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Off the Record – Networks of Lost Arabic Texts

Nadine Löhr

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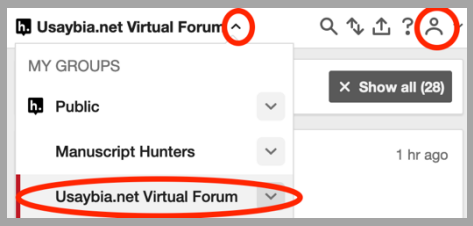

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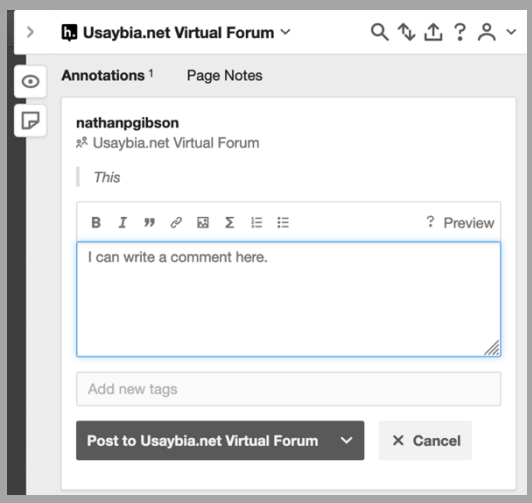

Off the Record – Networks of lost Arabic Texts

Nadine Löhr

Abstract

This paper contemplates lost literary works mentioned in Ibn Abi Usaybia's *History of Physicians* and suggests a method which may allow for a better understanding of the distribution and influence of lost or very rare texts (regarded as crucial parts of the history of Arabic literature). After an introduction of the parameters contributing to the loss of works and an explanation of digital tools employed, general trends observed in the interrupted transmission processes may be examined. Particular attention should be drawn to lost astronomical and astrological texts referred to in the historical bio-bibliography.

This draft documents the current state of research

Introduction

> *He was keenly interested in acquiring books and reading them. […] in Bulmuẓaffar's house there was a large sitting room with shelves that were laden with books, and […] Bulmuẓaffar spent most of his time in that room occupied with writing, reading and copying.*[1]

In 12th century Damascus, Bulmuẓaffar ibn Muʿarrif carefully copied, annotated, and collected many thousands of scientific texts, mostly on alchemy and philosophy. Today any information about him is sparse; the little we do know is owed to the diligent work by Ibn Abī Uṣaybiʿa who himself had seen many of the books which previously belonged to Bulmuẓaffar. If not for Ibn Abī Uṣaybiʿa we would probably not know about his library nor about a now lost astronomical treatise, he compiled.

Historians of Arabic literature know, it is necessary to change the perspective from the famous heroes of Arabic philosophy to those who collected and copied their works and thus contributed to their popularity. While studying such famous texts preserved in numerous copies and translations, we must also pay attention to those texts that have not reached such wide-spread renown. It is the intention of this paper to raise more awareness of such works and to suggest an approach which might allow us to better understand the dissemination and reception of apparently lost texts.

As Arnold Esch highlighted in his pioneering article, it is should be noted that there is a certain element of randomness of transmission (*Überlieferungs-Zufall*) which stands in contrast to likelyhood of transmission (*Überlieferungs-Chance*).[2] *Überlieferungs-Zufall* is unpredictable in that it can cause the disappearance of important literary works like Homer's *Margites* and the survival of a writing exercise which was never intended to be transmitted. However, likelyhood of transmission can be estimated depending on a number of different factors and they often work in conjunction with each other in effecting the disappearance of a text or its survival. In the following I briefly highlight some effects most relevant to the transmission of manuscripts produced in the Near and Middle East.[3]

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[1] See Parker's study 1988 on integrated pest management for libraries and archives.

[2] Esch, A., Übrelieferungs-chance und Überlieferungs-zufall als methodisches Problem des Historikers, *Historischer Zeitschrift,* 1985, 529-570.

[3] Research in this field has so far particularly been conducted by medievalists, some outstanding examples are: A short overview by Bourgain, P. & Light, L., Primer 4: Bestsellers, *Les Enluminures,* 2014, 36 pp.; Regazzoni, L. *(Ed.)*, Schriftlose Vergangenheiten Geschichtsschreibung an ihrer Grenze von der Frühen Neuzeit bis in die Gegenwart, *De Gruyter Oldenbourg,* 2019, 346 pp.; Kühne-Wespi Carina, O. K. P. & Quack, J. F. *(Eds.)*, Zerstörung von Geschriebenem Historische und transkulturelle Perspektiven, *De Gruyter,* 2019, 486 pp.; or in the field of European Studies: Grafton, A. & Blair, A. *(Eds.)*, The Transmission of Culture in Early Modern Europe, *Penn Press,* 1998, 336 pp. [*add references!*].

1) Material related causes: Paper is in general more susceptible to damage than parchment which can be washed and reused. Bindings treated with adhesives[4] ward off insects, especially the larvae of beetles – commonly referred to as "bookworms".[5] Similarly, paper of thicker and higher quality had a longer life cycle than books of lower quality, e.g., comprised of paper with splitting layers of pulp (démariage).[6] Slow fire and the corrosion of metallic-gall inks is unfortunately another common cause of the destruction of many manuscripts. Furthermore, the deterioration of the material is to a great extent result of climate and humidity, as well as destructions by fire and flood.

2) Circumstances of conservation and the efforts employed to preserve cultural heritage play of course a crucial role for the lifespan of a book. Of particular interest for cultural studies are old preserved collections like Genizah's or other depositories (Mosques or the famous Qubba of Damascus) which preserved documents and letters that otherwise would have had very little probability to be transmitted.[7]

3) Whether books are transmitted or not may depend on the use of a text and consequently its format: Beautifully illustrated manuscripts of the Quran, often commissioned or acquired at high costs, treated and stored with particular caution or even reverence are more likely to survive than books serving a practical purpose. Similarly, books of great size have a higher chance of survival than small pamphlets or booklets which were carried around more frequently. We remember the library of Muwaffaq al-Dīn ibn al-Muṭrān which comprised about ten thousand books, most of which he had copied in single volumes "on small-format paper, one-sixteenth the size of Baghdādī paper[8] [since] he would never leave his house without a book in his sleeve, which he would read at the gate of the Sultan's palace or wherever else he might go"[9]. Less wealthy readers kept unbound manuscripts or practiced the habit of loaning single quires to others[10] which caused the distortion of works.

4) Transmission may hinge on a reader's preferences or the value a certain culture attributes to particular books. If a culture keeps producing vast amounts of literary

[4] See (Gacek:2009) p.187, pastes to keep worms away were mostly produced with aloe, wormwood or colocynth.
[5] Add reference!
[6] Déroche on "spliiting" paper (San Lorenzo de El Escorial, June 2019).
[7] Further examples are the Dead Sea Scrolls found in the Qumran Caves [a slightly different case, but maybe include: or about 150 000 papyri preserved in the dry climate of Egypt currently studied and documented in the Arabic-Papyrology Database, cf. https://www.apd.gwi.uni-muenchen.de/apd/show_new.jsp]; for a thorough study on the damascene Qubba see the new publication Arianna D'Ottone Rambach, K. H. & Vollandt, R. *(Eds.)*, The Damascus Fragments: Towards a History of the Qubbat al-Khazna: Corpus of Manuscripts and Documents, *Ergon-Verlag,* 2020, 542 pp.
[8] We may thus imagine Muwaffaq al-Dīn's small size books not much bigger than 69×45 mm. According to (Gacek:2009) p. 192 Baghdādī paper designated a sheet of paper in the largest size (1099×733 mm), but the paper may also have had a particular high quality cf. See Bosch, Carswell & Petherbridge, *Islamic Bookmaking*, 30–31; Bloom, *Paper before Print*, 53–55.
[9] (Savage-SmithSwain:2020) chapter [15.23.4].
[10] *Add reference!*

works, which books are given preference when it is to be determined what to preserve? ʿAlī ibn Riḍwān advises to keep only a smaller amount of important books:

> I prefer to concentrate on the following: five books of belles-lettres (*adab*), ten books on Sharia, the books of Hippocrates and Galen on the art of medicine and related topics, such as Dioscorides' *The Book of Herbs*, the books of Rufus, Oribasius, Paul and al-Rāzī's *The Comprehensive Book*. Of books on agriculture and pharmacology there are four; of technical books (*kutub al-taʿālīm*), the *Almagest* and its introduction and whatever else is useful, as well as 'The Four Books' of Ptolemy. Of books by sages (*kutub al-ʿārifīn*), there are books by Plato, Aristotle, Alexander, Themistius, and Muḥammad al-Fārābī, and whatever else may be of use.
>
> Other books I either sell at any price I can get or I store in cases; however, selling them is better than storing them.[11]

We see, there is particular interest in keeping books of famous Greek scholars, but ʿAlī ibn Riḍwān decides not only to keep books featuring the translations of important Greek texts but also other useful literature for their study, such as an introduction to Ptolemy's Almagest, which leads us to another factor influencing a works survival:

5) Everything spawning additional works has a higher chance of survival.[12] We can almost certainly say that classical astronomical literature was rather studied through commentaries guiding a reader's interpretation than through the original works. Some outstanding examples are Naṣīr ad-Dīn aṭ-Ṭūsī's commentary on the Almagest, ʿAlī ibn Riḍwān's commentary on the Tetrabiblos or Abū Jaʿfar's (i.e. Ibn al-Dāya's) commentary on the Pseudo-Ptolemaic Centiloquium. The numbers of these commentaries are overwhelming in comparison to the texts on which they are based. But even though the texts were primarily studied in form of commentaries there was a strong interest in preserving the basic texts which even compelled scribes to recreate the original works. Thus, the copyist al-Bughāyrī from Harand in Khorasan explaines that he extracted Ptolemy's quotes from a commentary when he made a copy of the Tetrabiblos[13] and Emanuele Rovati obverses that the extant Arabic witnesses of the Centiloquium were (almost exclusively) created through the extraction of literal quotes from its commentary.[14]

6) This further demonstrates that agents witnessing the loss of manuscripts often interfered with an imminent decline of a manuscript tradition they considered indispensable. In some cases it may even have sparked renewed interest in a particular genre. When, for example "Al-Manṣūr decided that no book of logic and philosophy should remain in his lands, and many were burnt."[15] the teacher al-Ḥafīd Abū Bakr smuggled a book of logic and read it with his students.[16]

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[11] (Savage-SmithSwain:2020) chapter [14.25.2].

[12] See also (Esch:1985) p. 541.

[13] Nadine Löhr, *'MS Tehran, Kitābkhāna-yi Millī-yi Īrān, Ar 747'* (update: 08.11.2020), *Ptolemaeus Arabus et Latinus. Manuscripts*, URL = http://ptolemaeus.badw.de/ms/943.

[14] Ongoing research, Emanuele Rovati, *'Pseudo-Ptolemy, Kitāb al-Thamara'* (update: 23.06.2020), *Ptolemaeus Arabus et Latinus. Works*, URL = http://ptolemaeus.badw.de/ms/190.

[15] (Savage-SmithSwain:2020) chapter [13.63.5].

[16] (Savage-SmithSwain:2020) chapter [13.63.6].

7) Nevertheless, the destruction of cultural heritage caused through wars, political upheavals and changes of agenda, deterioration and theft are a major factor that contributed to the loss of literature.

In contemplation of such numerous effects contributing to the loss or survival of Arabic books, we remember Arnold Esch who asks: "What, then, is a historian to do?"[17] - He considers what is not known, evaluating the extant in contrast to the disappeared and searching for means to better understand the lost work.

A short note regarding the term - lost work

Whenever this article mentions lost works or books, I am not necessarily claiming that no such texts exist anymore, but that we are currently unaware of any surviving copies. Thanks to many research projects addressing manuscript and catalogue studies, hitherto unknown or lost treatises are found in private libraries as incorrectly titled codices or as overlooked parts of multiple-text-manuscripts. Further, pieces of texts (in particular commentaries) reappear when attention is paid to marginal and interlinear annotations, inserted leaves or palimpsests. In any case a work, which presumably failed to be transmitted, is either really lost or very rare and is worth our attention either way.

The Lost Manuscripts Project, Kent UK[18] is an outstanding example of a research project dedicated to the search for and study of lost texts. It compiles a catalogue of manuscript fragments of which most appeared recycled in later book covers or bindings. The project introduced a new term for the conceptualisation of lost manuscripts with a traceable existence: *manuscripts of Babel*. This term is referring to manuscripts existing "in a virtual space, in a no-place" (similarly as the term *Utopia* may be applied to manuscripts in anonymous private possession).

I decided against the use of the term *manuscripts of Babel* in this paper for two main reasons. First, "Babel" as a place of historical, religious or fictional longing may promote unnecessary romanticisation and mystification where our goal should be shedding light on lost works in order to understand their dissemination and reception. Second, in my opinion the metaphor doesn't work very well. Such fragments and pieces of information may be understood as the remains of a destroyed Tower of Babel, but the project also points out that the term references to Luis Borges literary masterpiece "La Bibliotheca de Babel".[19] The novel demonstrates the idea of a library in which everything exists (and at the same time very little makes sense), Borges' books feature everything that was written and that will ever be written. Though the amount of lost Arabic books is not endless and with sufficient research it is possible to get at least a rough impression of what was written where and when.

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[17] (Esch:1985) p. 569.

[18] 2015-16 and 2018-19, Dr. David Rundle, University of Kent UK, Center for Medieval and Early Modern Studies.

[19] A tale of a universe in a never-ending library comprised of books that contain every possible combination of letters. In 2012 Jonathan Basile wrote based on the novel's idea a computer algorithm for the creation of a digital Library of babel containing all possible pages of 3200 characters, about 10^{4677} books. [libraryofbabel.info].

Reasons to study the networks of lost texts

We may acquire deeper understanding of *Überlieferungs-Chance* if we distinguish between two scenarios: First, a collection as transmitted in a largely closed environment like a Genizah or Qubba and, in a slightly broader sense, monasteries where (almost) all texts that are added to the collection are preserved in this collection - until such repositories are emptied and refilled, discovered or destroyed.[20] The second scenario comprises texts that circulate in communities where life cycles of manuscripts end and the texts are transferred on new codices (or not). This scenario is reflected in networks that did not stop to revolve around the texts; networks comprised of readers, owners, scribes and so on. We pay particular attention to this second scenario. The introduction mentions effects that influence the survival or disappearance of the works in this network, but we can also claim that there is one factor that probably plays the most important part when it comes to the survival of a text: Its dissemination at a relatively early stage.
Whenever the dissemination of a text can be traced in several communities in different cultures and regions, it is far less likely that single factor such as an outbreak of fire in a library, war in one region etc., will cause the disappearance of a work. Especially the works of authors (mostly byzantine authors) who wanted their books to be destroyed directly after their death had naturally very little chance of transmission. It could be argued: The better disseminated a text, the longer may its lifespan be (or have been) and the more likely we are to find its traces in other sources, i.e. sources that were produced around the time of the circulation of the text in question.

This is where networks become a crucial tool. While we know relatively little about lost texts, we still have many valuable resources at hand that allow us to reconstruct where and by whom a text was read (or who claims to not have read a certain text). Collecting information on books in fact comes down to a collection of information on provenience: on libraries, readers, copyists and owners. Such a reconstructed network around any literary work will never be complete but it may assist a researcher in gaining an insight into the minimum circulation of a text, before its disappearance.

We may briefly introduce one example that illustrates the importance of transmission networks: Ibn Abī Uṣaybiʿa mentions 102 works compiled by ʿAlī ibn Riḍwān, of which he read 8 medical treatises,[21] overall there are according to the current state of

[20] We have to note that the Jewish Genizah practise of "storing away" is not identical to Islamic practises where we find indications for a later use of the texts. Still most texts stored in the Qubba and the monasteries were not much circulated after their deposition. See also the Introduction of the new publication Arianna D'Ottone Rambach, K. H. & Vollandt, R. *(Eds.)*, The Damascus Fragments: Towards a History of the Qubbat al-Khazna: Corpus of Manuscripts and Documents, *Ergon-Verlag,* 2020, 542 pp.

[21] The mentioned works are: autobiography – 14.25.1–14.25.2 (a.q.), *Fawāʾid* – 4.1.9.1 (u.p. in several instances), *K. Ḥall shukūk al-Rāzī ʿalā Jālīnūs* (*Resolution al-Rāzī's Doubts regarding Galen*) – 11.8.4 (a.q.), *al-Kitāb al-nāfiʿ fī kayfīyyat taʿlīm ṣināʿat al-ṭibb* (*Useful Book on How to Study the Art of Medicine*) – 6.3.1–6.3.4 (a.q.), *Tafsīr K. al-Firaq li-Jālīnus* (*Commentary of Galen's On Sects*) – 1.7 (a.q.), *al-Taṭarruq ilā l-saʿādah bi-l-ṭibb* (*Attaining Happiness Through Medicine*) – 4.1.9.2 (u.p.; list of books seems to be largely based on Ibn Riḍwān), sayings from unidentified work – 14.25.7–14.25.8 (a.q.), unidentified work – 4.1.2 (a.p.). Ignacio Sánchez, Chapter 5 Written Sources and

research not much more than 23 works surviving. One of the today extant treatises is ʿAlī ibn Riḍwān's commentary on the Tetrabiblos widely outranking the others with about 100 manuscripts in Arabic, Latin, Persian, Ottoman and Judeo Arabic, but it does not seem to have been particularly popular in the 13th century. Ibn al-Qiftī thinks "he does himself not contribute anything of importance"[22] and Ibn Abī Uṣaybiʿa, although relying on Ibn al-Qiftī as a major source, does not even mention it in his otherwise very reliable list of medical, astrological and philosophical texts. We may also point out Ibn Abī Uṣaybiʿa's meticulous research conducted for the compilation of these lists,[23] but apparently he did not encounter the later famous astrological work. The earliest extant copies produced in the Middle East are dated at around the beginning of the 16 century. Though by the 13th century the commentary had already reached al-Andalus where it was translated via a Spanish intermediary into Latin[24], owned and studied in the Jewish Sephardic communities and at least from 14th century onwards cited in astrological treatises in Morocco. The text may (on first sight) not have been popular in 12th-13th century Egypt and Syria but its dissemination in other regions possibly secured its transmission.

For single instances it is possible to collect and evaluate such information manually, but in combination to that I suggest digital prosopography as a tool for a better and more detailed understanding of lost manuscript traditions.

Possibilities and Limitations

Historical works, especially (auto-)biographies and bibliographical works are not extant in numbers that rival the copies of works on theology.[25] Consequently, Arabic literature is in most instances observed through the lenses of few famous historical biographers like Ibn al-Nadīm, Ibn al-Qiftī, Ibn Abī Uṣaybiʿa or Bar-Hebraeus. When addressing now apparently lost titles mentioned within these works, we are talking about already famous works, texts and author's well known enough so that they found their way into one or the other historical bio-bibliographical work. These are titles and

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the Art of Compilation in Ibn Abī Uṣaybiʿah's ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ, Appendix in: (Savage-SmithSwain:2020).

[22] (SchachtMeyrhof:1937) p. 33, in translation; (Lippert:1903) p. 443-4.

[23] Ignacio Sánchez surveys the immaculate amount of sources and efforts, Chapter 5 Written Sources and the Art of Compilation in Ibn Abī Uṣaybiʿah's ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ, Appendix in: (Savage-SmithSwainEtAl:2020).

[24] by Aegidius de Tebaldis at the court of King Alfonso X, see also David Juste, *'Ptolemy, Quadripartitum (tr. Aegidius de Tebaldis)'* (update: 13.05.2020), *Ptolemaeus Arabus et Latinus. Works*, URL = http://ptolemaeus.badw.de/ms/47.

[25] Pascale p.9 ; Ibn Abī Uṣaybiʿa quotes the autobiographies of Hunayn Ibn Ishaq, Ibn Haytham, ʿAlī ibn Riḍwān (lost) and ʿAbd al-Laṭīf al-Baghdādī (lost) as also highlighted by Ignacio Sánchez, Chapter 5 Written Sources and the Art of Compilation in Ibn Abī Uṣaybiʿah's ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ, Appendix in: (Savage-SmithSwainEtAl:2020).

figures that were supposed to be remembered and are based on the compiler's preferences and we know that possibly thousands of others never made it into such a compilation. But for all that bibliographical works can provide a basic understanding of the well-known books lost in the following centuries. Ibn Abī Uṣaybiʿa was only interested in physicians and gathered far more bibliographical data on most authors than was possible for Ibn al-Nadīm or Ibn al-Qiftī.
In that manner Ibn Abī Uṣaybiʿa's detailed and multifaceted biographies provide a unique insight into the social networks that evolved around famous scholars. In his history of medicine, he summarizes interactions of more than 450 physicians along with their social environment and almost 4000 work titles. He mentions scribes and collectors of books, scholars who study together or who refuting each other's works. In short: information most relevant to the history of Arabic literature.

[…]

Apart from bio-bibliographical references, information on the dissemination of a work should be gathered in catalogues, historical library and book lists or from works associated with the same literary genre which may contain references to the title in question. No prosopography[26] can capture every piece of data from every source, but the more sources we can contribute to a dataset the more detailed a picture of a lost manuscript tradition.

Digital Prosopography and Texts – how to shed light on presumably lost works

The basic use of historical bio-bibliographical works was so far limited to finding a person's biography, and to citing additional information on a scholar's life and works. New online editions, in particular "A Literary History of Medicine" (eds. E. Savage-Smith, S. Swain, G.J. van Gelder), offer wider application.
Communities of Knowledge applies further encoding processes and linking of entities (such as places, names, professions and events) which allows for an observation of individual scholars from different perspectives within the framework of a historical reference work. A user may then be able to visualize and study individual networks of a specific target group, based on desired parameters.
This requires a shift from the narrative descriptions of a bio-bibliographical collection to structured machine-readable data. I will roughly describe the process which will later allow us to evaluate the dissemination of a literary work: The team of Communities of Knowledge encodes the source text in TEI format producing a dataset which constitutes the basis for network visualization and analyses. All necessary

[26] And in this context we are talking about prosopography's including a focus on text transmission.

entities (names, works, places) are tagged in this process and receive stable URIs as identifiers. Additionally, so called factoids with a specific focus on relations between individuals (and in this case also between individuals and works) receive stable URIs.

In a factoid based approach it is possible to encode a researcher's interpretation of a primary source. Here I benefit from standards established by Daniel Schwartz, *Texas* A&M University – History Department[27] and Nathan Gibson, LMU Munich –in their upcoming article.[28]

The term factoid was applied by a group of researchers at King's Collage[29] who pioneered prosopography in a relational database. "Factoids capture assertions made in primary source texts and not necessarily confirmed truths about the past. The factoid approach to prosopography thus captures the scholar's interpretation of what a historical source asserts about persons."[30] In this manner it is possible to encode more complex pieces of information which the researcher may put into a relational database creating a nexus of relationships between the pieces. In general, we encode three kinds of factoids:

- Person factoids can contain an encoding of a variety of information related to an individual like ethnicity, education, gender or birth dates when an interpretation by the researcher is desired. This may for example apply for the instance in which ʿAlī ibn Riḍwān's date of birth (or a possible timespan) can only be retrieved from the planetary constellation given for the time of his birth. [element <person>]
- Event factoids capture relevant events in the source text which may later be obverted in a timeline or in contrast to other events. [element <event>]
- Relationship factoids can encode many kinds of relations between people (and in our approach between people and works). [element <relation>]

While early approaches of digital prosopography focused on a relational database for modeling prosopographical factoids, "Communities of Knowledge" (related to Syriac Persons, Events, and Relations-SPEAR) uses the TEI model for prosopographical factoids. To give a practical example, our source text states:

> Ibn Buṭlān was a contemporary of the Egyptian physician ʿAlī ibn Riḍwān, and the two of them exchanged extraordinary letters and shocking and astonishing writings. Neither of them would compose a book nor form any opinion without the other responding to it and exposing the folly of his opinion.[31]

[27] Schwartz, D. L.; Gibson, N. P. & Torabi, K. Modeling a Born-Digital Factoid Prosopography using the TEI and Linked Data *[submitted, in review],* 2021.
[28] A Linked Open Data (LOD) project that places this use of the TEI at the center of its research agenda.
[29] , Center for computing in the Humanities, now Department of Digital Humanities.
[30] Schwartz, D. L.; Gibson, N. P. & Torabi, K. Modeling a Born-Digital Factoid Prosopography using the TEI and Linked Data *[submitted, in review],* 2021.
[31] (Savage-SmithSwain:2020) chapter [10.38.2].

If we wish to trace the dynamics of a social networks and want to encode that the two scholars were refuting each other's works, we might use a @mutual relationship factoid with the @ref attribute "refuter-of" which points to the taxonomy defined in collaboration with Syriaca.org. The fully encoded factoid according to our standards is:

```
<div
   type="factoid" subtype="relation"
   xml:id="factoid-20"
   resp="#nloehr">
   <idno type="URI">https://usaybia.net/factoid/10-38-20</idno>
   <listRelation>
       <relation ref="usaybia:refuter-of" mutual="https://usaybia.net/person/961 https://usaybia.net/person/1093">
           <desc>Neither of them would compose a book nor form any opinion without the other
               responding to it and exposing the folly of his opinion</desc>
      </relation>
   </listRelation>
   <bibl type="urn">
      <ptr target="urn:cts:arabicLit:0668IbnAbiUsaibia.Tabaqatalatibba.lhom-ed-ara1:10.38"/>
      <citedRange unit="part">5</citedRange>
   </bibl>
</div>
<div
```

Taxonomy and the encoding of factoids should be limited to an amount most relevant and useful as possible. When the focus is shifted from individual scholars of a network to texts and manuscripts produced within this network we can trace the minimum circulation of well-known works as well as lost books with respect to temporal, regional or culturally shaped viewpoints and carefully estimate which closely collaborating scholars might have been aware of a certain works. Factoid based encodings can (depending on the time invested) only be conducted for a limited part of the source text, but will always profit from a visualization within the basis dataset retrieved from tags applied throut the complete source text. If desired the networks can easily be extended with the addition of encoded factoids from other sources such as further bio-bibliographical works like Ibn al-Nadīm or Ibn al-Qiftī.

We may also use encoded bibliographical reference works for a statistical analysis. One could ask: how many works are mentioned from a certain region at a certain time? Thanks to diligent research on part of the editors of Ibn Abī Uṣaybiʿa's new *History* who referred to secondary literature, anytime it was within their possibilities to find editions, translations and studies, as well as in cases in which it was possible to confirm that a text is lost, this information can be extracted through XQueries. If however, we seek to understand what a representative amount of texts for a certain region lost after 13th century is (again: only through the lenses of Ibn Abī Uṣaybiʿa's "History of Bestsellers"), it is necessary to conduct additional research in catalogues and databases for those instances in which no references are mentioned.[32]

[32] In future the Bibliotheca Arabica *Digital* (SAW) comprising numerous important catalogues for Arabic manuscripts studies will provide an ideal tool for such an undertaking: https://www.saw-leipzig.de/de/projekte/bibliotheca-arabica/intro.

Results and Discussion

1. General trends
2. Lost Works on the astral sciences some case studies
3. A list of lost works on the astral Sciences

Individuals and individual objects

[Conclusion …]

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