

Alchemy and Armaments: On an aljamiado Fragment in a Houghton MS

Eleazar Gutwirth*

Tel-Aviv University

ORCID ID: <https://orcid.org/0000-0002-1149-9455>

MS Typ. 479 Houghton Library, Harvard University is a compendium of miscellaneous works in Italian. The subject of the following lines is not this Italian compendium but rather some folios at the end of the codex. They are not in Italian. Although sometimes described as being in Hebrew we can say for certain that the text in these pages is not in Hebrew. It is in Hebrew characters, and may be described as Judeo-Catalan *aljámia*. The identification of the content reveals that it is concerned with and uses the language of alchemy. It has multiple references to armaments. The article attempts to reconstruct a historical context for Jewish interest in alchemy and armaments in late medieval Spain.

KEYWORDS: Jews in Medieval Spain; Jews and Alchemy; Jews and Armaments; Aljamiado texts.

ALQUIMIA Y ARMAMENTO: SOBRE UN FRAGMENTO ALJAMIADO EN UN MANUSCRITO DE LA HOUGHTON LIBRARY.— El MS Typ. 479 Houghton Library, Harvard University es un compendio de obras miscelaneas en italiano. El tema del artículo no consiste en este compendio. Se centra en algunos folios al final del código. Aunque se ha descrito como texto hebreo es seguro que no se trata de palabras hebreas. Se trata de caracteres hebreos y se puede describir como aljamía judeo-catalana. La identificación del contenido revela que el MS trata de alquimia y utiliza su lenguaje. Contiene múltiples referencias a armas. El artículo trata de reconstruir un contexto histórico para el interés judío en alquimia y armas en la España bajo-medieval.

PALABRAS CLAVE: Judíos en la España bajo-medieval; judíos y alquimia; judíos y armas; textos aljamiados.

* gutwirth@tauex.tau.ac.il

1. THE MS

MS Typ. 479, Houghton Library, Harvard University is not a Hebrew book. It contains Aesop's fables and other works in Italian.¹ It is an illuminated, colorful MS which has been exhibited to the public. The subject of the following lines is not this Italian compendium but rather some pages at the end of the codex: 110v-112r.² They are not in Italian. Although described as being "in Hebrew" we can say for certain that the text in these pages is not in Hebrew. It is in Hebrew characters, which is quite a different thing. Nor is it helpful to label it Ladino.³ It is in *aljamá*.⁴ The pages are placed at the end. This might lead to thinking

¹ See the list in the Catalogue. The text and minimal description may be accessed in the MS website <<http://iiif.lib.harvard.edu/manifests/drs:7872697>>: "Uno libro il quale chompuose Senacha [Seneca] per detto di molti saui filosofi sopra le quatro virtu chardinali (ff. 1r-6v) 2. Il libro disopo [Aesop] (7r-61r) 3. Il libro degli ammestramenti i quali ci dice Chato (Dionysius Cato, Disticha de moribus ad filium; 61v-70r) 4. La chartula che mando Santo bernardo a Rinaldo dove amestra che dispregiamo il mondo per atquistare la grolia (sic) di [Dio] (70v-78r) 5. La pistola la quale santo Bernardo mando a uno chavaliero dove nammaestra di chonservare glonori e beni temporali con piacere e grazia dell'altissimo Idio (78r-80v) 6. Il libro che fecie Il sauiio Albertano [Albertano of Brescia], Nel quale namaestra sopra il parlare (81r-88v) 7. Legend of St. Eustachius, beginning "N el tempo che Troiano [Trajan, sic] Imperadore di Roma istaua in Roma e adoraau Glidoli ..." (89r-97v)." The description reads: "notes in Hebrew (110v-112r)." See Seymour MONTEFIORE and Robert ROSSO DE RICCI, with the assistance of W. J. WILSON, *Census of Medieval and Renaissance manuscripts in the United States and Canada* (New York, 1935-1940. 3 vols.); Christopher Urdahl FAYE, William Henry BOND and Seymour RICCI, *Supplement to the Census of Medieval and Renaissance Manuscripts in the United States and Canada* (New York, 1962) p. 280. See also Matteo LUTI, "Un testimone poco noto del volgarizzamento di Albertano da Brescia secondo Andrea da Grosseto (Bibliothèque de Genève, Comites Latentes 112)," *Medioevi: Rivista di Letterature e Culture Medievali* 3 (2017) pp. 35-94, note 31.

² After a page in Latin characters (fol. 112v) and an empty folio (113), fol. 114r contains a further shorter *aljamiado* text.

³ Haïm Vidal SEPHIHA, *Le ladino (judéo-espagnol calque). Structure et évolution d'une langue liturgique* (Paris: Vidas Largas, 1979. 2 vols).

⁴ On *aljamia*, see Michelle M. HAMILTON, *Beyond Faith: Belief, Morality and Memory in a Fifteenth-Century Judeo-Iberian Manuscript* (Leiden-Boston: Brill, 2014), especially the Introduction, and Raquel SUÁREZ GARCÍA and Ignacio CEBALLOS VIRO, (eds.), *Aljamias. In memoriam Álvaro Galmés de Fuentes y Iacob M. Hassán* (Gijón: Trea, 2012).

about the date of the MS. In a MS which is usually dated to the 1380s, this raises the question whether the last pages are chronologically linked to the scribal efforts on the MS or to the work of the early binders. Similarly in need of explanation is the presence of the Jewish cultural artifact in a thoroughly Christian MS of the late fourteenth century.

Recent work on the history of the book in late medieval Hispano-Jewish communities has underlined the multifaceted significance of the binders, of Jews in the binding craft and of their judeo-converso followers. We have various documents and other types of evidence as to the Jews in this field. There are documents about late medieval Jewish binders, there are requests by ecclesiastics for Jewish binding work; and there is also a growing corpus of evidence based on finds of Hebrew characters at various points of late medieval hispanic MSS in Latin characters (in Catalano-Aragonese areas to be sure, but also in Castile as in the *Biblia de Arragel*) which lead to the conclusion of Jewish involvement in paper and binding and its cultural significance, affecting, as it does, our perspectives on the relations between Jewish and Christian books.⁵ The last pages of the Houghton MS need to be seen in this light.

2. ALCHEMY

The text presents itself as a series of paragraphs with an epigraph or subtitle. One of the repeated elements of the rubrics is “*de luna*.” This brings us to the question of alchemy and the Jews. In broader terms and on another plane, the much debated question of whether there was a medieval Jewish interest in alchemy needs some awareness of the Genizah evidence. The plethora of medieval Hebrew character MS fragments on alchemical themes at the Genizah of the Ben Ezra Synagogue in Cairo and their location is now known for the CUL’s T-S collection and other collections may have more.⁶ The subject of Jews and alchemy

⁵ Eleazar GUTWIRTH, “Le toldot ha-sefer we-ha-qri’ah” [“History of the book and history of reading”], in *Asufa le-Yosef*, eds. Moshe IDEL, Yosef KAPLAN, Yaron BEN NAEH and Jeremy COHEN (Jerusalem: Shazar, 2014) pp. 263-284.

⁶ Gabriele FERRARIO, “The Jews and Alchemy: Notes for a Problematic Approach,” in *Chymia: Science and Nature in Medieval and Early Modern Europe*, eds. Miguel LÓPEZ

had been treated by Moritz Steinschneider,⁷ Gerhard Scholem⁸ and a number of others who, unlike us, did not see the place and date, the Iberian peninsula or the late middle ages as the meaningful parameters. Indeed, in the case of a Hebrew character text in a late medieval Sephardi hand such as this, reconstructing the Iberian-Jewish historical background is a priority. We are now fortunate to have access to a number of contributions by R. Patai such as his edition and study of the MS at the Bibliothèque Nationale de France (Fonds Hebr. 1207, fols. 155 verso-158 verso). The author of that Hebrew text on alchemy was a Jewish physician who lived in Spain in the fourteenth or fifteenth century, and knew Hebrew and Spanish.⁹

PÉREZ; Didier KAHN and Mar REY BUENO (Newcastle upon Tyne: Cambridge Scholars Publishing, 2010) pp. 19-29, and the bibliography in the notes. For the location of alchemical MS fragments in the CUL T-S collection, see note 3 of Paul B. FENTON, "Rabbi Makhlof Emsellem (1837-1928), Alchemist and kabbalist from Morocco," *Peamim* 55 (1993) pp. 13-92 [in Hebrew].

⁷ Moritz STEINSCHNEIDER, *Die hebraeischen Uebersetzungen des Mittelalters und die Juden als Dolmetscher* (Berlin, 1893) pp. 824-825.

⁸ See, for example, Gershom SCHOLEM, "Alchemie und Kabbalah," *MGWJ* 69 (1925) pp. 13-30 and 95-110. Relevant Hispano-Jewish texts include the *Zohar* and works by Falaqera, Qalonymos ben Qalonymos.

⁹ Raphael PATAI, "An unknown Hebrew medical alchemist: a medieval treatise on the quinta essentia," *Med Hist.* 28:3 (1984) pp. 308-323. Another MS, which seems to have been unknown to Patai, would seem to be relevant here, because it combines Hebrew character and Latin character alchemical texts and also as an added piece of evidence to show that alchemy was more widespread in Hispano-Jewish culture than thought in recent years. The MS had belonged to the collection of Heinrich Kellner; Freiherr von Holzhausen, i.e. the Frankfurt jurist who lived in 1536-1589. He acquired it in Louvain, in 1558. It is now part of the medieval Latin group of MSS at the University Library of Frankfurt under the call mark Lat. Oct. 231. It could be described as a small "library" or collectanea of alchemical texts. The texts are in Spanish, Latin, French and Judeo-Spanish aljamia and the MS is believed to be from ca. 1480. After the end of the aljamiado section there is a curious interlinear transcription into Latin characters of Hebrew angelic "names" [fol. 141v] and a *Zahlenquadrat*, or "magic square" on fol. 140v. The aljamiado text contains rubrics such as fol. 188v "... la obra del simiento de la luna" or fol. 189v "para sacar la quintaesencia de oro" or "este es el mercurio rubificado para la obra susodicha" or "este es el oro blanco susodicho." It begins at fol. 194 and finishes at fol. 142 (evidently, the Hebrew text was paginated according to the Latin direction). It begins with the conventional abbreviation of b[arukh] h[ashem] reconfirming that the scribe was a Jew (from Spain, probably Castile). It mentions more than once an Alonso de Almazan as an authority on alchemy. On fol. 137v

A fuller historical context is still a desideratum. In the case of documented Jewish alchemists, none is better known than Menahem, active in the 1340s and alchemist at the court of Pedro IV of Aragon. According to Patai

The name of Magister Menahem appears the first time in a document dated June 1345, which tells about a lawsuit brought by a certain Jose Maria Quadrado in Palma de Mallorca, accusing Jacobus Rubeus and “Magister Menaym [Menahem] Judeus” of defrauding people with counterfeit silver and gold. Points III through VII of the indictment read (in Dr. Joseph Salemi’s translation)...¹⁰

José María Quadrado Nieto was born in Ciutadella on 14/6/1819 and died in Palma de Mallorca, on 6/7/1896. He was a journalist, writer and historian. The main point to remember is that in 1843 he became the archivist of the Archivo Histórico de Mallorca, thus achieving close proximity to the primary evidence on the late medieval period including documents on Menahem. But obviously he could not litigate with that alchemist.

In any case, as Quadrado and Romano¹¹ realized, Menahem was of interest as a concrete, documented case of late medieval Hispano-Jewish alchemists. Menahem achieved fame (he is mentioned by later chroniclers) and closeness to the monarch, Pere IV, King of Aragon (*ca.* 1336-

we find, mostly in Latin characters: “Quando ombre echare mano al espada diga nonbre מַצְמֶטֶת [matsmetset].” The (vocalized) Hebrew “name” is in a different, less elegant or regular, hand than the aljamiado part. This text might be relevant from the perspective of alchemy and armaments. On Kellner, see Ulrich TRUMPOLD, *Heinrich Kellner 1536-1589. Studien zu Recht, Verwaltung und Politik in Frankfurt am Main im 16. Jahrhundert* (= *Studien zur Frankfurter Geschichte* 11 [Frankfurt am Main: Kramer, 1975]). For the Latin character texts, see the description in *Die mittelalterlichen Handschriften der Gruppe Manuscripta Latina beschrieben*, eds. Karin BREDEHORN und Gerhardt POWITZ (Frankfurt am Main: Klostermann, 1979). For angelic “names” in conjunction with magic squares, see Eleazar GUTWIRTH, “The Cuenca Amulet: History, Magic, and Manuscripts,” *Sefarad* 74:2 (2014) pp. 453-463.

¹⁰ Raphael PATAI, *The Jewish Alchemists: A History and Source Book* (Princeton: Princeton University Press, 1994) p. 234.

¹¹ David ROMANO, “En torno a Menahem, físico y alquimista judío de los reyes de Mallorca y Aragón (1344-1348),” in *XIII Congrès d’Història de la Corona d’Aragó. Comunicacions II* (Palma de Mallorca: Institut d’Estudis Balearics, 1989) pp. 95-101, and Antonio CONTRERAS MAS, *Los médicos judíos en la Mallorca bajomedieval. Siglos XIV-XV* (Palma de Mallorca: Moll, 1997) pp. 43, 45-50 and 133.

1387). Samuel Caracosa appears for the first time in 1367, as one of the secretaries of the *aljama* of Perpignan. Six years later, he appears again in an order issued by King Pere IV. King Joan I (1350-1396) ordered authorities not to obstruct Caracosa's alchemical projects.¹² Some decades later, we hear about Samuel of Granada who is accused of alchemical practices. *Ca.* 1416, the investigation of his possessions revealed "pólvores." He was accused that "usava fer alquímia."¹³ But the connection of Jews to alchemy in medieval Spain which constitutes the broader historical frame which can explain the existence of such an unexpected aljamiado text in the Houghton codex cannot be reduced to these three documented individuals.

Jews in medieval Spain read the *Kuzari*¹⁴ and the *Ḥovot ha-Levavot*, albeit in Hebrew translations. The *Ḥovot Ha-Levavot* (*Duties of the Heart*) contains a relatively sustained meditation by way of analogy on alchemy, as does the *Kuzari*. Neither is a treatise on alchemy, let alone practical instructions on it, but they show the familiarity with or interest in the subject as integral part of the culture.¹⁵ What needs to be added here is that this is not a purely twelfth century phenomenon. A translation into the *romance* of the *Kuzari*¹⁶ comes from this period (fifteenth century) so that these works are not only of interest for the eleventh and twelfth centuries, but also for their influence on -and the history of- reading in the fifteenth century. Joseph Albo, the philosopher who hailed

¹² On Caracosa, see PATAI, *The Jewish Alchemists: A History and Source Book*, p. 235ff. See also the letter of Pere IV (1/4/1384) who orders, concerning alchemical workers, "... que permitais a los antedichos hacer las citadas operaciones y experimentos en union de cristianos, judios o moros que con aquellos quisieren ocuparse de la dicha obra..." José Ramón DE LUANCO, *La alquimia en España* (Barcelona: Obelisco, 1889) p. 64.

¹³ Mark D. MEYERSON, "Samuel of Granada and the Dominican inquisitor: Jewish magic and Jewish heresy in post-1391 Valencia" in *Friars and Jews in the Middle Ages and Renaissance*, ed. Steven J. McMICHAEL (Leiden-Boston: Brill, 2004) pp. 161-189.

¹⁴ For the significance of late "readings," see Adam SHEAR, *The Kuzari and the Shaping of Jewish Identity, 1167-1900* (Cambridge-New York: Cambridge University Press, 2008).

¹⁵ PATAI, *The Jewish Alchemists*, ch. 11.

¹⁶ Moshe LAZAR and Robert DILLIGAN, (eds.), *Book of the Kuzari: A book of proof and argument in defense of a despised faith: a 15th century Ladino translation (Ms. 17812, B.N. Madrid)* (Culver City: Labyrinthos, 1990).

from the Crown of Aragon is an additional fifteenth century example of interest in alchemy.¹⁷ Somewhat different is the case of Simeon b Zemah Duran.¹⁸ He is undoubtedly late medieval (d. 1444), he was educated and matured in Mallorca and left it only after the events of 1391. It should be added that even in N. Africa he seems to be connected to a network of Catalano-Aragonese exiles like himself and continues his contacts with Mallorcan Jews through his rich correspondence. His *Magen Avot* is usually described as a medieval encyclopedia. In it,¹⁹ there is a relatively sustained section on alchemy. Apart from remarks on the immorality of some practitioners, there are descriptions/discussions of inorganic matter, minerals, metals, etc. The originality, surely, is evident at least in the use or creation of a defined semantic area in Hebrew. The importance of such a vocabulary was realized by the early scholars of Jewish alchemy.²⁰ His essay depends also on making choices as to the subject matter, the stones and metals he will discuss and those he will not. It is reminiscent in some ways of the lists and descriptions of minerals in the *Lapidarios* of Yehudah Ha-Cohen Mosca which, again, on a first encounter might be dismissed as unoriginal translations. Recent work has tried to show why this is not the case. In any event they discuss metals and their properties as does Duran.

Alchemy in late medieval Spain was linked to medicine.²¹ The borders between “Jewish” and “Christian” in this field are not hermetic but rather porous, as in other areas of late medieval Hispano-Jewish culture. While the evidence is not rich, an important element was the belief in the quintessence. Enrique de Villena, who, in his works, cites a number of Jewish sources (not yet found) refers to the quintessence in his commentary on the Psalm *Quoniam videbo*. In this passage he also refers to what he calls *mequbalin*.²²

¹⁷ PATAI, *The Jewish Alchemists*, ch. 23.

¹⁸ PATAI, *The Jewish Alchemists*, ch. 19.

¹⁹ Simeon Ben Zemah DURAN, *Magen Avot* pt. 2 (Leghorn, 1785) pp. 10 and 71.

²⁰ Robert EISLER, “Zur Terminologie und Geschichte der jüdischen Alchemie,” *MGWJ* 69 (1925) pp. 364-371.

²¹ Antonio CONTRERAS MAS, “Astrología, alquimia y medicina en Mallorca medieval” *BSAL* 56 (2000) pp. 89-102.

²² Eleazar GUTWIRTH, “Opera Digitorum Tuorum: Zacut and the Salamancan Heavens,” *Hispania Judaica Bulletin* 13 (2017) pp. 53-84.

He also refers to Rocacissa. Recent work has shown that Rocacissa was being read in the Jewish community of Segovia around the middle of the fifteenth century.²³

This brings us to the neglected case of Yanto [Shem Tov?] Aseo.²⁴ Yanto Aseo lived in Elche and the council of Alicante asked for his services as goldsmith. They promised to pay him well for his work. He went to Alicante with his tools. He worked for the council for three months making images and figures as he was asked to do by the masters of the art. He was also charged by the municipality to find “agua encantada” [“diz que avian de sacar agua encantada”] near the road to Alicante. He was promised fifty florins if he obtained the water, otherwise he would be well paid for his other work. In 1391 he left the town for Murcia, seeking refuge from the attacks.

Although “agua encantada” appears in a number of late medieval and early modern texts, it is generally a hazy concept. This might explain the lack of attention to the case of Yanto Aseo in studies of Jews and alchemy. The best known reference is in the *Quixote*. In the famous scene of the burning of the books by the local priest (I/VI) we read: “Que se quite todo aquello de la sabia Felicia, y de la agua encantada”: in Jorge de Montemayor’s *Diana*, the book’s reference to the “wise Felicia” and to the “agua encantada” have to be censored. It is reminiscent of Urganda in the Spanish *Amadís*, and her «agua encantada». Amadís was translated into Hebrew in the 1540s in Constantinople.

“Agua encantada” appears in medieval and early modern texts with an aura of vagueness: we do not know what it does. In the *Razon de amor*, ca. 1205, the first person narrator refers to a glass of fresh water. Though thirsty, he avoids it because it might be “agua encantada.”²⁵ Also in the thirteenth century, in the fourth part of the Alfonsine *General*

²³ Eleazar GUTWIRTH, “Jewish and Christian Messianism in XVth-Century Spain,” *Mediaevalia Lovaniensia* 26 (1998) pp. 1-22.

²⁴ Juan TORRES FONTES, “Los judíos murcianos a fines del siglo XIV y comienzos del XV,” *Miscelánea Medieval Murciana* 8 (1981) pp. 55-118.

²⁵ “Ariba del manzanar otro uaso ui estar. Pleno era d’un agua fryda que en el manzanar s[e] ñasia. beuiera d’el’a de grado mas oui miedo que era encantado;” Mario BARRA JOVER, (ed.), *Razón de amor: texto crítico y composición* (Madrid: Editora Nacional, 1978) pp. 123-153.

Estoria, it reappears in a more comprehensible guise. Ch LXVII “De como Nabuchodonosor enuio un su Rico omne con muy grand poder a tierra de Egypto & de lo quel mando que fiziesse.” There, “agua encantada” has the power to kill snakes (p. 89) and it is associated with Egypt and its *hechiceros*. A related usage comes from Mallorca and is linked to Adoart de Bosia, who sent the messengers of the king of Aragon, Alfonso the Magnanimous, an alchemical elixir or medical water [*cierta agua bona a curar totes les malalties*] which he had prepared in the Ermita de la Victoria in Alcudia (Mallorca).²⁶ A colophon at the end of a Hebrew MS of the fifteenth century, achieved near Segovia, refers to the waters of a river which solidify whatever is left there.²⁷ This seems similar to the idea voiced by Simon b Zemah Duran in his essay on alchemy in his *Magen Avot*: “And there are those that are water in the womb of the earth, and when they come out into the air they turn to stone.”²⁸ This evidence is sufficient to show the existence of Jewish involvement and interest in alchemy in late medieval Spain, and thus to provide a historical context for the interest in alchemy of the fragment in the Houghton MS. The next question would be whether its interest in armaments also has a background in Sephardi history.

3. ARMAMENTS

The *locus classicus* for discussions of Sephardi Jews and armaments is a book published in 1567, *Quatre premiers livres des navigations*. It is supposed to record its author’s (Nicholas Nicholay) observations about the Ottoman court and peoples from his 1551 mission to Istanbul on

²⁶ Juan MUNTANER BUJOSA, “Un agua medicinal prodigiosa para el rey de Aragón (1417),” en *IV Congreso de Historia de la Corona de Aragón (Mallorca, 25 septiembre-2 octubre 1955): actas y comunicaciones*. Vol. II (Barcelona: Diputación Provincial de Baleares, 1970) pp. 417-428.

²⁷ Eleazar GUTWIRTH, “Viajes y viajeros hispanojudíos en la Baja Edad Media,” en *Viajes y viajeros en la España Medieval: actas del V curso de cultura medieval celebrado en Aguilar de Campoo (Palencia) del 20 al 23 de septiembre de 1993*, coords. José Luis HERNANDO, Miguel Ángel GARCÍA GUINEA y Pedro Luis HUERTA HUERTA (Aguilar de Campoo: Fundación Santa María la Real–Centro de Estudios del Románico, 1997) pp. 293-308.

²⁸ PATAI, *The Jewish Alchemists*, ch. 19.

behalf of the French government. The book served as a survey of customs in the Ottoman world, and was believed to be one of the earliest and most accurate depictions of the Islamic world to appear in Europe. It was later reissued and translated in Italy, the Netherlands, England, and Germany. It is divided into four books, following Nicholay's voyage to Istanbul, accounts of ethnic groups and Ottoman court life, and the religious and military administration in Istanbul. He referred to the

... marranes, n'a pas longtemps bannis et déchassés d'Espagne et Portugal, lesquels, au grand détriment et dommage de la Chrétienté, ont appris au Turc plusieurs inventions, artifices et machines de guerre, comme à faire artillerie, arquebuses, poudre à canon, boulets et autres armes ...²⁹

Nicholay's assertion that "the marranos" were expelled in 1492 would seem, at first sight, a proof of his unfamiliarity with Spanish and Jewish history and, therefore, a reason for ignoring him. But travel literature of this period is commonly problematic and not only in his case, as has been recently shown after reading other sixteenth century texts of Mediterranean travel.³⁰ There is the problem of the travelers' linguistic skills or of the use of previous writings presented as genuine observations. Bataillon showed long ago, in the case of the *Viaje de Turquía*, which expresses the same notion of Sephardi involvement in weapons for the Ottomans, how much of it (like Nicholay) rewrites previous travel accounts such as those of Menavino, Bassano, Spandugino, Busbeq, Georgevitz and others.³¹ More recently, the notion of the *Viaje's* derivative quality has been reaffirmed by Prospero: "possiamo affermare...che l'idea del *Viaje* come testo ingenuamente veriterio...[è] veramente insostenibile."³²

²⁹ Nicolas DE NICOLAY, *Dans l'Empire de Soliman le Magnifique*, eds. Marie-Christine GOMEZ-GÉRAUD and Stéphane YERASIMOS (Paris: Presses du CNRS, 1989) p. 233.

³⁰ Eleazar GUTWIRTH, "Tres calas en la literatura de viajes del siglo XVI," in *Viajes a Tierra Santa: navegación y puertos en los relatos de viajes*, ed. Tania María GARCÍA ARÉVALO (Granada: Universidad de Granada, 2014) pp. 67-90.

³¹ Marcel BATAILLON, *Laguna, auteur du Voyage en Turquie* (Paris: Librairie des Éditions Espagnoles, 1958) and "Andrés Laguna, auteur du Viaje de Turquía, à la lumière de recherches récentes," *Bulletin Hispanique* 58:2 (1956) pp. 121-181.

³² Corsi PROSPERI, "Sulle fonti del Viaje de Turquía," *Critica storica* 14 (1977) pp. 66-90: 75, and Marie-Sol ORTOLÁ, *Un estudio del "Viaje a Turquía": autobiografía o*

In the *Viaje*, as elsewhere, artillery is by no means the only technical skill that is being discussed.³³ In addition, in sixteenth century Europe, the idea that the exiles brought with them skills in the field of armaments to the Ottoman empire is by no means restricted to Nicholay as has been seen. Veinstein, who has addressed the question³⁴ asserts

... the findings of a Danish historian, Stephen Christensen, ... deserve full attention... to confirm the falsehood of the allegation against the Marranos and, consequently, *the validity of Christensen's hypothesis, it is important to do a double-check and consider whether there was clear evidence for a significant Jewish involvement in the field of artillery ... in pre-expulsion Spain ...* As far as the Spanish documentation is concerned – admittedly, my inquiry remaining very much limited – I only could find mention of the Jew Samuel Ravatoso, an expert in the new firearms, who around 1430 was the chief of the artillery of the king of Navarra ...

That is to say that the problem of the value of Nicholay's assertions is not so much one of early modern French letters as of Iberian (pre-1492) history. What is important in Veinstein's analysis is the realization that one cannot explain or assess Nicholay's stance purely by attributing it to some individual, personal quirk, not even his antisemitism. Scholarly attention has shown how widespread the idea was in the sixteenth century. While the notion that research must concern itself with the evidence for Jewish involvement with armaments in pre-expulsion Spain is clearly useful, it should be pointed out that Ravatoso was not an obscure personality in the late middle ages. Carrasco has found documents on the family concerning real estate which show that his was one of the seven families which con-

ficción (London: Tamesis, 1983). Its paragraph on Hispano-Jewish involvement in armaments reads: "Mátalascallando: ¿De artillería es bien proveído? Pedro: No lo solía hacer, ni tenía maestros que los enseñasen, principalmente el encabargar las piezas en carretones hasta que echaron los judíos de España, los cuales se lo han mostrado, y el tirar de escopetas, y hacer de fuertes y trincheras y todos cuantos ardidres y cautelas hay en la guerra, que no eran antes más que unas bestias."

³³ For the attitude to weapons, see Moti BENMELECH, "History, Politics, and Messianism: David Ha-Reuveni's Origin and Mission," *AJS Review* 35:1 (2011) pp. 35-60.

³⁴ Gilles VEINSTEIN, "The Ottoman Jews: between distorted realities and legal fictions," *Mediterranean Historical Review* 25 (2010) pp. 53-65, and Daniel JÜTTE, *The Age of Secrecy: Jews, Christians, and the Economy of Secrets, 1400-1800*, translated by Jeremy RIEMER (New Haven, CT: Yale University Press, 2015) especially ch 2.

stituted the most elevated strata of Jewish society in Tudela.³⁵ Béatrice Leroy's documents amplify considerably our knowledge of the personality, his functions and his context: "... 1430 ... Samuel Ravatoso dirige les réparations effectuées par Johan Peynado l'arbalétrier, et surtout fait assembler des leviers et des châssis (pour les canons ?)."³⁶

But the cases of Navarran Jews engaged in the field of armaments are by no means unique.³⁷

³⁵ Juan CARRASCO, "Bienes raices de judíos en Tudela y su merindad (1348-1381)," in *Proceedings of the Ninth World Congress of Jewish Studies, Jerusalem, August 4-12, 1985* (Jerusalem: World Union of Jewish Studies, 1986) pp. 97-103.

³⁶ She cites a primary source: "... et Semuel Ravatoso, Judio, el qual apresent vive con el Seynor Rey por ciertas artificerías que el sabe fazer a causa de la guerra...". She explains also that: "On enrôle de quatre à neuf charpentiers et autant de maçons dans les trois chantiers à tour de rôle, trois à cinq brassiers, deux à trois muletiers, par hasard une ou deux femmes, deux spécialistes des fours (Pascal de Calla et Martin d'Ivirizu, d'Estella); on paie le travail d'«un Juif» de la ville, ciseleur et fabricant les clous nails et les chevilles pegs de fer. Il faut y joindre plusieurs arbalétriers, maîtres en fer de lance et en empennage de flèches, et quelques artificiers dirigés par le Juif de la ville (ou plutôt originaire de Tudela) Samuel Ravatoso, car les châteaux d'Estella sont des arsenaux d'artillerie blanche et à feu;" Béatrice LEROY, "Les grands chantiers publics en Navarre sous la dynastie d'Evreux (1328-1430)," *Cahiers de la Méditerranée* 31 (1985) pp. 55-71 and "Entre deux mondes politiques: les Juifs du royaume de Navarre à la fin du Moyen Age," *Revue Historique* 275 (1986) pp. 29-37.

³⁷ In an inquiry such as this, the Portuguese case is also relevant; François J. F. SOYER, "Living in Fear of Revenge: Religious Minorities and the Right to Bear Arms in Fifteenth-Century Portugal," in *Vengeance in the Middle Ages: Emotion, Religion and Feud*, eds. Susanna A. THROOP and Paul R. HYAMS (Farnham: Ashgate, 2010) pp. 85-104. In 1366, the Jews of Lisbon and Santarem were ordered to have horses and weapons. They protested to the Crown that the Christians forced Jews to serve on the frontiers of the kingdom and guard prisoners, monies and places to which they were not used to go and that they were badly treated by the Christians who were with them. In response Pedro I (1357-1367) ordered the municipal judges not to force Jews to perform duties at the frontier, to ill-treat them or permit them to be so treated. But the king did not exempt them from military service. That year the same privileges were given to the Jews of Setubal, Beja, Coimbra and Santiago de Cacem. The privilege granted to the Jews of Setubal mentioned that they were only to guard the King's tents and treasure. Although it is not my subject here, it could be mentioned that Iberian judeo-conversos in Italy, particularly in Ferrara, in the time of Amatus Lusitanus, traded in sword blades. See Eleazar GUTWIRTH, "Universae gentis nostrae...: Amatus in Context," in *Praxi theorematata coniungamus: Amato Lusitano y la medicina de su tiempo*, ed. Miguel Ángel GONZÁLEZ MANJARRÉS (Madrid: Escolar, 2019) pp. 49-79.

It would be wrong to attribute the scholarly scepticism about Jewish involvement in weapons to a purely modern sensibility. The idea that Jews did not have contact with weapons existed and is attested in late medieval Iberia. In 1392, a provision by Joan I of Aragon orders that, in pageantry, the Moors of Huesca should have precedence over Jews because of the former's help for the monarch with weapons, implying that the Jews provided no such help.³⁸ The profound suspicions of present day readers of Nicholay and analogues has itself old roots. The *Shevet Yehuda* – printed around the mid sixteenth century – presents the question of Jews and armaments as being of interest to scholastic Christians and a topic for their discussions at the royal court:

... originally while the Jews found favor in the eyes of God, He would fight their wars, as it is known to all ... Therefore they did not learn the ways of war for they did not need them ... and when they sinned God turned away his face from them and they thus remained losers on all counts – they were ignorant of weapons of war and its invention, and the will of God was not with them; they remained naked and fell like sheep without a shepherd ...³⁹

As usual, the chronicle, in a paragraph using *oratio recta*, has an ambiguous relation to reality. But it presents the topic as the view of Tomás: an individual's opinion rather than that of Christianity as a whole. Without attempting a full analysis of the chronicle, it should be clear that the figure of Tomás in it is far from that of an ideal intellectual or theologian. On the contrary, he is frequently ridiculed in the text. There is perhaps an awareness that the attitude is contradictory and that attitudes are multiple: whether the Jews could not⁴⁰ or would

³⁸ Jaime RIERA, “La precedencia entre judíos y moros en el reino de Aragón,” en *Judaísmo hispano: estudios en memoria de José Luis Lacave Riaño*, ed. Elena ROMERO (Madrid: CSIC, 2002) vol. II, pp. 549-560.

³⁹ *Shebet Yehudah*, eds. Azriel SCHOCHAT and Yitzhak BAER (1947) p. 44. I am not aware of interpretations of this passage as polemics against the notions in Nicholay, the *Viaje* or their precedents and analogues.

⁴⁰ The evidence contradicts generalizations. The stereotype of cowardice would lie behind the exemption from military service in some Portuguese locations, ordered by Joao II, according to Maria José Pimenta Ferro TAVARES, *Os judeus em Portugal no século XV* (Lisboa: Universidade Nova de Lisboa, 1982. 2 vols) vol I, p. 26 and p. 40, nt. 40. TAVARES (*Os judeus em Portugal no século XV*, vol. I, p. 40, nt. 41) documents cases of Jews serving the

not,⁴¹ should or should not bear arms⁴² were all positions⁴³ attested in late medieval Iberia.

Fifteenth century attempts to order the Jews to carry arms and maintain horses were understood by Torres Fontes as attempts to incorporate the Jews into chivalry. From the royal chancery in Castile there emanated the argument that such attempts were unrealistic. The 1460 letter of Enrique IV⁴⁴ argues that Jews never had horses, that they “biven de otras maneras” and that “sus officios non son por armas ni biven por ellas.”

king in military capacities (see below). Literary sources are also contradictory. A poem in the *Cancioneiro Geral* refers to Jews as fighting. Others [Gil Vicente] deny that possibility. According to SOYER (“Living in Fear of Revenge”), in the fifteenth century, in Portugal, it can be inferred that the Jews continued to be liable for military service to the Crown since a law of 1422 exempted Jewish converts to Christianity from having to appear for muster.

⁴¹ SOYER (“Living in Fear of Revenge”), writing about Portugal, asserts that the laws of Joao I and Prince Pedro forbade Jews and Muslims from carrying weapons in public. Nonetheless, an exception was made when arms were carried in the service of the Crown.

⁴² As early as Israel ABRAHAMS, *Jewish Life in the Middle Ages*, ed. Cecil ROTH (London: Edward Goldston, 1932) p. 402, we find some minimal awareness of the evidence. Thus, he mentions that in 1390 the Jews of Mallorca were forbidden to carry arms; in 1412 Jews in Castile were forbidden to carry swords and daggers; in 1481, in Portugal there was criticism of the Jews because they ride on finely caparasoned horses and mules in fine clothes and gilded swords.

⁴³ Of interest is the position of Abraham b Eliezer Ha-Levi in the early sixteenth century, especially if we bear in mind his Toledan origins and his family relation to Abraham Zacut of Salamanca. He represents the intellectual elite of Castile. In a paragraph selected and translated by BENMELECH (“History, Politics, and Messianism”), Abraham avers “And they brought with them many catapults and destructive weapons with fire and sulphur, and the king of Persia was with three hundred and fifty thousand cavalymen. And the Turkish king camped close to him and launched all the catapults and the destructive weapons with fire together against the Persians and they turned their horses around to flee.” He obviously thinks that weapons are a prime factor in history. His view is that modern weapons are superior and determine the outcome of conflicts. He pays attention to different attitudes (such as contempt) to armaments in his analysis of politics.

⁴⁴ Juan TORRES FONTES, “La incorporación a la caballería de los judíos murcianos en el siglo XV,” *Murgetana* 27 (1967) pp. 5-14. Appendix: “... Los quales diz que nunca fue vso ni costunbre en la dicha cibdad ni en las otras cibdades e villas e lugares que son en frontera de moros, ni en las otras que non están en frontera, asy porque los dichos judíos biven de otras maneras e tratos que los christianos, como porque sus officios non son por armas ni biven por ellas para que oviesen de tener e mantener cavallos. El que sy ellos por fuerça e contra su voluntad ovieren de tener los dichos cavallos, perderian por ello sus faziendas e menesteres de que biven e se mantienen e allende de los traba-

Signed by various royal secretaries, registered by the chancellery with the approval of the royal council, the argument nevertheless rehearses old ideas, as has been shown, and seems to originate in the recently studied supralocal, centralized institution of the general Castilian Jewish “procurador.”⁴⁵

How accurate a description of reality is the argument? It may be seen as a generalization about a majority of cases. It may also be seen as an argument against raising taxes. But, as it is addressed specifically to Murcia, it may also be seen within the context of the notorious ongoing tensions between royalty and Murcian authorities at the time.⁴⁶ It has affinities with the arguments articulated in the *Shevet*: both assume that Jews are not involved in armaments; that these are foreign to their culture.

Archival documents leave no doubts as to the existence of Jewish craftsmen involved in arms and armour. They also document Jewish possession of arms and similar items. In 1432 the inventory of the possessions kept in the house of Moses Benjamin in Tudela yielded 14 swords, 8 daggers, 8 crossbows, 4 cuirasses.⁴⁷ In the 1360s, the Jew Yahuda crafts spear tips and knives. In 1382, a Jew helps the council of Orihuela by remaining in the town and practicing his work of repairing or improving [*adobar*] *sillas* [harnesses rather than chairs], *corazas* [cuirasses, armor] and “other weapons.”⁴⁸ In 1429, Jews of Murcia, such

jos que tienen e padecen por razón de los servicios e cabezas de pechos con que me syrven e dan e pagan en cada año ...”

⁴⁵ Eleazar GUTWIRTH, “Trends towards Centralization in XVth c. Castilian Jewish Communities” [in Hebrew], *Te’udah* 4 (1986) pp. 231-246. The richer evidence for Portugal is also earlier. The similarity of the situations has not been noticed but seems clear. See note above.

⁴⁶ Javier QUINTEROS CORTÉS, “Los genoveses, el adelantado Pedro Fajardo y Enrique IV: comercio, fraudes y ambiciones territoriales en el Reino de Murcia (1454-1474),” *Anuario de Estudios Medievales* 41 (2011) pp. 99-123.

⁴⁷ Juan CARRASCO, “Los bienes de fortuna de Mosse Benjamín judío de Tudela (1432),” *Príncipe de Viana* 189 (1990) pp. 89-112: 96.

⁴⁸ Agustín NIETO FERNÁNDEZ, *Orihuela en sus documentos* (Murcia: Espigas, 1997. 4 vols) vol 4, pp. 22ff, and 25: Mahir Çalema *frenero* is granted help by the council for his rent in 1448; the council also pays him for two items of artillery (*bombardetas*) he forged with his iron for the defense of the city in 1467.

as Abeniatar and also Yuçaf, sell sulfur for making gun powder.⁴⁹ The Jew İçaq sells 8 pounds of sulfur “*para fazer polvora para las lonbaldas*.”⁵⁰ In 1407, the town council of Murcia needed weapons for the defense of the city and had to borrow them from the Jews. Special care was taken to register them so as to return them later.⁵¹ In 1432, a document is extended by the Bayle General of Valencia to Yafuda Maymo of Sagunto allowing him to bear sword and shield.⁵² After Velez Blanco was conquered by Alfonso Yáñez Fajardo in 1436, his widow left four Jews [among others] to defend the town. In 1447 the Jew Çalema is engaged in the construction of a *lonbarda* or smoothbore cannon.⁵³ In 1477 the Jews of Murcia complain that their *espingardas* /shotguns had been sequestered.⁵⁴ The council orders thirty to be returned to them. The hostage taking of the fifteenth century gave rise to law suits about torture and theft as in the case of Shlomoh Aliulieh whose weapons were stolen by unnamed partisans of Fajardo.⁵⁵ A document of 1411 reveals the case

⁴⁹ LUIS RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)* (Murcia: Universidad de Murcia, 1992) p. 122.

⁵⁰ RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p. 121.

⁵¹ Another case of Jews collaborating in the defense of a city alongside their fellow townsmen would be that of Calahorra. Along other city dwellers, the Jews helped in the city's efforts during the siege by the French; Enrique CANTERA MONTENEGRO, “Los últimos tiempos de la presencia judía en Calahorra y La Rioja,” *Kalakorikos* 10 (2005) pp. 57-86.

⁵² José Ramón HINOJOSA MONTALVO, “Artesanía y artesanos judíos en el reino de Valencia durante la Edad Media,” en *Judaísmo hispano: estudios en memoria de José Luis Lacave*, ed. Elena ROMERO (Madrid: CSIC, 2003) vol. 2, pp. 621-648: 642.

⁵³ RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p. 20.

⁵⁴ RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p. 155. Abundant evidence on Jewish *espingardeiros* was preserved in Portugal: Moises Faras *mestre de fazer espingardas* in Estremoz appears in 1475 and 1482; Salomao Curcim of Beja in 1478; Moises Crescente *fazedor de polvora de Castela* in 1486; Salomao Canes *espingardeiro do rei*, of Trancoso, in 1492. See TAVARES, *Os judeus em Portugal no século XV*, vol. II p. 600. See also vol. I, p. 307: Salomao Folega receives 3000 reais *por saber muy bem fazer muytas coussas d'artelharia da guerra*.

⁵⁵ RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p. 39. In 1472 Aventuriel demounces those who stole a *lanza* from his shepherd: RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p.106. Also in 1472, there is a complaint against the *merino* who stole a *lanza* and an *adarga* (leather shield) from the Jew Santaren; RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p. 136.

of Yanto Alfatex, victim of theft. Amongst other items stolen by the thieves were a horse *ensellado e enfrenado* as well as *una lança e una espada e un punnal*.⁵⁶ In 1407, the council of Murcia was told by Antonio Gonzalo that the Jews had many weapons.⁵⁷

4. THE LANGUAGE OF ALCHEMY AND ARMAMENTS

The texts at the end of the Houghton MS are in *aljamía*. It is not Spanish/Castilian *aljamía*. The ubiquitous */pren/* alerts us to the fact that the underlying language is Catalan. Contreras Mas has underlined in a number of articles the centrality of Mallorca in Iberian alchemy in this late medieval period. The royal court certainly seems to have been interested in Mallorcan alchemy and alchemists. The examples of Menahem, Caracosa, Samuel of Granada, Albo, Simeon b Zemah Duran come from the Crown of Aragon, especially the (former) Kingdom of Mallorca-Rousillon. The contents of the Houghton text in Judeo-Catalan *aljamía* recall the works in Catalan ascribed to Arnau de Villanova. Cifuentes,⁵⁸ who has studied the pseudo-Villanova texts as sociolinguistic documents, emphasizes the burgherly and lay character of the public of scientific texts in Catalan. The Houghton text is concerned with

⁵⁶ RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p. 41.

⁵⁷ RUBIO GARCÍA, *Los judíos de Murcia en la baja Edad Media (1350-1500)*, p. 89.

⁵⁸ For the case of Catalan in Latin characters, see Lluís CIFUENTES I COMAMALA, “Les obres alquímiques arnaldianes en català a finals de l’Edat Mitjana,” in *Actes de la II Trobada Internacional d’Estudis sobre Arnau de Vilanova*, ed. Josep PERARNAU (Barcelona: Institut d’Estudis Catalans, 2005) pp. 129-150. See also Michela PEREIRA and Barbara SPAGGIARI, *Il “Testamentum” alchemico attribuito a Raimondo Lullo. Edizione del testo latino e catalano conservato nel manuscritto Oxford, Corpus Christi College, 244* (Firenze: Ed. del Galluzzo, 1999); Michela PEREIRA, «Cap als orígens de l’alquímia a medieval. Presència d’alquímistes i desenvolupament de les doctrines de l’Alquímia a les Illes Balears (segles XIII-XV),” in *Història de la Ciència a les Illes Balears* (Palma de Mallorca: G. I. Balears, 2006) vol. I, pp. 153-169 and “Alchemy and the use of vernacular language in the late Middle Ages,” *Speculum* 74 (1999) pp. 336-356, and Lola BADIA PÀMIÉS, *Textos Catalans Tardomedievals 1 “Ciencia De Natures” discurs llegit el dia 21 de novembre de 1996 en l’acte de recepció pública de Lola Badia Pàmies a la Reial Acadèmia de Bones Lletres de Barcelona i contestació de l’acadèmic numerari Josep Romeu i Figueras* (Barcelona: Reial Acadèmia de Bones Lletres de Barcelona, 1996). My thanks to Prof. Dr. José Ramón Magdalena Nom de Déu for his paleographic help.

themes which are reminiscent of those which engaged the pseudo-Arnau writings. These themes are *sublimar*, *mercuri*, *armoniach*, *sofre*. Indeed, the table of contents of a pseudo-arnaldian text reads: 1. “*Per subimar los spirits [volàtils]. Primerament, del mercuri. Sublimatió del sofré. Sublimatió de arsènich. Sublimatió de rialguar. Sublimasió de sal armoniach.*” These are also the themes treated in the *aljamiado* text. The Houghton texts offer a rich vocabulary of objects or utensils: *una escudella* [fol. 112r]; *amortella*, *alanbic*, *cresol* [fol. 112v]; *bastonet*, *cassola*, *un marbre*, *carabe*, *paieta*, *filtre* [fol. 111v]. They testify to the weight measurements current in their time and place: *adramme* [fol. 112r]; *unça* [fol. 111v].⁵⁹ They are concerned with sulfur, one of the components of gun powder alongside charcoal and potassium nitrate (saltpeter): “*pren un pes de fin sulfur*” [fol. 112r].

Of particular interest are the instructions for gun powder of *colobrina* or *culebrina*, a piece of artillery mentioned as early as the first half of the fifteenth century: “... *e met de una en una e com més l’hi metràs pus alt serà pòlvora per colobrina ...*” [fol. 110v]. The same may be said about the instructions concerning the *espingarda*, a weapon with long barrel known in Byzantium since the XIth c. and in Western Europe since the XIIth-XIIIth c. “... *quatre e mija de sal nitre una de sofré viu una e de carbó de salsar per espingarda ...*”⁶⁰ [fol. 110v].

⁵⁹ For the *dirhem* in [the non-Iberian, tenth century] Yefet, see Meira POLLIACK, “Historicizing Prophetic Literature: Yefet ben ‘Eli’s Commentary on Hosea and its relation to al Qumisi’s Pitron,” in *Pesher Nahum: Texts and Studies in Jewish History and Literature from Antiquity through the Middle Ages Presented to Norman (Nahum) Golb*, eds. Joel L. KRAEMER and Michael G. WECHSLER, with the participation of Fred DONNER, Joshua HOLO and Dennis PARDEE (Chicago: University of Chicago, 2011) pp. 153-190.

⁶⁰ *Espingardas* were also used in celebrations as in the case of Miguel Lucas de Iranzo, the Condestable, ca. 1462. By the 1470s they become common in warfare; cf. José A. VALVERDE, “Sobre la autoría del Tratado de montería del siglo XV,” *Revista de Literatura Medieval VIII* (1996) pp. 229-237: 233. Numerous *espingardas* and *lombardas* are documented in the lists of shipping cargo of the late fifteenth century and amongst the supplies sent to the New World in the early sixteenth century; cf. Miguel Ángel LADERO QUESADA, *La Armada de Flandes. Un episodio en la política naval de los Reyes Católicos (1496-1497)* (Madrid: Real Academia de la Historia, 2003) and «La armada de Vizcaya (1492-1493): nuevos datos documentales,” *En la España Medieval* 24 (2001) pp. 365-394; Aurora LADERO GALÁN and Miguel Ángel LADERO QUESADA, “Ejércitos y armadas de los Reyes Católicos: algunos presupuestos y cuentas de gastos entre 1493 y 1500,” *Revista de Historia Militar* 92 (2002) pp. 43-103, and Miguel Án-

5. CONCLUSION

The text in the Houghton MS is not in Hebrew but in the vernacular in Hebrew characters. The presence, in a thoroughly Christian, Italian MS in Latin characters, of pages in Hebrew character *aljámia* is – to say the least – surprising. Neither does the Italian MS exhibit interest in alchemy or armaments. It differs then from the numerous vernacular texts on alchemy in medieval MSS which are in Latin characters. The difference is by no means purely linguistic but also social. It is also cultural as it establishes differences between those with access to such technical texts and those without. Its formal type is that of instructions or recipes rather than poetry, commentaries, allegory, etc. Its existence reinforces the suggestion about a dominant trend in the culture of the Jews of Catalonia in the late middle ages advanced some years ago.⁶¹ It was an emphasis on *Sachliteratur* and *Fachliteratur* in the vernacular of the Jews of that time and place. Its relation to Hebrew and Judeo Arabic texts has to take into account the difference between languages but also the fact that minerals had been discussed in the vernacular *Lapidarios* by Mosca and that Hebrew texts on alchemy may switch occasionally their language to the *romance* vernacular. The involvement in alchemy in Hispano-Jewish communities is attested not only in “literary” philosophical texts but also in documented cases of individuals engaged in alchemy. Not all of these are well known.

The references to weapons inevitably raise the question of Jews and armaments in late medieval, i.e. pre-expulsion, Iberia. Discussed some-

gel LADERO QUESADA, “Dotación y aprovisionamiento de armadas enviadas a las Indias 1495-1519,” in *Actas del Congreso Internacional V Centenario de la Muerte del Almirante: Valladolid. 15 a 19 de mayo de 2006*, coords. Jesús VARELA MARCOS, María MONTSERRAT and León GUERRERO (Valladolid: Universidad de Valladolid, 2006) vol. 2, pp. 31-66. In Portugal, the *espingardeiros* become visible in the Tangiers’ campaign of 1437. The Chancelaria de D. João II, contains letters of privilege granted to *espingardeiros*. In the Batalha de Alfarrobeira of 1449 they appear as an established military group; cf. Pedro Filipe FERNANDES SEBASTIÃO, “O estudo de um corpo militar: os espingardeiros (c.1437- 1518),” *Incipit* 7 (2018) pp. 88-99.

⁶¹ Eleazar GUTWIRTH, “Tendencias en la cultura judeocatalana medieval,” in *Temps i espais de la Girona jueva*, coord. Silvia PLANAS MARCÉ, rev. Lídia DONAT PÉREZ and pres. Anna PAGANS I GRUATMONER (Girona: Patronat Call de Girona, 2011) pp. 139-156.

times in relation to writers such as Nicholay, it is nevertheless a clear case of late medieval Iberian Jewish history. Less clear is the attitude towards weapons and towards Jews bearing arms. A variety of attitudes in the evidence about Jews and Christians has been underlined here. The fragment's instructions in Judeo-Catalan *aljamía* show the interest in alchemy and weapons and the links between them in what is a text produced by a Jewish scribe of the late middle ages.

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