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Mediaeval Islamic Inkmaking Recipes: Provenance, Dating, and Authorship in a Rare Egyptian Manuscript

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Abstract

This study investigates the provenance, dating and authorship of a previously unknown Egyptian manuscript that was erroneously catalogued in the Egyptian National Archives as *"Rsālh Fá Ṣnā'at al-'Hbār Wghyrhā"* (A treatise on the manufacture of inks and other matters). New insights into the technical and historical aspects of mediaeval and post-mediaeval ink production in Egypt are presented through a detailed textual analysis of the manuscript and two other surviving copies. The manuscript is rich in recipes for various types of inks - black, red, gold and others - as well as techniques for the treatment of metal and the production of adhesives. The study gives the manuscript the correct name *"Nabdha Latifa Fá Elm al-Ketaba Wa al-'Hbār"* (A brief treatise in the science of writing and inks), and its author is of Egyptian origin. The manuscript probably dates from the 13th to 15th century when compared with other manuscripts. This work is also characterised by a collective authorship that is not attributed to a single author. The study also provides valuable data for conservators, historians and researchers in the field of Islamic material culture.

Keywords

Inkmaking; Islamic manuscripts; Provenance; Dating; Authorship; Egypt.

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وصفات صناعة الأحبار الإسلامية في العصور الوسطى: الأصل والتأريخ والتأليف في مخطوط مصري نادر

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الملخص

يتناول هذا البحث دراسة الأصل والتأريخ والتأليف لمخطوط مصري غير معروف سابقًا تم تصنيفه بشكل خاطئ في دار الوثائق القومية المصرية تحت عنوان "رسالة في صناعة الأحبار وغيرها" (رسالة حول صناعة الأحبار وأمور أخرى). تقدم الدراسة رؤى جديدة في الجوانب التقنية والتاريخية لإنتاج الأحبار في مصر خلال العصور الوسطى وما بعد العصور الوسطى، وذلك من خلال تحليل نصي مفصل للمخطوط ونسختين أخريين محفوظتين. يتميز المخطوط بغناه بالوصفات الخاصة بأنواع مختلفة من الأحبار – السوداء، الحمراء، الذهبية وغيرها – بالإضافة إلى تقنيات معالجة المعادن وإنتاج المواد اللاصقة. وتمنح الدراسة المخطوط اسمه الصحيح "نبذة لطيفة في علم الكتابة والأحبار" وتؤكد أن مؤلفه من أصل مصري. وتشير المقارنة مع مخطوطات أخرى إلى أن تاريخ المخطوط يعود على الأرجح إلى الفترة بين القرن الثالث عشر والخامس عشر الميلادي. كما يُظهر هذا العمل خاصية التأليف الجماعي، حيث لا يُنسب إلى مؤلف واحد. ويقدم البحث بيانات قيمة للمحافظين والمؤرخين والباحثين في مجال الثقافة المادية الإسلامية.

الكلمات الدالة

صناعة الأحبار؛ المخطوطات الإسلامية؛ الأصل؛ التأريخ؛ التأليف؛ مصر.

Introduction

Ink, or referred to as *al-midad*, is one of the most important substances known to mankind and has served as a medium for recording and labelling information since ancient times. It is inextricably linked to the process of writing and is therefore indispensable, as the act of writing cannot be carried out without it[1].

The methods for producing ink and its colour variations have evolved considerably over the course of history. The first ink produced by the ancient Egyptians was a rudimentary mixture of coloured dyes and water or a mixture of soot (often from scraping kitchen pots) or charcoal mixed with water and gum[2]. This technique was later adopted by other civilisations. In ancient Greece and Rome, soot was often used together with a dark liquid excreted by certain marine organisms. Red ink was also made with cinnabar (mercury sulphide)[3].

Islamic scholars were well versed in ink and used Chinese ink both before and after the introduction of Islam. This ink was procured through imports from China. In the Arab world, ink was also made from ingredients such as gallnut and vitriol (iron sulphate) mixed with gum or soot residue. With the expansion of the Islamic empire, the Muslim population learnt a variety of craft practises and industrial techniques, including the production of ink. Initially, they adhered to conventional methods, but quickly developed these processes further. Not only did they refine the preparation and production techniques, but they also experimented with and used new, previously unknown substances for ink production[4].

Numerous Islamic texts deal specifically with the art of producing ink and dyes. One of the most important is *Zīnat al-Katabah* (The Ornament of the Scribes) by Abu Bakr Mohamed ibn Zakariya al-Razi (865-925 AD), which is considered the earliest manuscript on the production of ink and contains a wealth of recipes for black and invisible ink as well as techniques for removing ink from paper[5, 6,7].

Despite its brevity, the work entitled "*Kitab 'Umdat al-Kuttab wa 'Uddat Dhawi al-Albab*" (Staff of the Scribes and implements of the discerning), attributed to al-Muʿizz ibn Badis (1008–1062 AD), is the most detailed treatise on the discipline of manuscript composition. The anonymous author summarises the basic components of manuscript production[8]. These include the selection and refinement of high-quality pens matched to different scripts, the formulation of ink using different black and coloured varieties, the mixing of pigments, the application of gold in writing, the techniques for erasing text, the processes for the application and polishing gold and silver, the production and finishing of paper, the ageing of paper and the intricate art of bookbinding. This pioneering and unique manuscript had a profound influence on the literature on the craft of manuscript production, particularly on the composition of materials.

[1] Gacek, A. (2011). The Arabic manuscript tradition. Brill. P.101

[2] Christiansen, T. (2017). Manufacture of black ink in the ancient Mediterranean. The Bulletin of the American Society of Papyrologists, 167-195.

[3] Pearce, J. (2024). An empire of words? Archaeology and writing in the Roman world. Materialising the Roman Empire, 45.

[4] Sathiyamani, S., Tillier, M., Vanthieghem, N., & Colini, C. (2011). Leafing through time: Ink Analysis of the longest Qur'ān on Papyrus.

[5] al-Razi, M. (1502). *Zīnat al-Katabah* (The Ornament of the Scribes). Class-mark: Majāmīʿ Ṭalʿat 331. MS Dar al-Kutub (National Archive of Egypt). Cairo: 11.

[6] Zaki, M. (2011). Early Arabic bookmaking techniques as described by al-Rāzī in his recently rediscovered Zīnat al-Katabah. Journal of Islamic Manuscripts, 2(2), 223-234.

[7] al-Razi, M. (2011). *Zīnat al-Katabah* (The Ornament of the Scribes), Alam al-Makhtutat wal-Nawadir, edited by Lutfi Allah Qari, Volume 16, Issue 2, 2011.

[8] Ibn Badis, A. 1971. *Kitab 'Umdat al-Kuttab wa 'Uddat Dhawi al-Albab* (Staff of the scribes and implements of the discerning), an edited Arabic copy. Journal of Arabic Manuscripts Institute 17(1): 43–172.

The circulation of its copies in all major Islamic cultural centres testifies to its enduring importance[1].

Another notable work is "*Kattab Qutuf al-Azhar fi 'Amal al-Ahbar*" (The Book of Flowers in the Making of Inks), by Taqi al-Din bin Maimun al-Marrakushi, which he wrote in 1251 AD during his time in Baghdad at the Mustansiriya Madrasa, a mediaeval scholarly institute that provided a comprehensive framework for advanced learning[2], and in which he sets out the main methods for making ink. In this treatise, he attributes various recipes to important scholars and authors who had a great influence on the Islamic intellectual heritage[3]. In addition, "*Tuhfat al-Khawass fi Turaf al-Khawass: fi Sina'at al-Amdah wal-Sibagh wal-Adhan*" by Mohamed ibn Idris al-Qalalusi (1210-1307 AD), a well-known scholar and writer from Andalusia, also contributes to this discourse[4].

Numerous other texts dedicate sections to the topic of ink production, such as "*Ṣubḥ al-Aʿšā fi Ṣena't al-Inšā*" (The Dawn for the Blind in the Art of Writing) by al-Qalqashandi (1355–1418 AD), the famous Egyptian scribe of the fourteenth-fifteenth century during the Mamluk Empire (1250–1517 AD)[5], and "*Qaṭf al-azhār fī khaṣā'iṣ al-maʿādin wa-al-aḥjār wa-natā'ij al-maʿārif wa-al-asrār*" (Picking Flowers in the Properties of Minerals and Stones and the Results of Knowledge and Secrets)" by Ahmad ibn Awad al-Maghribi (d. 1568) , another scribe who lived in Egypt during the Ottoman period (1517–1914 AD)[6]. It is worth noting that the responsibility for producing ink often lay with the calligraphers and scribes. With the growing demand for manuscripts, which led to further industrialisation of the craft and the subsequent division of labour, various craftsmen produced ready-made inks and sold it in specialised shops to customers in the market [13,14].

In this research, the provenance, dating and authorship of a new and unknown Egyptian manuscript in the National Archive of Egypt, erroneously catalogued under the title "*Rsālh Fá Ṣnā'at al-'Hbār Wghyrhā*" (A treatise on the manufacture of inks and other matters), was discussed on the basis of textual analysis or historical documentation. This provides new technical and historical insights into ink production in mediaeval and post-mediaeval Egypt. In addition, the historical and cultural significance of this important scholarly manuscript and the results will inform conservation and preservation practises for manuscripts and help historians learn more about the preparation and techniques of historical ink production.

[1]Ibrahim, S. (2024 September 21). Two New Sources on Manuscript Production: On the Arts of Ink Composition. https://al-furqan.com/ar/

[2]Waardenburg, J. (1965). Some institutional aspects of Muslim higher education and their relation to Islam. Numen, 12(Fasc. 2), 96-138.

[3] al-Marrakushi, T. (2021). *Kitab Qutuf al-Azhar fi 'Amal al-Ahbar* (The Book of Flowers in the Making of Inks), edited and annotated by Abdulaziz al-Sawari, Rabat :Dar el-Amane

[4] al-Qalalusi, A. (2007). *Tuhfat al-Khawass fi Turaf al-Khawass: fi Sina'at al-Amdah wal-Sibagh wal-Adhan*, edited by Husam Ahmed Mukhtar, Bibliotheca Alexandrina.

[5] al-Qalqashandi, A. 1915. *Ṣubḥ al-Aʿšā fi Ṣena't al-Inšā* (The Dawn for the Blind in the Art of Writing). Cairo, Egypt, Dar Al-Kuttub El -Khedawia (Library Khedivial or Egyptian National Library and Archives), V. 6.

[6] al-Maghribi, A. (1990). *Qaṭf al-azhār fī khaṣā'iṣ al-maʿādin wa-al-aḥjār wa-natā'ij al-maʿārif wa-al-asrār* (Picking Flowers in the Properties of Minerals and Stones and the Results of Knowledge and Secrets). Edited by Berween Badri Twfeek, Baghdad: Sylslat Khazan Eltorath.

Historic sources

The sanctioned manuscripts that have undergone the verification process are analysed in this study based on three manuscript copies:

The original manuscript is preserved in the National Library of Egypt and is catalogued under the class-mark (14 Sin'nat Taymour Arabic) (14 *Ṣinā ʿah*). It comprises three folios (23 folios), including a cover page. Each folio comprises two pages, resulting in a total of 46 pages with 19 lines per folio. The text is written in a careful, predominantly vocalised *Naskh* script, which shows certain inconsistencies in the diacritical marks, while the vocalisation of certain lexemes is consistent. The headings are in red colour and the pages lack a numerical designation. The arrangement of the pages follows the catchword system at the end of the recto pages. The title page clearly states in *Naskh* script: "*This is a treatise on the making of ink and other things ... and God knows best."* The title page also contains a reference to the owner: "*In the possession of the humble servant of God, Mustafa al-Ṣaftī, may God forgive him... Amen.*" It seems that he copied it for personal use, as can be seen from the colophon. He finished the copy on Tuesday, (18/1/1268 AH - 11/11/1851 AD). This treatise is the last part of a compilation of several works, the original of which is preserved in the Egyptian National Library, although an investigation has not yet been carried out.

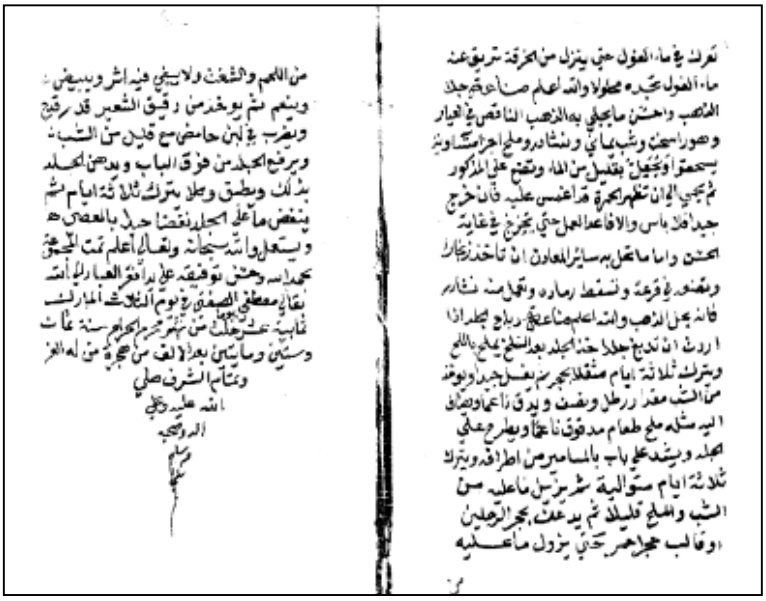

Figure 1 the last two pages of the original manuscript in the National Library of Egypt show the colophon.

The second copy is the Library of Congress version labelled (H-1117). It is based on the digital reproduction accessible through the website of the World Digital Library (IDL). It is an extract from a bound treatise that is part of a compilation of several works. It consists of 20 folios (40 pages) and is written in a contemporary, vocalised *Naskh* script, which, however, does not have a uniform vocalisation. Each page contains 19 lines. The headings are written in red ink and the catchword system is used. The seal of the Library of Congress can be seen on the back cover. There are no indications of ownership or marginal notes in the text. The owner of this copy is "*Muhammad ibn ʿĪsā al-Ṭanṭāwī*", who transcribed it for personal use, as noted in the colophon. He finished the transcription on Friday, (1/5/1268 AH - 23/1/1852 AD).

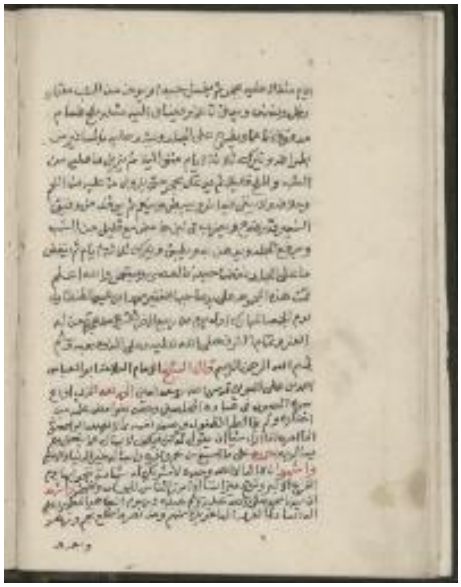

Figure 2 The page of the manuscript (H-1117) in the Library of Congress shows the colophon.

The third manuscript comes from the Al-Azhar Library in Cairo, where it is catalogued under the shelfmark (7665 ʻ(ayn)/261 kh). It is the second treatise in a collection consisting of four individual treatises totalling 20 folios (40 pages), which are arranged in this collection from folio 8 to folio 27. The text is rendered in a contemporary, carefully executed, vocalised *Naskh* script, characterised by the absence of uniform diacritical marks, with each page containing 21 lines. The title page is inscribed with the following statement: "This treatise was written by a scholar on the subject of writing and inks; may divine favour rest upon the author." The manuscript is decorated with the official seal of the Al-Azhar Library. It is written in black ink, while the headings are highlighted in red ink, and it contains the catchword system. The entirety of this compilation is transcribed in the manuscript by "*Mohamed ibn Wafā al-Shāfiʿī*", who completed the transcription on Monday, (6/4/1282 AH - 28/8/1865 AD), as noted in the colophon of the previous treatise. This manuscript agrees with the two previous copies, although there are certain differences in the diacritical marks.

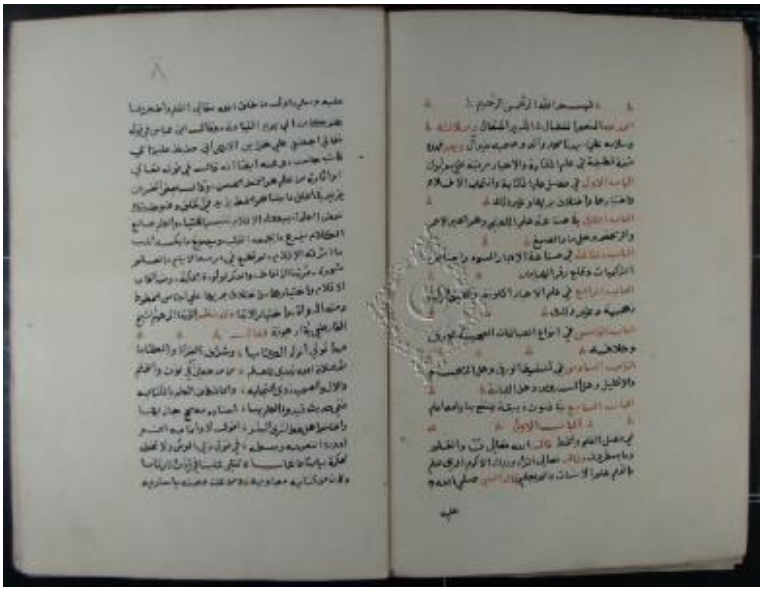

Figure 3 The first two pages of the third manuscript in the Al-Azhar Library in Cairo.

Evaluation of manuscript copies

A remarkable observation concerns the existence of three identical manuscripts of this treatise, written in 1851, 1852 and 1865 AD. They were all copied in the second half of the 19th century, which indicates an increased demand for this text at that time. This incident is quite astonishing and requires clarification and further scholarly research. Even the two manuscripts - from the National Archive of Egypt and the Library of Congress - are close to each other in terms of transcription date, about three months apart, and the calibre of the writing is also comparable in both cases. A textual comparison revealed that the differences between the two manuscripts are minimal and hardly worth mentioning, indicating that both were copied from an original.

There are several reasons for this phenomenon, including the recognition of the importance of this text alongside the recognition of its academic and professional merits, as well as the variety and originality of its subjects in terms of calligraphy and manuscript transcription, which seem to have been particularly vibrant at the time[1]. Alternatively, the increased demand could also be attributed to the growing interest of the educated elite in acquiring handwritten volumes, a trend that continued after the establishment of the Muhammad Ali dynasty in the early 19th century. This growing enthusiasm for manuscript heritage eventually culminated in the establishment of the Egyptian National Library (Khedivial Library) in 1870 AD[2].

Another factor could be the growing number of Orientalists who showed a great interest in the intellectual and cultural productions of the East, especially in the so-called "Oriental manuscripts". In essence, the growing demand for reproductions of the book could be closely linked to the general revival of the Orientalist movement[3].

Content of the text

The author has divided this scholarly treatise into eight different chapters, although he claims at the beginning that it comprises only seven chapters. This discrepancy arises from the author's decision to divide the content of the sixth chapter into two separate chapters: "Sixth and seventh chapter".

In the first chapter - described as the most concise within the treatise - he addresses the merits of knowledge and calligraphy by describing the optimal types of pens and the appropriate techniques for sharpening these pens to obtain high-quality pens that facilitates writing. In the following chapter, he explains the methods for making red ink. He gives six different recipes for making red ink, as well as two techniques for dissolving cinnabar and two other methods for making gum arabic, which can be used in conjunction with a variety of inks.

The third chapter is devoted to black ink, for which he presents ten different recipes with a range of ingredients, including soot, gall nuts and various metal compounds. At the beginning of this chapter, for example, he presents a comprehensive historical method for the production of high-quality oil-based ink, which includes the collection of soot, the preparation of ash water and the refinement of the ink with gum arabic and flour.

The fourth chapter is the most comprehensive and deals with the formulation of coloured inks and inks for gold gilding. The author provides recipes for seven types of coloured inks and seven different methods for making gold ink (also known as "gold gilding"), as well as a

[1] Ead, H. A. (2019). Globalization in higher education in Egypt in a historical context. Research in Globalization, 1, 100003.

[2] Abou-Khatwa, N. (2017). Calligraphers, Illuminators and Patrons: Mamluk Qur'ān Manuscripts from 1341–1412 AD in Light of the Collection of the National Library of Egypt. University of Toronto (Canada).

[3] Giese, F., Volait, M., & Braga, A. V. (Eds.). (2019). À l'orientale: Collecting, displaying and appropriating Islamic art and architecture in the 19th and early 20th centuries (Vol. 14). Brill.

method for dissolving arsenic, quick recipes for making other colours by incorporating gum Arabic, and a comprehensive guide to dissolving Verdigris to make green ink for tablets.

The fifth chapter is devoted to techniques for making and colouring paper in various shades, a topic rarely covered by other scholars in the field of writing materials and their manufacture[1]. The sixth chapter deals with the production of decorative materials obtained from gold and silver sheets and explains the preparation processes required for their use as ink. In the seventh chapter, the author focuses on the techniques used to produce adhesives and glues, culminating in a description of the process used to produce the "clay of wisdom". The eighth and final chapter includes a series of recipes for the chemical industry, including methods for softening metals and the formulation of substances (medicinal compounds) that improve iron rust and facilitate the casting of metals.

Discussion

The manuscript under examination is an exceptional academic and professional contribution to the subject. The author has deliberately called this work a "Concise Summary" because of its brevity and focus. It serves as a concise and practical reference work that is easy to understand and of great use. It contains much of the critical content of other scholarly texts on the art of writing and ink, but also differs in several specific dimensions.

The original manuscript of this new and unknown text in the National Archive of Egypt was erroneously catalogued under the title *"Rsālh Fá Ṣnā'at al-'Hbār Wghyrhā"* (A treatise on the manufacture of inks and other matters), but after examining this original manuscript and the two copies mentioned, the correct name is *"Nabdha Latifa Fá Elm al-Ketaba Wa al-'Hbār"* (A brief treatise in the science of writing and inks)[2]. I found this manuscript in 2003 while researching the production process of Islamic paper in the National Archive of Egypt, the second copy in 2009, while a master researcher came across the third copy in the Al-Azhar Library in Cairo in 2019[3]. The entire manuscript was edited and published in Arabic in 2021[4], but the text is still unknown to the scholarly English public. This edited Arabic text also contains some inaccurate information about the provenance, dating and authorship of the text, which was discussed in this article.

The introductory section in the text of the manuscript on the merit of authorship serves as a concise summary of the themes formulated in the preface to the volume *'Umda al-Kuttab*, attributed to al-Mu'izz ibn Badis. It appears that the author decided against a detailed elaboration of the introduction. Instead, he focuses on the pragmatic and applied dimensions required for a scribe or calligrapher in his professional activity, which were the primary impetus for writing or compiling this dissertation.

In addition, the manuscript contains a variety of ink formulations and recipes derived from the above-mentioned text, which can be traced back to the 11th century AD. It can be traced back to the 11th century AD. This chronological reference indicates that this text contains recipes

[1] Ebeid, H., J. Brown, Y. Holt, and B. Singer. 2013. A study of dyed endpapers during Islamic mediaeval times in Egypt: Purpose, materials and techniques.

[2] *Nabdha Latifa Fá Elm al-Ketaba Wa al-'Hbār* (A brief treatise in the science of writing and inks). 1851. Class-mark (14 Sin'nat Taymour Arabic), Microfilm No. 17837, Cairo, Egyptian National Library and Archives (Dar al-Kutub).

[3] Nabawy, D. (2024). *A Detection of the Authenticity of Carbon Ink used in historical manuscripts: An analytical and experimental study.* (Master's thesis), Ain Shams University, Cairo.

[4] *A Treatise on the Science of Writing and Inks by an unknown author from the Ottoman era*. (2021). Edited by Ahmed Abdel Hamid, Hassan Ebeid, and Yahya Al-Souda. Egyptian General Book Organization, Cultural Heritage Series (37).

from various other texts and means that it is a document that has undergone a process of development over time, with numerous additions or omissions depending on the prevailing culture of manuscript production. For example, the author presented two unique methods of dissolving cinnabar, this is the first, as follows:

> *"A half a pound of high-quality Roman cinnabar is taken and grinded thoroughly on a stone plate with a pestle* [to obtain] a *fine and precise grind. It is then collected in a container and immersed in vinegar, which is left to stand for three hours until it becomes clear. The vinegar is strained, then immersed in fresh water and left to stand for two hours. The water is strained, and this process is repeated three more times until it is free of yellowness and impurities. The gum is then dissolved in a sufficient quantity of water and the cinnabar is added. The whole thing is placed in a glass jar and hung in the sun for a whole week. Then it is taken out and can be used. And God is the guide for what is right."*

Thus, at the beginning of the third chapter, the author presents a comprehensive historical process to produce high-quality oil-based ink, which includes the collection of soot, the preparation of ash water and the refinement of the ink with gum arabic and flour as follows.

> *"Linseed Oil-based ink, the finest of all inks: Its recipe: about ten pounds of linseed oil of good quality is taken, more or less, and to be put it in a lamp with four wicks. [The lamp] is covered [page 6v] with a vessel-like oven with a hole in the top, and above it a second vessels with a hole, up to seven vessels like a chimney. Wicks are lighted and they are leaved until the oil is consumed. Then, the soot is collected that has risen into the vessels using a feather. Afterward, the needed an amount of ashes from Hejazi [a type] charcoal are taken, sifted through a fine sieve, and placed in a strong linen pouch. Twice as much water from a well is poured over it and it is boiled until it reduces by half. It is strained and the residue is discarded, letting the water sit to clear for a day and night. After filtering, some Arabic gum is dissolved in the previously mentioned ratio, with five ounces of water to one ounce of gum. The soot collected from the vessels is added and it is kneaded like dough. [Then] it is placed it in a stone mortar, and barley flour is added to it. A paste of ash water is boiled and applied to paper and [then] it is placed in the oven until it burns, and it is lifted, and fifty dirhams' worth are scraped off from it. If what is in the vessel is the size of an ounce, and it is added to what is in the vessel, and it is pounded until it has a smell like the smell of wine. Every time it dries, give it water in which the gum has been dissolved to drink, then increase the pounding until the smell disappears and a shine appears to it, and it is lifted [page 7r] and put into a wide copper vessel, and the water in which the ashes were boiled is poured over it. It is rubbed with the hand until it dissolves, and you add more water to it until you like its colour, and a large amount of ink comes out. [Then] it is stored in glass [containers], and it is used after a week, and God knows best."*

This recipe offers an important historical perspective on the synthesis of ink, but its complexity may make it less accessible to contemporary practitioners. With modifications aimed at improving clarity, ensuring safety, and increasing practicality, this recipe could serve as an exemplary reference for craftsmen and academics studying historical ink recipes.

Provenance

Although the three copies analysed have no clear provenance, the author of the treatise on the craft of writing and inks is of Egyptian origin. This conclusion can be drawn from several observations resulting from the textual analysis:

The linguistic structure of the text shows in numerous cases a close resemblance to the Egyptian-Arabic colloquial language. Moreover, the names of the plants mentioned, such as *Kurkum* (turmeric) and *Balīḥah* (weld), are ubiquitous in Egyptian spice markets, while other names are used in the Levant, Iraq and the Maghreb. Perhaps the most convincing evidence for the Egyptian origin of the manuscript is the author's use of "natron salt" to obtain a lemon-yellow colour of *Balīḥah* (weld). This particular substance comes exclusively from Egypt, more precisely from an area 35 kilometres north-east of Cairo known as Wadi al-Natrun[1], where this salt is found in its natural state and harvested for trade in the local markets. The author refers to it by its colloquial term (*al-aṭrūn*).

It can therefore be assumed that this manuscript is part of a broader compendium of Egyptian literature dealing with the intricacies of ink production in particular and book production in general. This corpus includes works such as *Ṣubḥ al-Aʿšā fi Ṣena't al-Inšā* (The dawn for the blind in the art of writing) by *al-Qalqashandī* (756–820 AH / 1356–1418 AD), who devoted a chapter in his encyclopaedic compilation to writing instruments, including inkwell, pen, ink and pigments[2]. Another important work is *Qaṭf al-azhār fī khaṣā'iṣ al-maʿādin wa-al-aḥjār* (Picking Flowers on the Properties of Minerals and Stones) by Ahmad ibn ʿAwaḍ al-Maghribī, who died in 976 AH / 1568 AD, which contains sections on the formulation of inks, pigments and dyes[3].

Dating

Knowing the time and date of composition of the manuscript helps to place the manuscript in a specific historical, cultural or social context. However, the original date of composition of this manuscript is not known, considering that the three copies referred to in this study date from the early second half of the 19th century AD. Some observations resulting from the comparative textual analysis of this manuscript and another dated manuscript could allow a relative dating and determine whether one manuscript is older or newer than the other, as follows.

This scientific treatise is characterised by a unique chapter, the fifth chapter, which deals with the different classifications of paper colouring, in which the author explains eleven recipes from fourteen plant and mineral sources. The speciality of this chapter lies not only in its thematic focus, but also in the meticulous quantification of the weights of the materials used in the production of paper dyes, as well as the specific quantity and type of water used in the extraction from natural sources[4]. It also describes the exact duration of soaking or boiling

[1] Shortland, A. (2004). "Evaporites of the Wadi Natrun: Seasonal and Variation and its Implication for Ancient Exploitation." Archaeometry 46(4): 497-516.

[2] al-Qalqashandi, A. 1915. *Ṣubḥ al-Aʿšā fi Ṣena't al-Inšā* (The dawn for the blind in the art of writing). Cairo, Egypt, Dar Al-Kuttub El -Khedawia (Library Khedivial or Egyptian National Library and Archives), V. 6.

[3] al-Maghribi, A. 1708. *Qaṭf al-azhār fī khaṣā'iṣ al-maʿādin wa-al-aḥjār wa-natā'ij al-maʿārif wa-al-asrār* (Picking flowers in the properties of minerals and stones and the results of knowledge and secrets). Manuscript No. 1318, Baghdad, al-Kaderia Public Library.

[4] Ebeid, H., J. Brown, Y. Holt, and B. Singer. 2013. A study of dyed endpapers during Islamic mediaeval times in Egypt: Purpose, materials and techniques. In Paper Conservation: Decisions & Compromises. ICOM-CC Graphic Document Working Group Interim Meeting, Austrian National Library, Vienna, 17–19 April 2013:

required for the extraction of dyes from each of these natural materials to achieve optimal results. Some of these recipes have been empirically tested in the laboratory. The results show that the standards are remarkably accurate[1].

This chapter can serve as an important indicator for approaching the chronological origin of the manuscript. The treatise on the art of writing and ink bears a remarkable resemblance to a Persian manuscript written (or transcribed) by a librarian from Mashhad in Persia, particularly regarding the flora and materials used for colour extraction, the meticulous measurements, the number of recipes and the materials and techniques used for paper finishing[2]. This manuscript is also an important source of knowledge about the methods of paper colouring and dyeing. It is identified as Simi Nisaburi or Jauhar-e-Simi, dated to 1433 AD / 836 AH and titled A Book on Paper, Colours, Inks and Pens. It offers invaluable insights into the materials and methods of paper colouring that were common in Persia in the 14th and 15th centuries. The text was first translated from the original Persian into French[3] and then translated into English[4].

After a comparative and analytical examination of the two manuscripts (the manuscript examined here and the Persian text), it seems plausible that the treatise on the art of writing and ink - or more precisely the section on the colouring and polishing of paper - could date from an earlier period than Jauhar-e-Simi, possibly from the 13th to the 15th century. During this historical interval, Egypt had made advances in papermaking, following the introduction of this form of papermaking at the beginning of the 10th century AD/4th century AH[5,6].

It is conceivable that the Persian manuscript represents either a translation or an adaptation of the Arabic text, or vice versa, as both Arabic and Persian were used for most scientific and literary endeavours in Persia during this period. Moreover, in the period before the establishment of the Safavid state (1501-1736 AD)[7], there was a significant translation movement from various languages, especially Arabic, into Persian[8]. A similar phenomenon occurred after the Ottoman Empire had developed into a huge imperial entity encompassing Arab territories such as Egypt, the Levant and Iraq. It is worth noting, albeit cursorily, that a separate study should be devoted to this topic. There was a remarkable transfer of Arabic texts related to the discipline of writing and book material into Persian and Turkish, particularly in the context of the rise of the Safavid state to prominence as a political power from the 16th century onwards. Thus, scholars from these two nations (Persia and Turkey) were able to draw

Extended Abstracts, eds. L. Watteeuw and C. Hofmann, 61–65. Wien: Österreichische Nationalbibliothek [for] ICOM-CC.

[1] Ebeid, H., F. Di Gianvincenzo, I. Kralj Cigić, and M. Strlič. 2023. An art technical study and examination of mediaeval Islamic paper colouring techniques. In Working Towards a Sustainable Past. ICOM-CC 20th Triennial Conference Preprints, Valencia, 18–22 September 2023, ed. J. Bridgland. Paris: International Council of Museums.

[2] Porter, Y. and S. Butani. 1994. Painters, paintings, and books: An essay on Indo-Persian technical literature, 12–19th centuries. New Delhi: Manohar.

[3] Porter, Y. (1985). "Un Traité de Simi Neyšâpuri (IX e/XV e s.), Artiste et Polygraphe." Studia Iranica 14(2): 179-198.

[4] Thackston, W. M. (1990). "Treatise on Calligraphic Arts: A Disquisition on Paper, Colors, Inks, and Pens by Simi of Nishapur." Intellectual Studies on Islam: Essays Written in Honor of Martin B. Dickson: 219-228.

[5] Bloom, J.M. 2001. Paper before print: The history and impact of paper in the Islamic world. London: Yale University Press.

[6] Ebeid, H. 2018. Types of Paper in 14th–15th Century Egypt: Standard Criteria and Classifications. Luxor Int J Archaeol Stud.1(1):1–13.

[7] Newman, A. (2006). Safavid Iran: Rebirth of a Persian Empire, Issue 5 of Library of Middle East History, Bloomsbury Academic.

[8] Encyclopaedia Iranica. (1986). ARABIC LANGUAGE: iv. Arabic literature in Iran, Vol. II, Fasc. 3, pp 237-243.

on Persian and Turkish manuscript sources that probably originated from earlier Arabic texts. In doing so, they often neglect the relevant Arabic sources written at least five or six centuries earlier, in the 8th and 9th centuries AD, which deal with analogous topics, such as al-Razi's *Zinat al-Kattāb* (The Adornment of the Scribes)[1]. However, this could be explained in the context of insufficient knowledge of the Arabic language and its sources, just as some Arabic-speaking scholars lack familiarity with Persian or Ottoman-Turkish sources.

Authorship

It is clear from the text that the author of this scholarly treatise was a craftsman who had acquired considerable skills in writing, manuscript reproduction and decorative embellishment. On the other hand, it is not clear whether the author of the work is a scribe, a calligrapher or merely a copyist, whether he is a single author or a collective of authors, or whether the text is merely a compilation of earlier works with the aim of producing a short, concentrated and practical document.

It is strongly suspected that the individual responsible for writing this treatise possessed the skills of a calligrapher or a group of calligraphers. In this way, he summarises his accumulated knowledge, practical experience and special skills in this prized craft, a discipline in which its practitioners took great pride, together with the esoteric knowledge they had perfected and which they were often reluctant to pass on to those outside their professional circle. This hypothesis is supported by several observations. For instance, the author's pronounced focus on formulations for coloured and gold inks, particularly in terms of their quantities - especially when juxtaposed with recipes for black inks - suggests that they are intended for writing on coloured substrates such as red and black paper. Furthermore, the author devotes an entire chapter (the second chapter) to the production of refined *laʿlī* ink (a hue of red ink) and places this discussion before the chapter on the production of black ink. This is a departure from the norm found in most treatises on ink manufacture, which tend to focus on black ink as this is the predominant medium used by scribes[23,24,2].

Such features are characteristic of calligraphers, who often display a fervent enthusiasm for the use of coloured inks on both coloured and uncoloured writing surfaces[3]. The author's meticulous preoccupation with the paper, reflected in the fact that he devotes a separate chapter to the colouring and polishing of the paper (as mentioned earlier), underlines a process that calligraphers observe meticulously, as it is crucial to the ultimate presentation of their artistic work and their deep appreciation for writing on coloured surfaces with equally vibrant inks.

This scholarly work is characterised by a collective authorship that is not attributed to a single author, as can be read on the title page of the Azhar manuscript (the third manuscript) in a statement (Figure 4) that reads: "This is a treatise of some scholars on the science of writing and ink"," suggesting that the document may not be the product of a single intellectual, but rather a compilation of insights or experiences of several authors who were knowledgeable in the disciplines described in the text and brought them together for the essential benefit of their audience.

[1] al-Razi, A. (1502). *Zīnat al-Katabah* (The Ornament of the Scribes). Class-mark: Majāmīʿ Ṭalʿat 331. MS Dar al-Kutub (National Archive of Egypt). Cairo: 11.
[2] Ibn Badis, A. 1971. *Kitab 'Umdat al-Kuttab wa 'Uddat Dhawi al-Albab* (Staff of the scribes and implements of the discerning), an edited Arabic copy. Journal of Arabic Manuscripts Institute 17(1): 43–172.
[3] Blair, S. S. (2020). Islamic calligraphy. Edinburgh University Press.

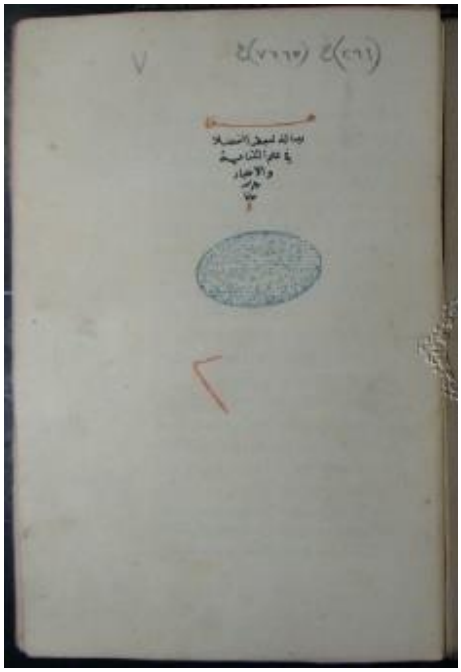

Figure 4 The title page of the third manuscript in the Al-Azhar Library in Cairo.

Conclusion

The study shows how important the manuscript is for understanding the craft of Islamic manuscript production and provides a comprehensive insight into the technological advances and practical knowledge that guided the scribes and calligraphers. The study not only provided valuable information about the materials, techniques and recipes of inks during medieval time in certain sources, but also made it possible to learn more about the origin, dating and authorship of this source. A comparative analysis with Persian texts points to possible historical links and an earlier dating than originally assumed. This study also emphasises the manuscript's unique ink recipes and its wider cultural significance in the Islamic world. The research highlights the importance of accurate cataloguing and the need for further investigation of lesser-known manuscripts to expand our knowledge of historical book production practises. Future work will focus on translating the entire text into English.

References

1. Gacek, A. (2011). The Arabic manuscript tradition. Brill. P.101
2. Christiansen, T. (2017). Manufacture of black ink in the ancient Mediterranean. The Bulletin of the American Society of Papyrologists, 167-195.
3. Pearce, J. (2024). An empire of words? Archaeology and writing in the Roman world. Materialising the Roman Empire, 45.
4. Sathiyamani, S., Tillier, M., Vanthieghem, N., & Colini, C. (2011). Leafing through time: Ink Analysis of the longest Qur'ān on Papyrus.
5. al-Razi, M. (1502). *Zīnat al-Katabah* (The Ornament of the Scribes). Class-mark: Majāmīʿ Taṭlʿat 331. MS Dar al-Kutub (National Archive of Egypt). Cairo: 11.
6. Zaki, M. (2011). Early Arabic bookmaking techniques as described by al-Rāzī in his recently rediscovered Zīnat al-Katabah. Journal of Islamic Manuscripts, 2(2), 223-234.
7. al-Razi, M. (2011). *Zīnat al-Katabah* (The Ornament of the Scribes), Alam al-Makhtutat wal-Nawadir, edited by Lutfi Allah Qari, Volume 16, Issue 2, 2011.

8. Ibn Badis, A. 1971. *Kitab 'Umdat al-Kuttab wa 'Uddat Dhawi al-Albab* (Staff of the scribes and implements of the discerning), an edited Arabic copy. Journal of Arabic Manuscripts Institute 17(1): 43–172.
9. Ibrahim, S. (2024 September 21). Two New Sources on Manuscript Production: On the Arts of Ink Composition. https://al-furqan.com/ar/
10. Waardenburg, J. (1965). Some institutional aspects of Muslim higher education and their relation to Islam. Numen, 12(Fasc. 2), 96-138.
11. al-Marrakushi, T. (2021). *Kitab Qutuf al-Azhar fi 'Amal al-Ahbar* (The Book of Flowers in the Making of Inks), edited and annotated by Abdulaziz al-Sawari, Rabat :Dar el-Amane
12. al-Qalalusi, A. (2007). *Tuhfat al-Khawass fi Turaf al-Khawass: fi Sina'at al-Amdah wal-Sibagh wal-Adhan*, edited by Husam Ahmed Mukhtar, Bibliotheca Alexandrina.
13. al-Qalqashandi, A. 1915. *Ṣubḥ al-Aʿšā fi Ṣena't al-Inšā* (The Dawn for the Blind in the Art of Writing). Cairo, Egypt, Dar Al-Kuttub El -Khedawia (Library Khedivial or Egyptian National Library and Archives), V. 6.
14. al-Maghribi, A. (1990). *Qatf al-azhār fī khaṣā'iṣ al-ma'ādin wa-al-aḥjār wa-natā'ij al-ma'ārif wa-al-asrār* (Picking Flowers in the Properties of Minerals and Stones and the Results of Knowledge and Secrets). Edited by Berween Badri Twfeek, Baghdad: Sylslat Khazan Eltorath.
15. Ead, H. A. (2019). Globalization in higher education in Egypt in a historical context. Research in Globalization, 1, 100003.
16. Abou-Khatwa, N. (2017). Calligraphers, Illuminators and Patrons: Mamluk Qur'ān Manuscripts from 1341–1412 AD in Light of the Collection of the National Library of Egypt. University of Toronto (Canada).
17. Giese, F., Volait, M., & Braga, A. V. (Eds.). (2019). À l'orientale: Collecting, displaying and appropriating Islamic art and architecture in the 19th and early 20th centuries (Vol. 14). Brill.
18. Ebeid, H., J. Brown, Y. Holt, and B. Singer. 2013. A study of dyed endpapers during Islamic mediaeval times in Egypt: Purpose, materials and techniques.
19. *Nabdha Latifa Fá Elm al-Ketaba Wa al-'Hbār* (A brief treatise in the science of writing and inks). 1851. Class-mark (14 Sin'nat Taymour Arabic), Microfilm No. 17837, Cairo, Egyptian National Library and Archives (Dar al-Kutub).
20. Nabawy, D. (2024). *A Detection of the Authenticity of Carbon Ink used in historical manuscripts: An analytical and experimental study.* (Master's thesis), Ain Shams University, Cairo.
21. *A Treatise on the Science of Writing and Inks by an unknown author from the Ottoman era*. (2021). Edited by Ahmed Abdel Hamid, Hassan Ebeid, and Yahya Al-Souda. Egyptian General Book Organization, Cultural Heritage Series (37).
22. Shortland, A. (2004). "Evaporites of the Wadi Natrun: Seasonal and Variation and its Implication for Ancient Exploitation." Archaeometry 46(4): 497-516.
23. al-Qalqashandi, A. 1915. *Ṣubḥ al-Aʿšā fi Ṣena't al-Inšā* (The dawn for the blind in the art of writing). Cairo, Egypt, Dar Al-Kuttub El -Khedawia (Library Khedivial or Egyptian National Library and Archives), V. 6.
24. al-Maghribi, A. 1708. *Qatf al-azhār fī khaṣā'iṣ al-ma'ādin wa-al-aḥjār wa-natā'ij al-ma'ārif wa-al-asrār* (Picking flowers in the properties of minerals and stones and the results of knowledge and secrets). Manuscript No. 1318, Baghdad, al-Kaderia Public Library.

25. Ebeid, H., J. Brown, Y. Holt, and B. Singer. 2013. A study of dyed endpapers during Islamic mediaeval times in Egypt: Purpose, materials and techniques. In Paper Conservation: Decisions & Compromises. ICOM-CC Graphic Document Working Group Interim Meeting, Austrian National Library, Vienna, 17–19 April 2013: Extended Abstracts, eds. L. Watteeuw and C. Hofmann, 61–65. Wien: Österreichische Nationalbibliothek [for] ICOM-CC.
26. Ebeid, H., F. Di Gianvincenzo, I. Kralj Cigić, and M. Strlič. 2023. An art technical study and examination of mediaeval Islamic paper colouring techniques. In Working Towards a Sustainable Past. ICOM-CC 20th Triennial Conference Preprints, Valencia, 18–22 September 2023, ed. J. Bridgland. Paris: International Council of Museums.
27. Porter, Y. and S. Butani. 1994. Painters, paintings, and books: An essay on Indo-Persian technical literature, 12–19th centuries. New Delhi: Manohar.
28. Porter, Y. (1985). "Un Traité de Simi Neyšâpuri (IX e/XV e s.), Artiste et Polygraphe." Studia Iranica 14(2): 179-198.
29. Thackston, W. M. (1990). "Treatise on Calligraphic Arts: A Disquisition on Paper, Colors, Inks, and Pens by Simi of Nishapur." Intellectual Studies on Islam: Essays Written in Honor of Martin B. Dickson: 219-228.
30. Bloom, J.M. 2001. Paper before print: The history and impact of paper in the Islamic world. London: Yale University Press.
31. Ebeid, H. 2018. Types of Paper in 14th–15th Century Egypt: Standard Criteria and Classifications. Luxor Int J Archaeol Stud.1(1):1–13.
32. Newman, A. (2006). Safavid Iran: Rebirth of a Persian Empire, Issue 5 of Library of Middle East History, Bloomsbury Academic.
33. Encyclopaedia Iranica. (1986). ARABIC LANGUAGE: iv. Arabic literature in Iran, Vol. II, Fasc. 3, pp 237-243.
34. al-Razi, A. (1502). *Zīnat al-Katabah* (The Ornament of the Scribes). Class-mark: Majāmīʿ Ṭalʿat 331. MS Dar al-Kutub (National Archive of Egypt). Cairo: 11.
35. Ibn Badis, A. 1971. *Kitab 'Umdat al-Kuttab wa 'Uddat Dhawi al-Albab* (Staff of the scribes and implements of the discerning), an edited Arabic copy. Journal of Arabic Manuscripts Institute 17(1): 43–172.
36. Blair, S. S. (2020). Islamic calligraphy. Edinburgh University Press.