Successful transmission of philosophical and scientific lore from one cultural environment into another is a multi-stage process, which involves not only those who disseminate the knowledge in its new climate, but also the knowledge’s target audience. This claim is especially relevant when discussing the process of transmission and inculcation\integration of Greco-Arabic knowledge in\into the medieval Jewish communities of Provence. The process’ first stage was indeed the emergence of philosophical and scientific Hebrew works (both translations and original treatises) written by Arabophone Jewish scholars – agents of knowledge – such as Abraham Bar Hiyya, Abraham Ibn Ezra, Judah ibn Tibbon and Joseph Kimhi. This initial and crucial stage, which emerged in the twelfth-century and continued throughout the Middle-Ages, has justifiably received a great amount of attention in the scholarly literature and discourse. PESHAT’s last conference, for example, was titled “Translating Ibn Rushd into Hebrew”, and the one before that was entitled “Themes, Terminology, and Translation procedure in 12th-century Jewish Philosophy”. \Nevertheless\Despite the crucial role of this stage\, one must take into consideration that translating a philosophical or a scientific treatise from one language into another does not guarantee that the knowledge contained in the translated work will indeed be integrated into its new cultural environment. Historians, philosophers and sociologists of science and knowledge point at diverse factors that affect the manners by which notions, beliefs and theories are accepted or rejected in different social climates. Be these factors as they may, integration of knowledge into a new cultural environment does not happen overnight. Knowledge assimilates in new environments after it has been studied, examined, discussed and interpreted (and in some famous cases, after it has been criticized or even ignored for a limited period of time). These actions should be considered as the second stage of the process of transmission (second, which does not necessarily replace the continuity of the first; or in our case of study, does not bring the activity of the Hebrew translation movement to its end). This stage is responsible for strengthening and stabilizing the shoulders of the giants, on which others will later stand. Fortunately, the stage of acclimation and integration usually leaves clear historical footprints. One significant footprint is the emergence of different literary genres which seek to assist its readers internalizing the new scientific knowledge – such as commentaries, books of instruction, summaries of works that are already available, and textbooks designated\designed for those who seek to acquire specific knowledge. This is the exact role that one should attribute to the astronomical section of Gershom ben Solomon’s *Sha‘ar ha-Shamayim*: mediating and providing convenient access to astronomical knowledge that was already available to the Hebrew reader who resided in Gershom’s geographical and cultural environment.

Gershom ben Solomon’s *Sha‘ar ha-Shamayim* is a compendium of scientific knowledge, probably written in the last quarter of the thirteenth-century. Unfortunately, we know little about the author. We are not familiar with any other treatise he has composed. In the introduction to *Sha‘ar ha-Shamayim*, Gershom states that in compiling his work he drew not only on Hebrew literary sources, but also on knowledge that he gained through conversations with Jewish and non-Jewish scholars. Gershom’s reliance on knowledge [he] obtained through oral communication is well evident from his extensive usage of non-Hebrew terms, *le*ʿ*azim*, many of which are in Provençal dialect. This fact, alongside some other evidence, indicates that Gershom ben Solomon was active, or at least educated, in Provence.

According to the same introduction, *Sha‘ar ha-Shamayim* was intended to be divided into three sections. The first is devoted to Physics (Hokhmat ha-Teva), the second to astronomy (Hokhmat ha-Tkhuna), and the last to metaphysics (Hukhmat ha-Elout; although the part on metaphysics is missing, and perhaps was never written). All in all, the work touches upon distinct scientific disciplines, including meteorology, mineralogy, botany, zoology, anatomy, sleep and dreams, cosmology, Ptolemaic astronomy, and psychology.

Gershom’s *Sha‘ar ha-Shamayim* gained much popularity in the Middle Ages and early modern period: the work is extant in no less than forty-five manuscripts and six printed editions, the first of which was published in 1547 Venice. According to the\a book-list prepared in 1595 at the request of Bishop Francesco Gonzaga, the Jews of Mantua possessed no less than 16 copies of the printed edition of the work. It was also used as [a]source material for a number of 14th and 15th century works, among them Meir Aldabi’s *Shvilei Emunah* and Joseph Israel ben Abraham’s *Sefer Toldot ha-Adam*.

The astronomical section of *Sha‘ar ha-Shamayim* is a collection of cosmological and astronomical texts. It mostly consists of verbatim copy of passages in different lengths borrowed from ten already available Hebrew sources. Gershom has made a clever selection of the texts he quoted, re-organizing them, and creating a smooth linkage between discussions by means of short original comments and remarks. The astronomical section received a thorough examination in my Ph.D. dissertation, entitled “Astronomy and Astrology in the Hebrew Encyclopedias of the Thirteenth Century”, which was written under the supervision of Shlomo Sela at Bar-Ilan University; and examined the astrological and astrological sections of six encyclopedic works composed during the thirteenth century. My examination revealed, *inter alia*, that the astronomical section of *Sha‘ar ha-Shamayim* includes neither seven chapters – like one would find in the printed editions – nor sixteen chapters – as modern research has noted. Instead, I discovered the existence of twenty chapters, and I point to evidence that the astronomical section probably included more chapters that are now-lost. The dissertation provides an in-depth analysis of all twenty available chapters, a glossary of technical terms, and a study of Gershom’s *modus operandi*.

Now, another important conclusion was that the astronomical section of *Sha‘ar ha-Shamayim* does not contain any innovative astronomical knowledge\notions, its contents are elementary, and it lacks [of] basic astronomical information found in other non-technical textbooks on astronomy from the [same] period. It does not discuss\describe, for instance, the models that explain the motions of the planets, nor [it] explains basic phenomena, such as lunar and solar eclipses. The reader will find neither geometrical explanations nor descriptions of mathematical algorithms underpinning astronomical tables. Nevertheless, one should not underestimate the importance of the work. The astronomical section of *Sha‘ar ha-Shamayim* very much succeeds in providing a lucid presentation of the essence of medieval cosmology. Without knowing if the book was actually used for pedagogical purposes, we can at least state that the astronomical section could be used as a good textbook for students with no prior background. In this manner, it is possible that the elementary level of the astronomical section reflects a deliberate\intentional attempt to popularize scientific knowledge. However, since the astronomical section might have consisted of additional chapters which are now-lost, we should be careful in drawing these kinds of conclusions.

Let us now turn to *Sha‘ar ha-Shamayim*’s astronomical vocabulary, or, being more precisely, astronomical vocabularies. Contrary to other sections of the work, the astronomical section lacks of *le*ʿ*azim* (with only one exception), and it is entirely based on literary sources~~, all of which were written in Hebrew~~. The astronomical section is an eclectic one, consists\ting[?] of direct quotations [taken\borrowed] from distinct Hebrew sources that do not always use the same technical vocabulary. How did Gershom approach the various Hebrew terminologies found in his sources? Did he seek to create terminological standardization in his work, namely, to consistently attribute one semantic signifier to each signified and vice versa? Well, we find that in most cases Gershom adopted the vocabulary that he encountered in his sources, thereby engendering a terminological inconsistency. However, in some specific instances, Gershom did replace the terms found in his sources with alternative ones. What motivated Gershom to change terms in certain passages but not in others, and what did he try to achieve through these selective changes in vocabulary? I will now attempt to address this question.

Chapter 11 of the astronomical section of *Sha‘ar ha-Shamayim* intends to clarify that the planets and stars move by means of the motion of their orbs. The first two-thirds of this chapter are based on chapter 15 of Solomon ben Moses Melguiri’s Hebrew translation of Pseudo-Avicenna’s *On the Heavens and the World*. Now, when Melguiri translated this text from Latin into Hebrew, he was well aware \that a\of\ similar discussion is found in the Talmud (פסחים). Interestingly, Melguiri has decided to borrow the Talmudic terms, integrating them into his discussion. After translating a few passages from Pseudo-Avicenna’s work into Hebrew, Melguiri adds the following remark:

אמר המעתיק. הבאתי במאמר הזה מזלות במקום ככבים למען דעת בעלי המשנה הלשון הלקוח מדברי רז"ל. וגם כן תכנתי לשונם במלת חוזר וחוזרין במקום סובב וסובבים מפני שהם אמרו כן.

Solomon ben Moses Melguiri then explicitly states that he uses, in this specific context, the term ‘Mazalat’ to denote Stars or Planets, and חוזר to \denote\instead-of\ revolve\סובב\; all in order to follow the language of Ḥazal.

Let us now turn back to chapter 11 of Gershom’s *Sha‘ar ha-Shamayim*. Most of this chapter is a verbatim copy of chapter 15 of Melguiri’s translation of Pseudo-Avicenna’s *On the Heavens*. However, we find that Gershom avoids using the Talmudic terms borrowed by Melguiri. Gershom replaces the term מזלות found in Melguiri’s translation with כוכבים, and uses מתנועעים instead of חוזרין. In addition, Gershom replaces the Talmudic term קבוע with נח עומד, or תקוע.

Let’s take a look at the opening of chapter 15 of Melguiri’s Hebrew translation [of Pseudo-Avicenna’s *On the Heavens and the World*] and compare it with the opening of chapter 11 of the astronomical section of *Sha‘ar ha-Shamayim*:

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| --- | --- | --- |
| English Translation | *Sha‘ar ha-Shamayim*, chapter 11 (MS Vatican 388, 148r): | Melguiri’s translation of Pseudo-Avicenna’s *On the Heavens*, chapter 15 (MS. Paris 1050, 70v): |
| That the heavens move\in[a-state-of] motion\, and not the stars, is proved as follows. If we say that the stars move\, their motion must be in one of [these] three ways: either they [the stars] will move together with the orb at the same rate; or the orb is still and the stars move\; or the orb moves\ and the stars are still. | ושהשמים מתנועעי' ולא הכוכבי' יתבאר כן. אם נאמר שהכוכבי' מתנועעי' לא ימלט מהיות תנועתם באחת משלש דרכי': אם שיהיו מתנועעי' יחדיו הגלגל תנועה שוה לשניהם; או **שהגלגל נח עומד והכוכבי' מתנועעים**; או **שהגלגל מתנועע והכוכבי' תקועי'**. | והשמים מתנועעים לא הככבים יתבאר כן. ואם נאמר שהכוכבים מתנועעים אינם נמלטים מהיות תנועתם באחת משלש דרכים: או שהם יתנועעו יחדיו עם הגלגל תנועה שוה לשניהם; או **שהגלגל קבוע ומזלו' חוזרים**; או **שהגלגל חוזר ומזלות קבועים**. |

Following Melguiri’s translation, Gershom refutes the first two options and states that the third one, namely that “the orb revolves and the stars are still”, is correct. Melguiri inconstantly uses the above-mentioned Talmudic terms throughout chapter 15 of his translation, while Gershom constantly avoids\avoiding the usage of these terms.

Why Gershom, who usually quotes his sources verbatim, has decided to avoid Melguiri’s Talmudic terms? Does Melguiri’s remark regarding his terminological usage motivate Gershom to replace these terms with alternative ones? Is it possible that Gershom intentionally avoided these terms since he was aware of the difficulties which may arise from creating an eclectic treatise in an era that scientific Hebrew terminology is not yet fixed? This last question must be answered in the negative. We have several\not a few\ examples in which Gershom uses two distinct terms to denote one semantic signified; and, though more rarely, he also uses a term in two different meanings. While Gershom by no means sought to create terminological standardization in his work, it seems as he intentionally avoided using terms that he had thought might confuse his readers, and tried to find a term that is more accurate than the one he had found in his source. That is why, in my estimation, he replaced Melguiri’s מזלות, חוזרים and קבוע with כוכבים, מתנועעים, and נח עומד, respectively. Indeed, in most of his terminological adjustments – which are not many – Gershom replaces a less common or an obscure term with a more common one. For instance, in quoting Abraham Bar Ḥiyya’s *Ṣurat ha-*ʾ*areṣ* the author avoids using the expressions ‘גדיש הצל’ (pile of shadow) and ‘גדיש’, and he simply replaces them with ‘צל’. Once, Gershom even replaces the term ‘חצוב’ (“derived”) with ‘נפרש’ (Bar Ḥiyya uses both). One should note that in \using\Gershom’s usage of\ this specific source, he\Gershom\ takes more freedom than he does in source materials written or translated by the Tibbon\Tibbonide family. From time to time, Gershom sees fit to edit Bar Ḥiyya’s text or add his own original remarks, all in order to clarify Bar Ḥiyya’s arguments\intentions\notions\ideas.

Gershom also replaces a term found in Solomon ibn Ayyub’s translation of Averroes’ Middle Commentary on Aristotle’s *On the Heavens* with an alternative one. In the discussion of absolute and relative heaviness and lightness (all in order to show that the orbs are neither light nor heavy), Ibn Ayyub adopts the terms ‘~~מוחלט’ and~~ ‘מצורף’ or\and ‘מצטרף’ to denote ~~‘absolute’ and~~ ‘relative’\relativeness\ ~~respectively~~ (כבד מצורף וקל מצורף; in contrast to כבד מוחלט וקל מוחלט). Gershom, on the other hand, replaces the term ‘מצורף’ with ‘כערך’. Now, both terms were popular in the period, but they do not denote [precisely] the exact same thing. The term ‘מצטרף’ stands, *inter alia*, for the Aristotelian category ‘relative’ (which is a ‘thing toward something else’). It was used in this context in Judah ibn Tibbon’s translations of אמונות ודעות and חובות הלבבות, as well as by Moses ibn Tibbon, Qalonymos ben Qalonymos, and Shem Tov Falaquera. The term ‘ערך’, on the other hand, was used to denotes ratio or relation, and it has been used by famous Jewish scholars such as Abraham Bar Ḥiyya, Abraham Ibn Ezra, Maimonides, Shmuel ibn Tibbon, as well as by later Hebrew translators. Note that Judah and Moses ibn Tibbon have used both terms in their work.

To conclude, Gershom ben Solomon did not seek to create [a]terminological standardization in the astronomical section of his work. Essentially, he embeds a verbatim copy of passages from his different Hebrew [literary] sources, thereby, adopting the distinct vocabularies of his sources. However, as we saw\noted, in some instances Gershom did avoid using terms found in his sources [and he has used\borrowed alternative terms]. In my estimation, these adjustments occurred in order to avoid obscure, not-enough-known, or inaccurate terms and create a smoother reading of his work. In fact, we have more (and I believe stronger) indications\evidence that Gershom puts real effort into creating as lucid text as possible. For example, in many instances his presentation of a scientific theory\and-or-notion\idea\ is followed by different evidence supporting the \theory\ he gathered from \different\his distinct\various\ sources; but he does not bring all evidence found in his source materials. Gershom had selected the evidence he saw fit, mostly those that stay untechnical; and it seems as he looked, intentionally or unintentionally, for the equal balance between presenting as many arguments\evidence that support the claims\theory under discussion; and keeping his work as lucid, fluent, and untechnical as possible. This is one of the characteristics that, I believe, very much contributed to the popularity of *Sha‘ar ha-Shamayim*.

The work held by the medieval translators was indeed a necessary condition for the successful process by which Greco-Arabic knowledge was transmitted and integrated into the medieval Jewish communities of Latin Europe. However, it was not a sufficient condition. Successful transmission of knowledge is always a process in which both sides – the transmitters, or agents of knowledge, and the\its receivers – \should be\are\ involved. The appearance\emergence of textbooks that seek to provide a lucid presentation of knowledge that was already available to Hebrew readers is a clear indication that knowledge was indeed starting\ed\began\ to be integrated into society; or, if I may borrow Thomas Kuhn’s terminology\term\expression, become a part of normal-science. These works, then, provide us with a golden opportunity to see not only how the early readers of the Hebrew translations received, interpreted, used, and disseminated the philosophical and scientific knowledge contained in the translations; but also to learn about the dynamics of knowledge transfer.