A Geographical List in Hebrew Previously Ascribed to Abraham Bar Ḥiyya[1]

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Abstract: A geographical list in Hebrew was published in 1851 as an appendix to a treatise on the calendar by Abraham Bar Ḥiyya (d. ca. 1136). It is argued here that this list has nothing to with Bar Ḥiyya; rather, it was copied from the Tables of Barcelona (second half of the fourteenth century), and derives in part from the geographical list in the zij of Ibn al-Kammād (early twelfth century).

Keywords: Coordinates of cities, Tables of Barcelona, Ibn al-Kammād, Meridian of Water, Soria (Castile)

Abraham Bar Ḥiyya of Barcelona (d. *ca*. 1136) compiled the first set of astronomical tables in Hebrew, and it was largely based on the zij of al-Battānī (d. 929). Although, in many zijes, including that of al-Battānī, there is a list of cities with their geographical coordinates,[2] no such list is found in the published version of Bar Ḥiyya's set of tables.[3] However, in Filipowski's edition of Abraham

1. I am grateful to Ofer Elior who sent me electronic copies of pages in several Hebrew manuscripts, to José Chabás for his comments on a draft of this paper, to Ilana Wartenberg for comments on Bar Ḥiyya's treatise on the calendar, and to two anonymous referees for information about geographical lists ascribed to Abraham Ibn Ezra and Abraham Bar Ḥiyya. Julio Samsó kindly provided me with information on Arabic dialects in Andalusia.

2. Nallino 1899–1907, 2:33–54.

3. Millás 1959. For Bar Ḥiyya's tables Millás consulted 4 manuscripts: see p. 110. See also n. 14, below.

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Bar Ḥiyya's treatise on the calendar, *Sefer ha-'ibbur*, published in 1851, there is a list of cities with their coordinates appended to the text.[4] Indeed, it has been accepted that the list published by Filipowski was compiled by Abraham Bar Ḥiyya.[5] Nevertheless, on the basis of the evidence presented here, we conclude that, despite Filipowski, the list of cities with their coordinates that he published has nothing to do with Bar Ḥiyya.[6] This geographical list is of particular interest because it is based on the "meridian of water" which was approximately 17;30° to the west of the standard meridian based on the Fortunate Islands (= the Canary Islands). Thus, the longitude of Toledo is given here as 28;15°, rather than 11° which is its longitude from the standard meridian.[7] In 1994 Comes called attention to the importance of the meridian of water in geographical lists, and included Bar Ḥiyya among those who used it.[8]

On the title page of his edition, Filipowski indicated that he depended on a manuscript in Oxford and an unspecified manuscript in Paris. I have checked the one manuscript of *Sefer ha-'ibbur* in Oxford (Bodleian Library, MS Opp. 183 = Neubauer No. 2016), the three manuscripts in Paris (Bibliothèque nationale de France, MSS Heb. 805, 1047, and 1061, as well as copies in Munich, Bayerische Staatsbibliothek, MS Heb. 36, and Vatican, Biblioteca Apostolica, MS Heb. 386. The Oxford copy, dated 7 Nisan 5236 A.M. (= 1 April 1476), is the only one to which a geographical list is appended. The singular occurrence of this table in manuscripts of Bar Ḥiyya's treatise is the first indication that Filipowski may have incorrectly assigned this list to Bar Ḥiyya.

4. Filipowski 1851, p. 120.

5. As far as I can determine, Millás (1949, p. 249) was the only scholar to cast doubt on Bar Ḥiyya's authorship of this list.

6. Shlomo Sela kindly informed me about a list of cities with their coordinates (in degrees only), compiled in the twelfth century by Abraham Ibn Ezra and preserved in the third version of his treatise on the astrolabe, *Keli ha-neḥošet*: see, e.g., Paris, Bibliothèque nationale de France, MS Heb. 1031, 154a, and MS Heb. 1054, 9b. Ibn Ezra's list differs from the list published by Filipowski. Cf. Sela 2003, p. 30.

7. For other geographical lists in Hebrew, see Goldstein 2018; Goldstein and Chabás 2017, pp. 366–368; Goldstein 2001, p. 263; and Cohn 1918, pp. 31–33. The relative paucity of geographical lists in Hebrew stands in contrast to the vast number of such lists in Arabic: see Kennedy and Kennedy 1987.

8. Comes 1994, p. 47. Comes cited Laguarda (1988, pp. 45–47, 66) who, in turn, depended on Filipowski's edition of 1851.

Filipowski's list agrees with that on f. 42a of the Oxford manuscript: the cities are listed in the same order, and their coordinates are the same, but for a few mistakes in the transcription. However, Filipowski added an entry for Soria (Castile), with coordinates, in a row above the entry for Santarin: Filipowski's source is probably the geographical list in Abraham Zacut's *Almanach Perpetuum*,[9] for Soria does not appear in the geographical list in the Oxford manuscript, although it is mentioned in the heading of a calendrical table on f. 43a, "Table for finding the *molad* (conjunction) according to the mean motion for Soria".[10]

The key finding is that the geographical list in the Oxford manuscript is identical, but for a few variants, with the corresponding list in Hebrew manuscripts of the Tables of Barcelona (The Tables of King Peter IV of Aragon: second half of the fourteenth century): Vatican, Bibilioteca Apostolica, MS Heb. 356, 44b, and MS Heb. 379, 174b; and Parma, Biblioteca Palatina, MS 2915 (= de Rossi 165), 9b. The list in the Oxford manuscript and in the Hebrew copies of the Tables of Barcelona is headed "Table for the longitudes of cities [counted] from the beginning of the inhabited world (*ha-yiššub*) [in the West][11] and their latitudes from the equator": see Appendix. The Oxford list has 22 entries (or 23, if Perpignan is included),[12] beginning with Santarin (= Santarem, Portugal) and ending with Mecca; the list in Vatican, MS 379, has 22 entries, beginning with Santarin and ending with Mecca. The list in Vatican, MS 356, has 23 entries, beginning with Santarin and ending with Burgos after the entry for Mecca. The 22 cities in common in these two Vatican manuscripts are in the same order and have the same coordinates (with minor variants) as the 22 cities

9. See Zacut 1496, 168v, where the coordinates of Soria are 28;13° (long.); 41;38° (lat.), exactly as in Filipowski 1851, p. 120. For the same data in the Hebrew version of Zacut's *Almanach Perpetuum*, see Cohn 1918, p. 33.

10. This table is transcribed in Filipowski 1851, p. 119. Based on the occurrence of Soria in the heading for this table, Filipowski (p. vii) assumed that Soria was Bar Ḥiyya's place of birth or his place of residence. It seems, however, that this table has nothing to do with Bar Ḥiyya, and that it is one of several tables appended to Bar Ḥiyya's text in the Oxford manuscript.

11. Omitted in the Oxford manuscript.

12. Filiowski's list has a single entry for Monpesler [= Montpellier] and Perpignan, whereas in the Oxford manuscript the entry is for Montpellier, with Perpignan added in small letters below it in the same cell enclosed by the grid lines. In the other copies of this list in Hebrew (Vat. 356, Vat. 379, and Parma 2915) Montpellier is included but Perpignan is not, and this is also the case for the version in Catalan.

in the Oxford manuscript. The entries at the beginning of the list in the Parma manuscript are illegible due to water damage; the last entry is Tarascon (in Provence) which comes after Mecca, where Tarascon is written in a different hand. In Millás's edition of the Tables of Barcelona, the geographical list of 29 cities with their coordinates is based on the Catalan version, of which 18 entries agree with those in the Latin version of Ibn al-Kammād's *al-Zīj al-muqtabis*: see Madrid, Biblioteca Nacional de España, MS 10023, 54v.[13] All 22 entries in the Hebrew list also appear in the Catalan version of the Tables of Barcelona, with minor variants.

It has recently come to my attention that in one copy of Bar Ḥiyya's set of astronomical tables, there is a list of 26 cities with their coordinates: Chicago, Newberry College, MS Heb. 2, 4a.[14] It is not clear if this list goes back to Bar Ḥiyya but, in any event, it is different from the list in the Oxford manuscript. The first entry in this list is for Paris with coordinates 20;0° (long.), 48° (lat.), and the second entry is for Marseille (מרשלייה)[15] with coordinares 28° (long.), 44° (lat.). Neither of these two cities is listed in the Oxford manuscript. Toledo's coordinates in the Chicago manuscript are 28;30° (long.) and 39;54° (lat.), whereas in the Oxford manuscript they are 28;15° and 39;52°, respectively. It is surely noteworthy that Barcelona, where Bar Ḥiyya was active, is not included in the list in the Chicago manuscript: this omission casts doubt on his authorship of that list.

It seems then that the copyist of the Oxford manuscript, probably in Soria or Perpignan, appended the geographical list in the Tables of Barcelona to Abraham Bar Ḥiyya's treatise on the calendar, and this list was not compiled by Bar Ḥiyya.

13. Millás 1962, p. 138, and Chabás 1996, p. 515; see also Chabás and Goldstein 1994, pp. 35–36.

14. This manuscript was not consulted by Millás: see n. 3, above. This list is also different from Ibn Ezra's list: see n. 6, above.

15. For the Hebrew name of Marseille, see Gross 1897, p. 366.

Appendix:

Table of the Longitudes of Cities [Counted] from the Beginning of the Inhabited World [in the West] and their Latitudes from the Equator: Oxford, Bodleian Library, MS Opp. 183, 42a

Names of the Cities	Climate	Longitude	Latitude
Santarin [= Santarem]	5	23;40°	40;15°
Nubia[a]	4	24;10	35;15
Fas [= Fez]	4	25; 0	33; 0
Sebta [= Ceuta]	4	25;40	35;20
Sevilla	5	25;40	37;15
Malaqa [= Malaga]	5	26;22[b]	37; 0
Córdoba	5	27; 0	38;30
Granada	5	27;30	37;30
Almería	5	28; 0	36;30
Toledo	5	28;15[c]	39;52
Murcia	5	29;30	37;30
Valencia	4	30;20	36;25
Mallorca	4	37; 0	39; 0
Barcelona	5	33; 0	41;10
Sicily	4	65;20	37;30
Alexandria	4	63; 0	31; 0
Egypt	3	64;50	29;55
Gerona	4	30; 0	41;30
Monpesler [= Montpellier]	4	32;10	43; 0
Perpignan[d]	4	32;30	–
Toulouse	5	50; 0	42;45
Jerusalem	4	69;30	32; 0
Mecca	2	79; 0	21;40

a. With Vat. MS 379, read: Ṭanya [= Ar. Ṭanja; Eng. Tangier].[16] Vat. MS 356: Nunya. In the edition of the Tables of Barcelona (Millás 1962, p. 138), and in Ibn al-

16. Although it is unusual, there are other examples of the shift from /j/ to /y/ in Andalusian Arabic: see Corriente 1977, p. 52. See also Goldstein 1967, p. 280 (P 12b:6, 8, etc.), where Ibn Ezra

Kammād's zij (Madrid, MS 10023, 54v), the corresponding entry with the same coordinates is for Tangier.

b. Vat. MS 379: 26;22; Vat. MS 356: 26;0.

c. Vat. MS 379: 28;15; Vat. MS 356: 28;31.

d. Perpignan occurs in the Oxford MS, but not in Vat. MS 356, Vat. MS 379, or Parma MS 2915.

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transliterated Arabic *jaib* (sine) into Hebrew as *yaiba* (יבא); and Chabás and Goldstein 2003, p. 24 (ch. 4:11), where the Arabic month *Rajab* is transliterated into medieval Castilian as *raiab*.

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