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Scholars of Andalusian Origin and their Contribution to Ottoman Science

Ekmeleddin İhsanoğlu

Abstract: This survey study reveals hitherto unknown aspects of scientific exchange between Andalusian and Ottoman scholars. The first outcome of these aspects came out during the long years of surveying, compiling and editing of the 18 volumes of Ottoman Scientific Literature which unveiled information about the emigration a number of Muslim and Jewish scholars to the Ottoman Empire after the fall of Granada (1492). Scholars of Arab origin mainly settled in North Africa and the province of Egypt, while the Jewish settled mostly in İstanbul and Salonica. These scholars produced works in order to prove their abilities and to be accepted by scholarly circles. Through these works, Ottoman scholars came into contact with new sources including the tradition of the "*Renaissance*" which was unknown to them. Some of these scholars were encouraged and given imperial patronage and some of the physicians rose to the position of palace physician to Suleyman the Magnificent.

This paper gives a detailed account on life and works of the Andalusian scholars who came to Ottoman Empire in different waves of immigration as well as it tries to shed light on the later comers and their interaction with Ottoman scholars.

Keywords: Ottoman Scientific Literature, Andalusian scholars, Ottoman scholars, Jewish scholars, scientific activities in Ottoman lands.

Introduction

Ever since it was first established, the Ottoman Empire attracted scholars from the other Muslim lands. A number of scholars from the old cultural and scientific centers of the Islamic world came to teach in the first Ottoman *medreses* which

were founded in Anatolia. The first medrese built by Ottomans in the newly administered areas was established in İznik in 1331. Few decades later in Rumelia (the European part of the Empire) the first four medreses were established between 1362 and 1389[1]. These scholars enriched Ottoman scholarly life and scientific literature with their works. Taşköprülü-zāde's (d. 1516) biographical dictionary titled *Şakāyık* and its supplements, which include the biographies of the Ottoman *'ulamā'*, are among the sources that substantiate this fact. However, these examples are mostly related to scholars that travelled between Anatolia and Rumelia and on the axes of Iran-Turan and Damascus-Egypt.[2]

Eighteen volumes on Ottoman Scientific Literature published during the last three decades provides ample evidence for scientific and scholarly exchanges between scholars living in different parts of the Ottoman Empire and the neighboring countries. One discovery made as a result of these detailed surveys of scientific literature concerns the imigration of scholars from Andalusian origin and the contributions they made.[3]

Examples of the contributions made to Ottoman science, as seen in these new sources, will be the main subject of this article. However, as will be shown below, it appears that this tradition of scientific contact between Andalusia and Anatolia also existed in the pre-Ottoman period when the latter was under Byzantine and then Seljukid rule. In this context, three early contacts will be briefly mentioned:

1. Arab scholars in al-Andalus who studied medicine and botany were interested in the *Materia Medica* written in Greek by Dioscorides. An illuminated

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[1] On this subject see Ekmeleddin İhsanoğlu, "Emergence of the Ottoman Medrese Tradition", *Archivum Ottomanicum*, v. 25 (2008), [283]-338. On teaching rational sciences see Ekmeleddin İhsanoğlu, "Institutionalisation of Science in the Medreses of pre-Ottoman and Ottoman Turkey", *Turkish Studies in History and Philosophy of Science,* ed. by Gürol Irzık & Güven Güzeldere.Netherlands: Springer, 2005, 265-283.

[2] *Şakaik-i Nu'maniye ve Zeyilleri*, 1-V, ed. Abdulkadir Özcan, Istanbul, 1989.

[3] For a summary on Ottoman scientific institutitons and literature in English see: Ekmeleddin İhsanoğlu, *History of Ottoman State, Society and Civilization*. Vol. II, 361-512, 519-593. For early contacts with European science and technology see Ekmeleddin İhsanoğlu, "Ottoman Science in the Classical Period and Early Contacts with European Science and Technology", *Transfer of Modern Science & Technology to the Muslim World*, ed. Ekmeleddin İhsanoğlu, İstanbul: IRCICA, 1992, 1-48. Ekmeleddin İhsanoğlu, "Some Remarks on Ottoman Science and its Relation with European Science & Technology up to the End of the Eighteenth Century*", Journal of the Japan-Netherlands Institute III. Papers of the First Conference on the Transfer of Science and Technology between Europe and Asia since Vasco da Gama 1498-1998* (Amsterdam/Leiden, 5-7 June 1991). Tokyo, 1991. Some of the eighteen volumes on Ottoman Scientific Literature used in this article are refered to in abbreviation given in italic letters next to the concerned scholar's name. Abbreviations are listed with others in a table.

manuscript of this work was presented by the Byzantine emperor Constantine VII to Caliph ʿAbd al-Raḥmān III (300/912-350/961). In 340/951, the Caliph invited a Byzantine monk by the name of Nicholas to work on the text with a team of Andalusian physicians, led by Ḥasdāy b. Shaprūṭ, the Jewish vizier, palace physician and treasurer. Their task was to identify the correct Arabic names for simple drugs which the Eastern translator, Iṣṭifan ibn Bāsil, had merely transliterated from their original Greek form. This process was summarised by Ibn Juljul in a book entitled *Tafsīr asmā' al-adwiya al-mufrada min Kitāb Dioscorides* – to which he later added *Maqāla fī dhikr al-adwiya allatī lam yadhkur-hā Dioscorides* – containing information on simple drugs which he had obtained from other sources.[4]

2. Ibn al-Bayṭār al-Mālaqī (d. 646/1248) was educated in Seville and emigrated to the East some time after 617/1220. He crossed North Africa (Morocco, Algeria and Tunisia) and most probably arrived in Anatolia by sea. In a sense, he was reciprocating Nicholas' visit. Whilst there, as Ibn Abī Usaybīʿa wrote, "he contacted people knowledgeable about *Materia Medica* and collected information about numerous plants". He made corrections to Dioscorides' writings based on the new information he had collected, while also writing his own work. Ibn al-Bayṭār travelled to the cities of Antalya, Antakya and Diyarbakır in Anatolia, and visited Syria and Egypt before finally settling in Cairo.[5]

3. Muḥyī 'l-Din b. al-ʿArabī (d. 638/1240) of Murcia (Mursiya) was a contemporary of Ibn al-Bayṭār al-Mālaqī, whose travels to Anatolia had extensive religious and intellectual ramifications. He went to Mecca in 600/1204 where he met pilgrims from the cities of Konya and Malatya. Between the years 600/1204 and 627/1230, he stayed on different occasions in the cities of Malatya, Konya, Aksaray and Sivas and was greatly honoured by the Seljuk sultan, Ghiyāth al-Dīn

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[4] Juan Vernet, "Los médicos andaluces en el 'Libro de las generaciones de los médicos' de Ibn Ŷulŷul" in Vernet, *Estudios sobre Historia de la Ciencia Medieval*. Barcelona-Bellaterra, 1979, pp. 469-486. The works of Ibn Juljul have been analysed in the Ph.D. thesis of Ildefonso Garijo, *La obra científica de Ibn Ŷulŷul*. Universidad de Córdoba, 1991. See also Garijo, "El tratado de Ibn Ŷulŷul sobre los medicamentos que no mencionó Dioscórides" in *Ciencias de la Naturaleza en al-Andalus. Textos y Estudios* I (Granada, 1990), 57-70 (English translation in M.I. Fierro and J. Samsó, eds., *The Formation of al-Andalus. Part 2: Language, Religion, Culture and the Sciences*. Ashgate-Variorum, Aldershot, 1998, 419-430); Garijo, *Ibn Ŷulŷul, Tratado Octavo*. Córdoba, 1992. Albert Dietrich has also published another edition (with German translation) of Book 8 in Dietrich, *Die Engänzung Ibn Ğulğul zur Materia Medica des Dioskurides*, Göttingen, 1993. Finally Garijo has reconstructed Ibn Juljul's explanation of the Greek names of simple drugs in Garijo, *Ibn Ŷulŷul, Libro de la explicación de los nombres de los medicamentos simples tomados del libro de Dioscórides*. Córdoba, 1992.

[5] "Ibn al-Bayṭār", *İA*, V/II, 845.

Kaykhusraw I. During the following years, Ibn al-ʿArabī travelled to Jerusalem, Cairo and Mecca, before returning to Konya in 606/1209-10. There he wrote his work titled *Risālat al-anwār*, and there also, under his leadership at the *khanigah* (dervish convent), his most notable student, Ṣadr al-Dīn al-Qūnawī (d. 673/1274) wrote works that were influential in spreading Ibn al-ʿArabī's doctrine. Learned sufis who fled from the Mongol invasion to Anatolia used to assemble in this *khanigah*, and as a result the influence of his doctrine spread to Iran and thence to India, and also to the Seljuk Turks. Through Qūnawī's students, the doctrine took root and extended to the Ottoman lands, where it continued for many years.[6]

During Ottoman times, the name of the first scholar to arrive from Andalusia, appears during the reign of Bayezid II. During the battles for Granada that began in 883/1478, the scholars of the city sent an envoy to Istanbul on behalf of the Andalusian Muslims to seek the help of the Ottoman State. The envoy presented a eulogy to Sultan Bayezid II written by the famous poet Abū'l-Baqā' Ṣāliḥ b. Sharīf al-Rundī. This poem known as the *al-Qaṣīda al-andalusiyya* (Endülüs Mersiyesi) eloquently expressed the oppression, hopelessness and torture that the Andalusian Muslims faced and their request for aid. Aḥmad al-Maqqārī[7] states that similar *qaṣīdas* and letters were sent to other Islamic lands and statesmen and opines that, among them, this poem by Abū'l-Baqā' al-Rundī was the most famous and beautiful.[8]

The Granada Sultanate, which was the last center of resistance for the Andalusian Muslims, fell in 1492. Thus, the emigration of Muslims and Jews began and scholars had to flee their country. Some of these scholars, who were protected by the Ottomans, came to Istanbul and Salonica, while others settled in North Africa. This allowed these scholars to make important contributions to Islamic and particularly to Ottoman science, and it is these contributions that need to be studied in more details. Until such a study is conducted the research presented in this article can help to shed some light on aspects of the subject. As shown below, some of the scholars protected by the Ottoman state became famous, with sultans appreciating and favoring them. The tradition of undertaking scholarly journeys, seen in the early periods of Islamic history, continued in the 9th/15th, 10th/16th and 1lth/17th centuries and spread over a vast geographical

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[6] Ahmed Ateş, "Ibn al-ʿArabī, Muḥyī'l-Dīn", *EI*, III, 707-711; Ahmed Ateş, "Muhyiddin Arabi", *İA*, VI/II, 533 ff.

[7] Abū'l-ʿAbbās A. al-Maqqārī, *Nafḥ al-ṭīb min ghusn al-Andalus al-raṭīb*, ed. Iḥsān ʿAbbās, Beirut 1968, IV, 479-495.

[8] *Ibid*, IV, 486-489.

area. The following examples have been gathered after an extensive survey of sources and manuscripts.

1. ʿAbd al-Salām al-Muhtadī (living in 918/1512) - *OALT,* no. 39, p. 71*; OTTBLT,* no. 18, p. 20*; OTIBLT,* no. 58, pp. 97-98.

ʿAbd al-Salām al-Muhtadī al-Muḥammadī, also known as Khodja Ilyā al-Yahūdī, was a scholar who lived during the reigns of Sultan Bayezid II and Sultan Selim I.[9] He knew the Torah by heart and had a vast knowledge of astronomy, calendar-making, arithmetic and geometry. It is assumed that Ilyās b. Ibrāhīm (Abram) al-Yahūdī, who travelled from Andalusia and settled in Istanbul during the reign of Bayezid II, and ʿAbd al-Salām al-Muhtadī are the same person. After converting to Islam and taking the name ʿAbd al-Salām al-Muhtadī, he wrote a refutation in Arabic addressed to the Jews, titled *al-Risāla al-Hādiya* and dated Saturday, 19 Jumādā II 902/ 22 February 1497.[10] The date of this work verifies that ʿAbd al-Salām was one of the Jewish emigrants who arrived from Spain in 1492. He entered the service of Sultan Bayezid II after already having embraced Islam.

ʿAbd al-Salām wrote works particularly in the fields of medicine and astronomy. In one of his medical works, titled *Mijannat al-ṭā'ūn wa'l-wabā'*, he describes the treatment that should be used against the plague.[11]

In the introduction to his work, ʿAbd al-Salām al-Muhtadī states that God gave him knowledge of the science of medicine by means of his travelling in famous countries and examining the reliable books of the old and new physicians. Among the books he examined are: *Kitāb Epidemia (Kitāb al-amrāḍ al-wāfida), Kitāb al-amrāḍ al-ḥādda* and *Kitāb taqdimat al-maʿrifa* by Hippocrates; *Kitāb aṣnāf al-ḥummayāt, Kitāb ṣināʿat al-kabīr* and *Kitāb al-aghdhiya* by Galen; *Kitāb al-ḥummayāt* by Iṣḥāq b. Ḥunayn; *al-Hāwī* by Abū Bakr Zakariyyā' al-Rāzī; *al-Rasā'il* by Marwān b. Zuhr; *al-Qānūn* by Ibn Sīnā and *al- Kulliyyāt* by Ibn Rushd. [In addition to the above, the author also quotes from the works of other physicians and scholars such as Isidore[12], Plato, Pythagoras, Angzy Gvry[13], Cenzv (Cydr)[14], Ptolemy and Musa].

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[9] Bursalı Tahir Bey, *Osmanlı Müellifleri*, İstanbul 1342, III, 214.

[10] Katib Çelebi, *Kashf al-Zunūn*, Ankara, Maarif Vekâleti, 1941,1943, II vols, I, 900, II, 2027; Brockelmann, *GAL*, Suppl., II, 990, no. 10.

[11] A copy of this work is located in Es'ad Efendi, no. 24833, fols. 28-53. See Ramazan Şeşen, Cemil Akpınar, Cevad izgi, *Catalogue of Islamic Medical Manuscripts in the Libraries of Turkey*, ed. Ekmeleddin Ihsanoğlu, Istanbul: IRCICA, 1984, 41.

[12] This scholar is known as İsidore from Seville. His work is one of the sources used by Konrad von Megenberg, a German scholar of the XIIIth century, for his *Das Buch der Natur*. This latter work

ʿAbd al-Salām reports that he thoroughly studied other widely read books written by Muslim authors, as well as works written by Jews and Christians. He examined the related passages in the light of his experience and sagacity, and he engaged in discussions and experiments with specialists in the *medreses*. In this way he learnt almost all of the medical sciences.

The author realized that several experiences were necessary for learning the essence of medicine. He exerted great efforts in treating illnesses and wished to write "a few folios" so that both the noble and common people could learn and benefit from his writings. He states that the plague was mentioned in almost all books of medicine, but due to dull, unclear and lengthy passages, they did not serve the purpose, and so he compiled a treatise titled *Mijannat al-Ṭāʿūn wa'l-Wabā'* and submitted it to Sultan Bayezid II.

This treatise consists of an introduction, four chapters and ten subjects. Chapter one defines and explains the reasons for the plague, which appears as a swelling on the body. Chapter two focuses on the symptoms of the illness. Chapter three mentions the preventive health measures which should be taken when the illness becomes apparent. Chapter four is about the medication used against the plague, which is accompanied by fever. The author states that his objective in writing this book is not to prove his superiority over other physicians or to demonstrate his skills in medicine. Instead, he claims he is doing it for the sake of God and in consideration of people's welfare and to reduce the suffering of those infected by the disease.

ʿAbd al-Salām identifies the great earthquake (14th September 1509) as the cause of the plague epidemics which spread in Istanbul, supporting this opinion with Aristotle's famous viewpoint: 'The earthquake is caused by the underground vapors that are pushed towards the surface of the earth'. ʿAbd al-Salām states that he was in touch with most of the medical experts engaged in combating this illness, who had applied the necessary preventive measures "over and over again" in their treatment. ʿAbd al-Salām does not claim his book to be a source of treatment for every patient, but states that, even if one patient in a thousand is saved because of his treatise, he will receive the grace of God.

The author gained considerable experience during his travels. He became aware of the novelties and discoveries in medicine which took place in Europe during this period. For example, he mentions some of the measures which were

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draws largely on *De natura rerum* by Thomas of Cantimpré. (Adıvar, p. 56).

[13] The name of this physician is spelled as انکزی غوری in the text. His identity, however, is not known.

[14] The name of this physician is spelled as جئزو in the text. His identity, however, is not known.

taken against the plague by experienced Christian physicians. In Naples, burning trees were found to be a great remedy against the illness. He also notes that in the region of Herbel[15] in Spain, they burned incense twice a day in order to get rid of the foul air. The author also mentions a salve used to combat the plague that was popular among European physicians, stating that he personally witnessed its benefits.

Another aspect of *Mijannat al-ṭāʿūn,* which deserves mention, is ʿAbd al-Salām's criticism of Ibn Sīnā's *al-Qānūn.* According to ʿAbd al-Salām, Ibn Sīnā gives detailed explanations of illnesses which occur very rarely and cause little harm, while only giving brief and insufficient information about infectious diseases which frequently break out, such as the plague. He does note, however, that skilled and capable European physicians come to Ibn Sīnā's defence on this issue. In their words: Ibn Sīnā is to be excused in this instance, because he naturally gave long explanations for the treatment of illnesses and the preventive measures with which he was experienced and familiar.

Sultan Bayezid II charged ʿAbd al-Salām al-Muhtadī with combating and treating the plague epidemics that occured in Istanbul, and the above work in Arabic was written on this occasion. The book was twice translated into Turkish. The first translation was made in 1209/1795 by Gevrek-zāde Ḥāfiẓ Ḥasan Efendi (d. 1216/1801), who also made some of his own additions.[16] Gevrek-zāde recounts the great earthquake that struck Istanbul during the reign of Sultan Bayezid II. The plague broke out after this catastrophe, and most of the physicians in Istanbul were unable to prevent or treat the disease. However, ʿAbd al-Salām's successful efforts at curing the majority of patients who caught the disease were much appreciated. He is said to have penned a treatise in Arabic about the subject. As most people did not know this language, Gevrek-zāde took it upon himself to translate *Mijannat al-Ṭāʿūn* into Turkish. He states that, while he was undertaking his translation, he examined the above treatise and compiled additional information on the subject, detailing the experiences of old and new physicians. He also added his own experiences and the new developments seen in the treatment of the disease. A translation of the author's introduction is also included in the book.

The second translation of *Mijannat al-ṭāʿūn* was made in 1311/1893-94, during the reign of Sultan ʿAbd al-Ḥamīd II. Sanayi Alayı Müftüsü (Muftī of the Industrial Regiment) Aḥmed-i ʿUmārī al-Shāmī translated the work under the title

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[15]This place is written as هربل in the text. However, there is no information about it.

[16] The only copy of this work is located in İ.Ü. Ktp, *TY*, no. 1299.

al-Tawfīqāt al-ḥamīdiyya fī daf' al-amrāḍ al-wabā'iyya.[17] In his introduction, Muftü Aḥmed Efendi states that, although cholera had almost disappeared from the Ottoman lands, it emerged again in Istanbul and in some other Ottoman provinces. Various health and medical institutions discussed the emergence and source of this dreadful disease as well as methods of treating it. He states that the Ottoman press referred to Western newspapers, which claimed that the existence of a great number of flies and insects in summer, as well as earthquakes, causes cholera to appear. The Western newspapers corroborated this viewpoint by reference to scientific studies. He adds that, although some regions were safe, in cities such as Malatya, cholera surfaced after continuous and severe earthquakes. The translator also states that information about cholera was not confined to works containing recent scientific research and medical studies. Indeed, in Islamic libraries, one would find many works on health and philosophy, as well as numerous books and treatises about medicine. He mentions that the earthquakes and insects that appear in the summer, such as flies, are among the causes of cholera. He also notes that the treatment of this disease is mentioned in the work titled *Mijannat al-ṭā'ūn wa'l-wabā'*, written by Jewish physician Ilyās al-Yahūdī, who arrived in Istanbul from Spain and submitted his work to Sultan Bayezid II, son of Meḥmed II. Ilyās wrote many useful works as well as a commentary on *al-Qānūn fī 'l-ṭibb* by the famous Muslim physician Ibn Sīnā. The translator notes that *Mijannat al-ṭā'ūn wa'l-wabā'* has been kept in Islamic libraries for centuries. He points out that the methods and the botanical and chemical substances used in the treatment of cholera, conform to contemporary medical knowledge. In this way he drew the attention of Ottoman physicians to this book.[18] The fact that this work was translated twice in the interval of a century, shows that the old medical literature was still held in favor.[19]

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[17] The only copy in the translator's handwriting is located in Cerrahpaşa Tıp Tarihi, no. 105.

[18] Cerrahpaşa Tıp Tarihi, no. 105, fols. 1b-3b.

[19] A similar example showing the demand for old medical literature is the fact that the work titled *al-Shifā' li-adwā' al-wabā'* by Taşköprülü-zāde (d. 968/1561) was also translated twice. It was first translated by 'Abd al-Ghanī Efendi in 988/1580 under the title of *Tarjamat al-Shifā' li-adwā' al-wabā'* (İ.Ü. Ktp., *TY*, no. 20372, fols. 16b-33a). Then, more than two and a half centuries later, Ahmed Tevhid Efendi (d. 1286/1870) translated Taşköprülü-zāde's work under the name *Bazl al-Mā'ūn fī Jawaz al-Hurucc'an al-Tā'ūn* (Cerrahpaşa, no. 225). This was at a time when the Ottomans started to use quarantine measures against contagious diseases and physicians such as Şâni-zāde Mehmed Ataullah (d. 1242/1826), Mustafa Behcet (d. 1248/1832) and Miralay Hüseyin Remzi (d. 1313/1895) translated works on medicine from the West. Indeed, the number of these translations increased in this period. However, the above example indicates that the old medical tradition still continued in this period.