

Le Louvre des Antiquaires
2 Place du Palais-Royal
75001 Paris (France)
tel. +33 (0)1 42 60 15 58 • fax. +33 (0)1 40 15 00 25
info@lesenluminures.com

2970 North Lake Shore Drive
Chicago, IL 60657 (USA)
tel. +773 929 5986
fax. +773 528 3976
chicago@lesenluminures.com

[Miscellany on Astronomy], including ABRAHAM BAR HIYYA, *Tsurat ha-Arets*; IMMANUEL BEN JACOB BONFILS, *Shesh Kenafayim* [Six Wings]; ABU AL-QASIM AHMAD IBN AL-SAFFAR, [Manual on the Astrolabe]; GEORGE PEURBACH, *Iyyun ha-Kokhavim ha-Meshartim* [*Novae theoricæ planetarum*]; Abraham ibn Ezra, *Keli ha-Nehoshet* [*The Brass Instrument*].

In Hebrew, illustrated manuscript on paper
Austria (?), Gratz?, c. 1575

200 ff., on paper, with watermarks (on paper, no perfect match but watermarks very close to (1) Briquet, "Aigle a deux tetes" [f. 45 and 48], no. 285: Gratz, 1594-1598, Millstatt (Carinthie), 1597-1600, Vieme, 1599; but also no. 282: Gratz, 1580 [Austria], var. identique: Osnabruck, 1588; (2) Briquet, another variant of "Aigle a deux tetes" [f. 189], close to no. 291: Gratz, 1598, var. simil. Kempten, 1607-1627; (3) Another watermark, apparently not in Briquet [f. 84 and 87], apparently complete although some leaves have been torn and restored, with some loss of text (collation impracticable due to rebinding), old foliation in ink in Hebrew letters, written in several different hands in brown ink in various Ashkenazi semi-cursive scripts, on up to 24 long lines, some rubrics in red, illustrated with 25 full-page illustrations and 52 pages of tables (tables in red and brown ink, e.g. ff. 107-130v), with numerous small diagrams in text. Bound in modern brown half morocco over cloth (corners restored, not affecting text, the 12 leaves of the second text torn vertically through text and expertly restored without obscuration of text, leaf 75 defective, 2 leaves of tables from fifth treatise inlaid). Dimensions 202 x 148 mm.

Astronomical Miscellany with a large number of illustrations, tables and diagrams and 8 texts, including treatises on the astrolabe, which are largely unpublished and unedited. Among the most significant is George Peurbach's revised, unpublished version of Ptolemaic astronomy in a Hebrew translation. The interesting, comprehensive collection of both older and newer Hebrew scientific texts is important in particular because it serves to illustrate the continued interest of Jews in the science of astronomy even after the pinnacle of Jewish involvement during the medieval period.

PROVENANCE

1. Although there are no marks of original ownership the paper suggests production in Austria after mid-century (see watermarks above). The name Yitshaq Cohen appears on the opening flyleaf, where there are various notes in a very late hand. Perhaps he was an owner, though not the original one.

2. Samuel David Luzzatto (1800-1865), Italy, Trieste and Padua. Luzzatto was an Italian philologist, poet, and biblical exegete, who authored a large number of important writings both in Hebrew and in Italian and who also left a voluminous correspondence.
3. Solomon Hayyim Halberstam (1832-1900), his MS 134, as per the owner's stamps found on ff. 1, 199v, confirmed by notes found on the last leaf of codex with shelfmark 134. Polish scholar and bibliophile, Solomon Halberstam was a wealthy and avid collector and scholar of Hebrew manuscripts, including codices from Luzzatto's estate and Zunz's private library.
4. Sir Moses Montefiore (1784-1885), his MS 423, as per the shelfmark label pasted on lefthand corner of upper pastedown, and gilt on spine "Montefiore MS. 423." Most famous English Jew of his time, Montefiore became a legend in his lifetime, fighting worldwide for the lives and rights of Jews. He founded after the death of his wife Judith Lady Montefiore a college in Ramsgate, which with the appointment of Haham Moses Gaster in 1887, acquired many manuscripts including the Halberstam Collection.

London, Jews' College, on deposit since 1899, as part of the Montefiore Endowment.

New York, Sotheby's, *Important Hebrew Manuscripts from the Montefiore Endowment*, 27-28 October 2004, lot 308, for \$25,200.

TEXT

The 8 texts are as follows:

I.

ff. 1- 66v, Abraham Bar Hiyya. *Tsurat ha-Arets* [Form of the Earth and Figure of the Celestial Spheres]. 1st 9 leaves missing according to Hebrew foliation; begins in the middle of the sixth chapter of the first part, whose topic is geography. Numerous and extensive explanatory notes, some inserted parenthetically within the margins of the text, others in the margins. Most of the notes are in the same hand as the text, indicating that the glosses were transmitted along with the text; this is not at all unusual. It does however indicate the intense interest in the subject matter of Bar Hiyya's book. F. 66 is a blank.

Composed in the twelfth century, *Tsurat ha-Arets* is one of the earliest scientific texts written in Hebrew, and almost certainly the first exposition of the Ptolemaic system in Hebrew. In line with the rich tradition of Arabic "*hay'a*" texts, Bar Hiyya describes the form or configuration of both the earth and the heavens. Thus *Tsurat ha-Arets* is both a work on geography and astronomy, and it long remained the chief source of geographic knowledge among Jews.

This section of the manuscript includes on ff. 64v-65r schematic diagrams for the theories of the sun (f. 64v) and moon (f. 65r), throughout the course of one revolution (beginning at the solar apogee). Explanatory remarks in the margins: for the sun, indicating in particular at which points of the circuit the correction of center is positive or negative, and for the moon, illustrating the set of orbs employed in its more complex model.

II.

ff. 67r-78v, Judah ha-Nasi, Abridgement of Bar Hiyya's *Tsurat ha-Arets*.

This is a little known text by a little known figure. The text was composed no later than the fifteenth century and is as yet unpublished and unstudied. It begins, "In the opinion of all the scholars and investigators in the science of astronomy, the heaven is made as a sort of sphere, round on all sides, and the eighth heaven encompasses all of the heavens below it, which rotate from east to west once each day, with an equal rate. . . ." The terminology differs somewhat from the usual locutions; for example, *qetsev* (translated "rate" in the citation just given) is not found elsewhere. The author is especially interested in lunar theory, much less so in the other planets or in geography; the reason seems to be the special interest of Jews in lunar theory for understanding the basis of the calendar.

Two other copies of this text are known to exist. It has not been edited or studied in detail anywhere.

III-V.

ff. 79-100; ff. 100v-101v; ff. 102-130v, Immanuel ben Jacob Bonfils, *Shesh Kenafayim* [Six Wings], along with two anonymous commentaries;

The six "wings" are, in fact, six tables used to compute eclipses of the sun and the moon. However, since a solar eclipse occurs only at conjunction with the moon; and luni-solar conjunctions (with various refinements, mainly concerning mean and true conjunctions) mark the beginning of the months in the Jewish calendar, Bonfils's tables were useful for those with a deep interest in the Jewish calendar. Moreover, since the computation of Easter in Christian calendars still depends upon the nineteen-year cycle used in the Jewish calendar, there was reason for Christian readers to take notice of the tract, not just those astronomers interested in computing eclipses. Indeed, Bonfils's little book reached a tremendous readership in the original Hebrew as well as translations into Greek, Latin, and Slavic. There exist quite a few commentaries—further testimony to its wide impact. The first commentary begins on f. 79, the second on f. 100v; *Six Wings* commences on f. 107a, ending on f. 128v.

This copy has been prepared by a careful student of astronomy. Throughout the tables (which begin f. 107), there are notes at the bottom or to the side reporting on errors which the copyist found in "an old book" (the book from which he copied out our manuscript), and declaring that he has recomputed the numerical entries. On ff. 129-130, there appear several more tables, along with accompanying explanatory remarks, also by Immanuel Bonfils. On f. 129: a table correlating the sun's position in the twelve zodiacal signs with the dates in the twelve months of the civil calendar; on f. 129v, solar altitude "in Tarascon or Avignon"; on 130r-v, short retabulations of solar data in the form required for astrology.

There is no preliminary census of the many commentaries to the Six Wings, nor an edition.

VI.

ff. 131-144v, Abū al-Qāsim Ahmad ibn al-Saffār, [Manual for the astrolabe], translated from the Arabic by Jacob ben Makhir;

Jacob ben Makhir was scion of the famous Ibn Tibbon family of translators, and author of a number of astronomical works of his own. Ibn al-Saffār (d. 1035) studied in Cordova, later moving to Denia. His tract was one of the most popular astronomical manuals of the medieval period; it was translated into several languages, and remained in use for some four hundred years. The Hebrew version was very popular. For the commentary, see Steinschneider, 1893, pp. 580-84.

About thirty manuscripts of this work are extant; but they have not been systematically studied. .

VII.

ff. 145-193v, George Peurbach. *Iyyun ha-Kokhavim ha-Meshartim* [*Novae theoricæ planetarum*];

ff. 170-193v contain illustrations accompanying the treatise, finely drawn and copied (ultimately) from a Latin printing. The treatise by Peurbach (died 1461) presents a revised version of Ptolemaic astronomy; the revisions are due both to painstaking observations carried out by Peurbach and others of the "Vienna school," as well as to a close study of the literature available at the time (including Ptolemy's *Almagest* in the original Greek; Peurbach began a new translation of this basic text into Latin shortly before his death). The popularity of Peurbach's *Theoricæ* is well attested to by its printed editions, which number well over fifty. The various editions were edited by notable scholars such as Erasmus Reinhold and Regiomontanus.

The *Theoricæ* was translated several times into Hebrew; our manuscript has the translation of Efraim Mizrahi. Two leading rabbis of the sixteenth century, Moses Isserles and Moses Almosnino, wrote commentaries to Peurbach's book. Some of the materials on ff. 185-193v are Hebrew versions of tables and notes from Erasmus Reinhold's work on Peurbach (*Theoricæ novæ planetarum Georgii Pubacchii Germani*), first published in 1542 (second edition, 1551), which helps establish a terminus post quem for the work. Figures similar to those on ff. 179v-183v are to be found in a manuscript in the Bodleian Library (MS Seld Sup. A 104). The Hebrew text is not published.

VIII.

ff. 196-200v, Abraham ibn Ezra. *Keli ha-Nehosbet* [The Brass Instrument].

Approximately the first half of this treatise on the astrolabe is preserved here, and a few words at the very beginning are also missing. The text contained in this manuscript is from the third, expanded version (see Sela, *Abraham Ibn Ezra*, p. 339), which differs considerably from the only edited version, published by H. Edelman, Koenigsberg, 1845.

This miscellany includes an interesting collection of Hebrew scientific texts, important in particular because they serve to illustrate the continued interest of Jews in the science of astronomy even after the pinnacle of Jewish involvement during the medieval period. The codex presents an elegant and comprehensive collection of texts, such as those that would have been studied by Jews as we enter the early modern era. Included is a combination of older texts that enjoyed a very long shelf

life, seeing as their contents remained relevant, but also newer writings. Examples of the later specimens are the epitome of Bar Hiyya, which answers to the more inward-looking Jewish thought of the period, and of course, Peurbach's important text. In addition, the significant marginalia testify to the active interest of Jewish readers, who checked other versions and jotted various critical and explanatory remarks in the margins.

LITERATURE

Aiton, E. J. "Peurbach's *Theoricae novae planetarum*: A translation with commentary," *Osiris*, 2nd series, 3 (1987), pp. 5-44.

Edelman, H. *Kli Neboshet li-Rabbi Abraham ben Ezra*. Koenigsberg, 1845.

Green, Daniel W.E. "Peurbach [Peuerbach, Purbach], Georg von," in Thomas Hockey (ed.), *The Biographical Encyclopedia of Astronomers*, vol. 2, New York, Springer, pp. 897-898.

Hirschfeld, H. *Descriptive Catalogue of the Hebrew Manuscripts of the Montefiore Library*, London, MacMillan, 1904 (reprint from *JQR*, 1902 and 1903), no. 419; see the separate catalogue of the Halberstam collection of 412 manuscripts published as *Qebillath Shelomoh*, Vienna, 1890.

Langermann, Y. Tzvi. "Iberia" in *idem*, *The Jews and the Sciences in the Middle Ages*

Langermann, Y. Tzvi, "Peurbach in the Hebrew Tradition," *Journal for the History of Astronomy* 29 (1998), pp. 137-150 (also available online).

Levy, B. Barry. *Planets Potions and Parchments: Scientifica Hebraica from the Dead Sea Scrolls to the Eighteenth Century*, (exhibition catalogue for the Jewish Public Library), Montreal, McGill-Queen's University Press, 1990, p. 31.

Levy, Tony. "Abraham ibn Ezra et les mathématiques; remarques bibliographiques et historiques," in *Abraham Ibn Ezra--savant universel, Conférences données au colloque de l'Institutum Iudaicum. Namur, 25 novembre 1999*, ed. P. J. Tomson, Brussels, 2000, pp. 60-75.

Rius, Mònica. "Ibn al-Saffār," in Thomas Hockey (ed.), *The Biographical Encyclopedia of Astronomers*, vol. 1, New York, Springer, pp. 566-567.

Sela, Shlomo. *Abraham Ibn Ezra and the Rise of Medieval Hebrew Science*, Leiden, Brill, 2003.

Sela, Shlomo and Gad Freudenthal. "Abraham Ibn Ezra's Scholarly Writings: A Chronological Listing," *Aleph* 6 (2006), pp. 13-55.

Solon, Peter. "The Six Wings of Immanuel Bonfils and Michael Chrysokokkes," *Centaurus* 15 (1970), pp. 1-20.

Steinschneider, M. *Die hebräischen übersetzungen des Mittelalters*, Berlin, 1893, pp. 580-84.

Taube, Moshe. "Transmission of Scientific Texts in 15th-Century Eastern Knaan," *Aleph* 10.2 (2010), pp. 315-353.

Sela, Shlomo. *Abraham Ibn Ezra and the Rise of Medieval Hebrew Science*, Leiden, Brill, 2003.

ONLINE RESOURCES

Langermann, Y. Tzvi, "Peurbach in the Hebrew Tradition," *Journal for the History of Astronomy* 29 (1998), pp. 137-150.

<http://articles.adsabs.harvard.edu//full/1998JHA....29..137L/0000137.000.html>

Site in Hebrew by Dr Ido Yavetz—highly recommended:

<http://gadid.blogspot.com/2010/04/wandering-starts-and-eternal-spheres.html>

TM 434

ONLINE RESOURCES

Thurston, Herbert. "Missal," in *The Catholic Encyclopedia*, vol. 10, New York, Robert Appleton Company, 1911

<http://www.newadvent.org/cathen/10354c.htm>

Introduction to liturgical manuscripts:

"Celebrating the Liturgy's Books":

<http://www.columbia.edu/itc/music/manuscripts>

British Library on the Mass:

<http://www.bl.uk/catalogues/illuminatedmanuscripts/TourLitMass.asp>

TM 472