Margarita Philosophica,* compiled by Gregor Reisch in 1503 (Fig. 9).⁹⁶ The heading of the diagram reads *ANIMAE SENSITIVAE* (of the sensitive soul). Lines connect sense organs to the front of the brain, where the words *sensus communis* are written, followed by the words *imaginitiva* (below) and *fantasia* (above). The other ventricles are described according to a linear anatomic scheme: *estimativa* (below) and *cogitativa* (above) in the middle, and *memoria* at the back of the head.⁹⁷ This division evokes Avicenna's division of the internal senses, mentioned above. It is evident from the large number of SIFEM diagrams that they were used continuously from the Middle Ages until the early modern period. At first, the SIFEM diagrams accompanied texts dealing with the soul. At the end of the fifteenth century and at the beginning of the sixteenth century, it appears that these diagrams began to replace the geometric illustrations that were previously common in medical texts.⁹⁸

In both the Cambridge and Guenzburg Hebrew diagrams, the sensitive faculty appears in the upper part of the folio and is depicted in a similar manner to the SIFEM diagrams. The convergence of the five external senses in a single point is also evident, with lines connecting them to the various ventricles. It is not unlikely that the author of the Hebrew diagram was familiar with the visual tradition of the SIFEM diagrams. However, these illustrations are

Collection, LJS 429)," *Manuscript Studies: A Journal of the Schoenberg Institute for Manuscript Studies* 4, no. 2 (2019): 390.

⁹⁵ Verboon, "Brain Ventricle Diagrams," 219, 221.

⁹⁶ For additional examples, see O'Neill, "Diagrams of the Medieval Brain," 91–101; Whitaker, "Was Medieval Cell Doctrine More Modern than We Thought?," 46–47, 49–50; Clarke and Dewhurst, *Illustrated History of Brain Function*; Verboon, "Brain Ventricle Diagrams," 212–233.

⁹⁷ Between the first and second ventricle is written an additional word, *vermis*. The cells are connected by the *vermis* (worm), thought to be the passageway by which images moved through the system. Whitaker, "Was Medieval Cell Doctrine More Modern than We Thought?," 50.

⁹⁸ Verboon, "Brain Ventricle Diagrams," 219, 221. The influential medical encyclopedia *The Book on Medicine for Mansūr (al-Kitāb al-Mansūrī fī al-Tibb)* by al-Rāzī (c.864–925) includes geometrical forms to indicate the brain structure. See Clarke and Dewhurst, *Illustrated History of Brain Function*, 20. Hebrew manuscripts also contain these figures, and, as with Arabic manuscripts, they vary from manuscript to manuscript. In the context of the relationship between the parts of the soul and of the body (see n. 49 above), there are also schematic representations of the liver and heart. Murdoch, *Antiquity and the Middle Ages*, 234. Clay models representing the liver are also known from ancient Mesopotamia. A closer examination of the relationship between the diagram and those representations is necessary.



FIGURE 9 SIFEM diagram. Gregor Reisch, *Margarita Philosophica*, 1503 COURTESY: GETTY RESEARCH INSTITUTE, LOS ANGELES (86-B18873)

specific to the brain and its faculties, and the structure of the brain is only one aspect of the two Hebrew diagrams of the tripartite soul.

According to Even-Ezra,

The soul is unitary, but functions as a complex organizing principle of the entire body. While the external and internal senses were located in different areas of the head and were therefore available for illustrative anatomic presentation, the range of the soul's powers comprised also the vegetative and the intellective soul. The vegetative soul was considered holistically corporeal rather than associated with any specific organ, and therefore invisible. The intellective soul was invisible in its essence.⁹⁹

In Even-Ezra's view, horizontal tree diagrams are suitable for representing the three faculties of the soul, which are referred to as souls (vegetative, sensitive, and intellective). They do not bear any resemblance to the real, invisible soul but rather depict the way that one should think about its faculties; thus, they do, in fact, represent it visually.¹⁰⁰ I agree that one can also view the Cambridge and Guenzburg Hebrew diagrams in the same manner. The creator's selection of this structure for the depiction of the soul is crucial, with three different faculties on one folio, where each has a place on the folio and within the body.

In my view, both of the Hebrew diagrams demonstrate a combination of the horizontal tree diagram of the soul and the figurative diagram of the head. The author has reorganized the information from the horizontal tree, presenting it in a different format on the folio. Notably, the depiction of the sensitive faculty in the upper part of the folio resembles the portrayal of the ventricles within the head.

In one manuscript (Cambridge, Trinity College, MS O.7.16, fols. 46v–47r, Fig. 10), both forms of representation are depicted side by side. This thirteenthcentury French manuscript contains a copy of *De Spiritu et Anima*, a text that gained popularity partly due to its misattribution to St. Augustine. On the verso of one folio is a schematic diagram of the tripartite operation of the soul. Despite the fact that it begins with circles that resemble our diagrams, most of its textual content is arranged in the form of a horizontal tree. In this diagram, the sensitive faculty has two parts, namely *apprehensiva* and *motiva*, and the first operates through the exterior and interior senses.¹⁰¹ The internal senses are divided into three cells (*cellula*). On the opposite folio, a figurative diagram

⁹⁹ Even-Ezra, Lines of Thought, 99.

¹⁰⁰ Ibid.

¹⁰¹ There is another circle at the bottom of the folio representing the "will."

A FIGURA OF THE SOUL

Turinut fantalia Danut Binaput puia chima ajenio gua tua ra len tua alitat elus ra tenh MA alitatf.u Molins Alfartus nuelomunif andrenti Justin a fuller ash 19 44 Sultus mpant morus In fourniby uchan Suproz facel Applentura cu ou Taperte Aspectus. Inferior Frage aderaft

FIGURE 10 Horizontal diagram of the three faculties of the soul and figurative diagram of the head. Cambridge, Trinity College, MS O.7.16, fols. 46v–47r CREDIT: THE MASTER AND FELLOWS OF TRINITY COLLEGE, CAMBRIDGE

of the head uses information conveyed in the horizontal tree to depict the functions of the sensitive faculty through both external and internal senses. Rubrics indicate the bodily senses, while the head is divided into five chambers that are distributed through the three main regions of the brain.¹⁰²

In their depiction of the sensitive faculty, the Cambridge and Guenzburg Hebrew diagrams appear to mark an advance beyond the figurative diagram in Cambridge, Trinity College MS O.7.16. Unlike the Latin diagram, where the outer and inner senses are clearly separated and there is no transmission between the ventricles, the Hebrew diagrams illustrate their connection. The horizontal pathway depicted in the Hebrew diagrams provides a more compelling explanation of the relationship between the various components of cognitive processes and the flow of information within the brain.¹⁰³ In this way, and in line with other images of the brain, the Hebrew diagrams showcase

¹⁰² Bagnoli, *Feast for the Senses*, 137.

¹⁰³ Ibid., 22.

a scientific approach and a genuine interest in comprehending the actual mechanisms of brain function as understood in this period. 104

7 Conclusion

During the Middle Ages, visual components and diagrams were significant elements in the process of creating, studying, transmitting, and memorizing knowledge.¹⁰⁵ Moreover, how we perceive a written text differs from how we perceive a diagram, table, or synopsis.¹⁰⁶ The understanding of the diagram not as an illustration but as a tool for thinking was to assume great importance in the Middle Ages.¹⁰⁷ Jeffrey Hamburger writes, "Diagrams deal with process, both in the world and, no less importantly, in the mind: they plot rational-ity and map out cognitive as well as mechanical practices and procedures."¹⁰⁸ In other words, diagrams convey more than information; they reveal the intentions and passions of their creators.¹⁰⁹ The diagram at the heart of this article illustrates the work of the author, his process of thinking, and his cultural context, while at the same time it also addresses cognition.

Diagrams can be also likened to maps, serving as visual guides.¹¹⁰ In both the Cambridge and the Guenzburg Hebrew diagrams, the arrangement of circles, plain and ornamented, serves as a pathway leading the reader from the center to different units spread across the folio. This layout enables a clear and effortless understanding of the elements comprising the faculties of the soul. Moreover, within the sensitive faculty, the reader is able to discern the intricate process of thought unfolding within the brain. These diagrams thus serve as a

¹⁰⁴ Ibid., 137-138.

¹⁰⁵ Yuval Harari, "Functional Paratexts and the Transmission of Knowledge in Medieval and Early Modern Jewish Manuscripts of Magic," in *The Visualization of Knowledge in Medieval and Early Modern Europe*, ed. Marcia Kupfer, Adam S. Cohen, and Jeffrey H. Chajes (Turnhout: Brepols, 2020), 183.

¹⁰⁶ Murdoch, Antiquity and the Middle Ages, 113; Andrea Worm, "Ista est Jerusalem'. Intertextuality and Visual Exegesis in Peter of Poitiers' Compendium Historiae in Genealogia Christi and Werner Rolevinck's Fasciculus Temporum," Proceedings of the British Academy 175 (2012): 128.

¹⁰⁷ Hamburger, "Mindmapping," 65; Jeffrey F. Hamburger, Diagramming Devotion: Berthold of Nuremberg's Transformation of Hrabanus Maurus' Poems in Praise of the Cross (Chicago: University of Chicago Press, 2020), 24.

¹⁰⁸ Hamburger, "Mindmapping," 64.

¹⁰⁹ Hamburger, *Diagramming Devotion*, 16.

¹¹⁰ For a diagram that is not a "silent" map, see Chajes, "Kabbalistic Diagram as Epistemic Image."

vital tool enabling physicians to advance the discourse on the body-soul paradigm and attain a more scientific understanding of the human body.

The subject of the soul and the brain was well known and much discussed in Hebrew philosophic and scientific sources, as can be seen from the various treatises mentioned in this article. The diverse sources, including both original Jewish treatises and translated works of non-Jewish origin, were distributed among different Hebrew manuscripts produced in Italy in the fourteenth and fifteenth centuries.¹¹¹ As mentioned, the diagram in the Cambridge Hebrew manuscript does not originate from a single specific treatise.¹¹² Instead, it appears to be a unique synthesis of various sources on the soul, created by an innovative author.

However, one can identify the intellectual trend and medical approach the author followed, which aligns with Galenic medicine and the Aristotelian-Averroean philosophy of the soul. The threefold division of the soul into faculties connects the philosophy of the soul, medicine, and the different physical processes endemic to human development. He also chose to attribute sensation to the brain, and by doing so endorsed a particular view in a longstanding discussion in the medical-philosophical tradition concerning the soul, its division into faculties, and their location in the body. The vegetative faculty also belongs among the physiological functions. After enumerating the seven functions of the nutritive faculty, Maimonides in his *Eight Chapters* states that the discussion about how they perform their functions belongs to physiology, and therefore the treatment appropriate to them belongs to the science of medicine.¹¹³ However, according to him, a human being is a single unit that requires harmonious interactions among all the parts of the soul.¹¹⁴

The diagram serves as a clear demonstration of the author's originality in "translating" his chosen concept into a visual representation. The author has created a new source that stands independently, effectively producing a

¹¹¹ According to the Ktiv database (https://www.nli.org.il/en/discover/manuscripts/hebrew -manuscripts).

¹¹² There are several other treatises on the soul that I did not consult, such as Zerahiah Hen's translation of the Pseudo-Farabi *Treatise on the Quiddity of the Soul* (Italy, 1248); Judah Romano's translation from Latin of Pseudo-Thomas Aquinas and Pseudo-Giles of Rome (between 1320 and 1330); and the translation, by Samuel ben Judas of Marseilles, of Alexander of Aphrodisias's book from Arabic to Hebrew (Spain, 1323 and 1340). Zonta, "Medieval Hebrew Translations," 38, 54, 55, 56, 58. One can find more treatises in the Ktiv database, such as Gersonides's commentary on Averroes's Aristotle treatise.

[&]quot;113 "The detailed discussion of these seven faculties [...] belongs to the science of medicine." Maimonides, *Eight Chapters*, 40.

¹¹⁴ Aviad, Guide to the Perplexities of the Soul, 51, vii.

"visual" treatise. The diagram compellingly demonstrates the efficacy of visual representation in simplifying intricate concepts. By opting for this visual structure, the author showcases his ability to add value and interpretation.¹¹⁵

Visual representations of the soul were not commonplace in Hebrew manuscripts. Thus, the Hebrew text, combined with its distinctive diagrammatic representation, provides insights into the author's cultural orientation and his engagement with other diagrammatic structures of the time, including diagrams of the human head. It becomes evident that the author was familiar with the medieval cell doctrine and utilized it to affirm his claim that the brain is the center of the senses. Following this tradition, he situates the sensitive faculty in the upper part of the folio.

Additionally, late medieval Christian iconography features diagrams that depict the soul in relation to Christian religious tenets and the concept of the Great Chain of Being.¹¹⁶ For example, a manuscript of northern Italian origin compiled in the late twelfth or early thirteenth century features a hierarchical schema extending from the earth to a depiction of Christ seated in majesty at the top. This schema incorporates parts of the world soul – vegetable, animal, and rational, as well as a celestial soul. It is a hierarchical representation that originates from the coarser, more material dimensions of existence and moves progressively to the finer, more ethereal and immaterial parts of the world (Fig. 11). This diagram accompanies a short text on the destiny of the soul based on the symbolism of the numbers three and ten.¹¹⁷ However, it is more difficult to determine the conceptual connection between these kind of diagrams and the Cambridge Hebrew diagram. It is worth considering that the author of the Hebrew diagram chose to present three faculties of the soul rather than five, as in the Aristotelian scheme; perhaps the author was influenced by the religious significance and meaning of the number three in Christianity. He may have sought to promote the visual representation of the three faculties of the soul within a Hebrew context.

Following in the steps of one innovative author who invented the novel schema, another scribe copied it. Thus, we have two similar diagrams in two different manuscripts. The relationship between the two diagrams could indicate a connection between these two manuscripts, one of which we do not have information about. The existence of two similar diagrams raises the

¹¹⁵ Norbye, "Arbor Genealogiae," 90.

¹¹⁶ A representation of the hierarchical structure of life from inanimate things to God.

¹¹⁷ Jeffrey F. Hamburger, "The Triple Essence of the Visual Process', or Thinking with Diagrams in the Middle Ages and Modernity," *Codex Aquilarensis* 37 (2021): 53–54; Murdoch, *Antiquity and the Middle Ages*, 333–334.



FIGURE 11 The Great Chain of Being rising from the earth to the figure of Christ seated in majesty. Paris, Bibliothèque Nationale de France, Lat. 3236A, fol. 90r COURTESY OF BNF

possibility that we will find more exemplars in the future, but they may also be the only surviving expressions of this unique schema. Either way, these diagrams represent a uniquely Jewish visual paradigm unveiling multiple layers of knowledge, interpretation, and assimilation between medieval cultures.

Appendix: Texts of the Cambridge and Guenzburg Hebrew Diagrams

The following table presents the Hebrew texts of the Cambridge Hebrew diagram and the Guenzburg Hebrew diagram along with an English translation of the text of the Cambridge diagram. Differences between the Cambridge and Guenzburg texts are indicated in red.

	Translation of Cambridge Hebrew diagram	Cambridge Hebrew diagram	Guenzburg Hebrew diagram
Title	this figure is drawn in order to show all the faculties of the soul	הצורה הזו נרשמת כדי להראות בה כל כוחות הנפש	-
	the substance of the soul	עצם הנפש	עצם הנפש
	Aristotle defined the soul thus: the soul is a first existence and entelechy of a natural organic body having life potentially. [Cambridge Ms only:] Plato defines it in another way: the soul is a self-moving incorpo- real substance	אריסטוטלו גודר הנפש כן הנפש הוא קיום ראשון ומשלים גוף טבעי כליי חי בכח אפלטון יגדרנה בדרך אחר אמר הנפש הוא עצם בלתי גשמי מתנוענע בעצמו	גדר הנפש לארסטו הנפש הוא קיום ראשון ומשלים גוף טבעי כליי חי בכוח
The vegetative faculty	the nutritive faculty and also called the vegetative faculty	הכח הזן ונק׳ גם כן כח הצומח	כח הזן נקרא גם כן כח הצומח
	the attractive faculty	כח <mark>ה</mark> מושך	כח מושך
	the retentive faculty the digestive faculty	כח <mark>ה</mark> מחזיק כח <mark>ה</mark> מעכל	כח מחזיק מעכל

	Translation of Cambridge Hebrew diagram	Cambridge Hebrew diagram	Guenzburg Hebrew diagram
	the repulsive faculty	כת <mark>ה</mark> דותה	כת דוחה
	the faculty that excretes the humors / the excretory faculty	כח <mark>ה</mark> מבדיל הליחות	כח מבדיל הליחות
	the procreative faculty	כת <mark>ה</mark> מוליד	כח מוליד
	the preparatory faculty	כת <mark>ה</mark> מכין	כח מכין
	the formative faculty	כח <mark>ה</mark> מצייר	כח מצייר
	the faculty of growth	כח <mark>ה</mark> מגדל	כח מגדל
The sensitive	the common sense and	החוש המשותף <mark>ונק׳</mark>	חוש משותף נקרא גם
faculty	also called the internal emotion / passion	גם הרגש פנימי	הרגש פנימי
	sense of sight in the eye	חוש הראות בעין	חוש הראות בעין
	sense of hearing in the ear	חוש השמע באוזן	חוש השמע באזן
	sense of smell in the nose	חוש הריח באף	חוש הריח באף
	sense of taste in the pal- ate [Guenzburg MS: in the tongue]	חוש הטעם <mark>בחיך</mark>	חוש הטעם ב <mark>לשון</mark>
	sense of touch in the whole body	חוש המשוש בכל הגוף	חוש המשוש בכל הגוף
	the first ventricle	<mark>ה</mark> חדר <mark>ה</mark> ראשון	חדר ראשון
	this ventricle is in the	<mark>ה</mark> חדר <mark>ה</mark> זה הוא	חדר זה הוא במוקדם
	front of the brain and	במוקדם המוח <mark>ויש</mark>	המוח ובו שני כחות
	has two faculties: the	בו שני כחות <mark>ה</mark> חוש	חוש משותף וכח
	common sense and	המשותף ו <mark>ה</mark> כח	מדמה כפי דעת אבן
	the imaginative faculty	<mark>ה</mark> מדמה כפי דעת אבן	רשד בספר החוש
	according to the opinion	ר <mark>ו</mark> שד בספר החוש	והמוחש
	of Averroes in the book Sense and Sensibilia	והמוחש	

(cont.)

Parva Naturalia]

	Translation of Cambridge Hebrew diagram	Cambridge Hebrew diagram	Guenzburg Hebrew diagram
	the middle ventricle	החדר <mark>ה</mark> אמצעי	חדר אמצעי
	arbitrative faculty and also called judicial faculty	<mark>ה</mark> כוח <mark>הבורר ונק׳</mark> גם כן שופט	כח בורר נקרא גם כן שופט
	the third ventricle	החדר <mark>ה</mark> שלישי	חדר שלישי
	here are three faculties: the retentive, and the memory, and that which evokes memory	יש כאן ג׳ כחות השומר והזוכר והמעורר לזכור	פה שלושה כחות שומר זוכר מעורר לזכור
The rational faculty	the intellectual faculty and also called the rational faculty	הכח השכלי ונק׳ גם כן כח דברי	בח שכלי נקרא גם כן כח דברי
	and of it – the practical	וממנו מעשי ו	ממנו מעשי
	the faculty to conceive something before doing it	כח <mark>ה</mark> משתכל בדבר טרם עשייתו	כח משתכל בדבר טרם עשית[ו]
	the faculty to distinguish between good and evil	כח <mark>ה</mark> מבחין בין טוב לרע	בח מבחין בין טוב לרע
	of it – the speculative/ theoretical	ממנו עיוני	ממנו עיוני
	the faculty by which one apprehends the primary intelligibles, as it is known without proof that the whole is greater than the sum of its parts	הכח אשר בו ישיג המושכלות הראשונות כמו שידוע בלא ראייה כי הכל יותר גדול מן החלק	בח משיג המושכלות ראשונות כמו הכל גדול מהחלק כי זה ידוע בלא ספק ראיה

(cont.)

78

Translation of Cambridge Hebrew diagram	Cambridge Hebrew diagram	Guenzburg Hebrew diagram
the faculty to appre- hend the secondary intelligibles, like things which require proof or demonstration to verify them and understand them, which are not known at the beginning of one's thought, like the primary intelligible, and are therefore called secondary intelligibles	כח המשיג המושכלות שניות כגון העיניינים שצריכים ראייה או מופת לאמת אותם ולהשכילם שאינם נודעים בתחילת עייונם במושכל ראשון על כן נקראים מושכלות שניות	כח משיג המשכלות שניות כמו העיני־ נים הצריכים ראיה או מופת לאמתם ולהשכילם שאינם נודעים בתחילת העיון במושכל הראשון ע״כ נקראים מושכלות שניות
the faculty which abstracts the forms from their matters, like the human form which is the intellect/ reason, and through this faculty the human being understands the intellect abstracted from its matter	כח המפשיט הצורות מחומריהם כגון צורת האדם שהיא השכל ובזה הכוח יבין האדם השכל המופשט מחומרו	כח מפשיט הצורות מחמריהן כמו צורת האדם שהיא השכל ובזה הכוח יבין האדם השכל מופשט מחמרו והבן
the faculty of appre- hending the separate forms, like the separate intellects, which are themselves separate and there is no necessity to	כח המשיג הצורות הנפרדות מעצמם כמו השכלים הנפרדים שהם מעצמם נפרדים ואין צורך להפשיטם	כח משיג הצורות הנפרדות כמו השכלים הנפרדים כי הם מעצמם נפרדים אין צורך להפשיט אותם

abstract them

Translation of Cambridge Hebrew diagram	Cambridge Hebrew diagram	Guenzburg Hebrew diagram
[Guenzburg мs]: three		שלושה כוחות []
faculties that are		שהם שומר זוכר
the retentive, and the		מעורר לזכור כפי
memory, and that which		דעת אבן רשד בספר
evokes the memory,		החוש והמוחש
according to the opinion		[] השומר והזוכר
of Averroes in the book		ואומר כי השומר הוא
Sense and Sensibilia		שישמור הרבה בלא
[Epitome of Aristotle's		ספק והזוכר מהספק
Parva Naturalia]		והמעורר הנקרא כח
the retentive, and the		המתעורר ונשלח [?]
memory; he said that the		לזכרונות[?] לבקש
retentive is the one that		לזכור ומזה הכח יבאו
retains much with no		האהבה והשנאה
doubt, and the memory		הגבורה והפחד וכל
is with doubt and		[]
the faculty that evokes		
[memory] is called		
the evocative faculty,		
which is sent [?] to the		
memories [?] and seeks		
to remember, and from		
this faculty arise love,		
hate, bravery, fear, and		
all []		

Acknowledgments

I would like to express my sincere gratitude to those who have contributed to the development and completion of this article. First, I am deeply indebted to Prof. Sarit Shalev-Eyni, my esteemed PhD dissertation supervisor, whose guidance and insights have been invaluable throughout the entire process.

(cont.)

I extend my heartfelt appreciation to Prof. Zeev Harvey, under whose mentorship in the course "A Spirit of Grace (Ruah hen)" at the Hebrew University, I encountered Jewish philosophy and presented an initial paper on the subject. His thoughtful reading and constructive comments have significantly enriched the content. I also want to express my gratitude to him for his assistance and suggestions regarding the English translations of the diagram's terms. Special thanks are due to Dr. Orly Lewis for her insightful feedback on an early draft, contributing to the refinement of the ideas presented in this work. I am grateful to the participants in the spring 2023 semester of the Harry Starr Seminar in Judaica at Harvard University, under the guidance of Prof. David Stern. Their thoughtful engagement with the early draft played a crucial role in shaping the direction of this paper. Jeffrey F. Hamburger's excellent course at Harvard, "Diagram as Paradigm," was highly beneficial for this article in various ways. My sincere thanks go also to Dr. Andrea Gondos, Dr. Magdalena Jánošíková, and the anonymous readers for their valuable comments and suggestions that ultimately contributed to the finalization of this article. Lastly, I would like to acknowledge the support received from the Halpern Center for the Study of Jewish Self-Perception at Bar Ilan University and a Harry Starr Fellowship in Judaica at Harvard University's Center for Jewish Studies. The research was co-funded by the European Union. The views and opinions expressed are those of the author and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.