

Arab Islamic historical documents as a climatological source in the Maghreb

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Arab historiographical studies can provide detailed climatic data and information on natural disasters through the exploitation of academically revised and re-edited ancient manuscripts. Maghrebian scholars have written valuable chronicles and annals that can form the basis of relevant paleoclimatic series.

Documentary data from all over the world can contribute to our understanding of the climate of the past. Such data are found in the archives of societies, and it is the aim of historical climatologists to give these documents voice and credibility. Progress in codicology and paleography has made it possible to examine old manuscripts more efficiently (Mathisen 2008). In particular, critical source editions and transcription projects have made these handwritten texts accessible to researchers from disciplines outside of the historical sciences. Apart from this indisputable progress, however, uncountable manuscripts still remain unexplored in archives and libraries around the world (Zaydān 1997). The

first attempts to make such manuscripts accessible to a broader audience were made by Benedictine Monks in the 17th century. Frenchman Bernard de Montfaucon (1655–1741), author of *Bibliotheca bibliothecarum manuscriptorum nova*, is considered one of the founders of this field.

Arabic historiography

The manuscripts discussed here are examples of a long and noble tradition of historiographical writing by the Arab people that mostly characterizes urban life (e.g. Ibn Khaldun 1378). They are also a mirror of the golden era of literature in the Arabic world that spanned nearly a century, starting from 753 CE (al-Jābirī 2009). The study of such

manuscripts is only one of the approaches for analyzing the cultural transformations of past Arab societies, but alone, this is not sufficient; it is also crucial to place Arab historiography in its physical, historical, and geographical context, as was done by al-Munajjid (1960), Pedersen (1984), Sayyid (1997), Sāmarrā'ī (2001), Binebine (2004), Gacek (2009), and others. The editing process of Arabic manuscripts entails the collection of as many available copies of a specific manuscript as possible in order to compare and re-edit them in an orderly manner using legible and clear writing. Moreover, indexations and further contextualization of works within the fields of codicology and paleography are a part of the editing process. The final product can be read by non-specialists in Arabic literature, such as paleoclimatologists who aim to identify the relevant climatic information. Despite the various efforts made, however, the field of Arab manuscript research is still in a rather embryonic state with hundreds of thousands, if not several millions, of manuscripts to explore.

Weather descriptions in Arabic historiography

Arabic historiography, which is primarily a narration of human actions, might be subject to personal, political, religious, and/or otherwise biased interpretations, but this usually does not interfere with the descriptions of weather and natural conditions. Regarding weather conditions, accurate recording of heavy rains, extreme cold, or solar eclipses are available in Arabic historiographic texts. These are examples of the types of observations that are most likely to be of use in reconstructing paleoclimatic timeseries. Moreover, extreme natural events and sudden disasters, famines, and epidemics are also mentioned in the manuscripts, due to their severe impact on human societies.

Examples of weather descriptions

One of the pioneers of general concepts of geography in the Maghreb region was al-Idrīsī (d. 1165), born in Ceuta, which was then subordinate to the Almoravid State in Morocco. He was a scientist, writer, geographer, and cartographer who lived in Palermo, Sicily, in the kingdom of Roger II. Apart from his geographical and cartological work, al-Idrīsī is best known for his *Nuzhat al-mushṭāq fi ikhtirāq al-āfāq* (نزهة المشتاق في اختراق الآفاق), or in Latin *Tabula Rogeriana*, which translates into "the map of Roger" – a book that is organized into seven climate zones of the Earth. He analyzed the succession of seasons and meteorological conditions according to the latitude and longitude. In

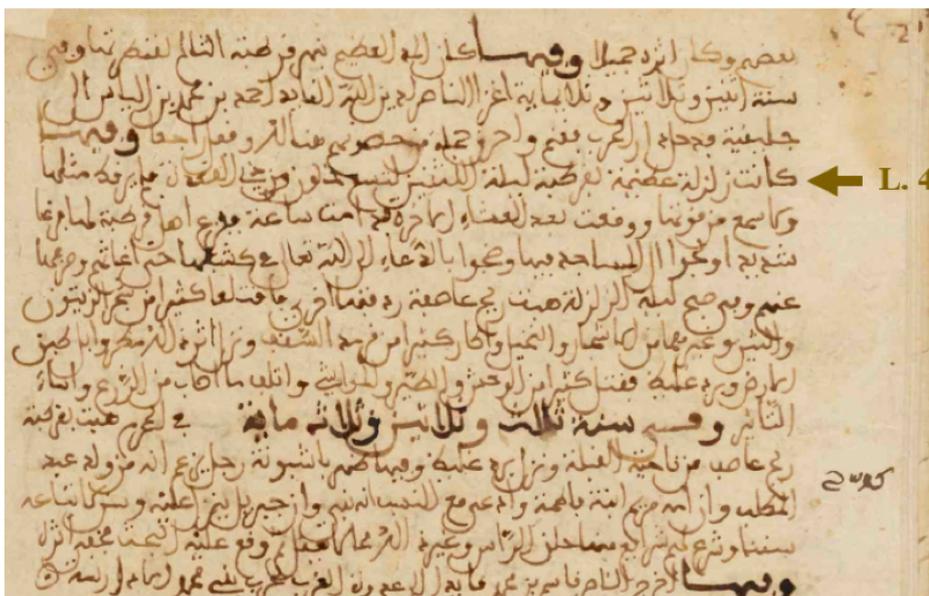
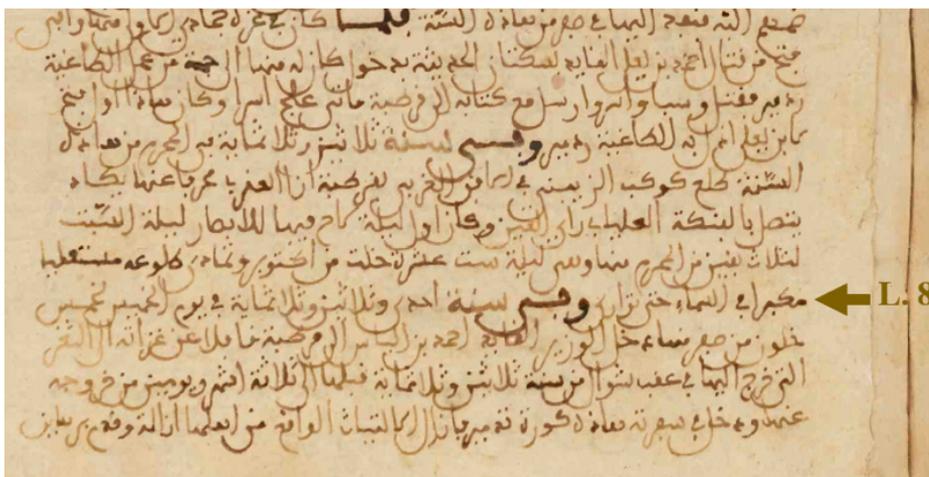


Figure 1: A facsimile of two pages of the manuscript of *al-Bayān*. In the section between line eight on the first page and line four on the second, different events dating from the years 331 AH (942 CE) and 333 AH (944 CE) are described that occurred in Cordoba, highlighting the temporal and spatial accuracy of the narrated events. See translation provided in the main text (Ibn Idhāri 1295).

the introduction of his work, al-Idrīsī writes: "The Earth is divided into two parts, between them the equator which is the longest line in the sphere. The circularity of the Earth at the equator position is three hundred and sixty degrees, and the degree is twenty-five parasangs... However, sixty-four degrees from the equator there are no building in the Earth due to the severity of the cold, the majority of living creatures are in the northern quarter of the Earth, and the southern quarter, which is above the equator is uninhabited due to its heat..." Ibn Khaldun (d. 1406), a social scientist and historian born in Tunis, included a passage about the regional variation of the climate and its impact on the human character in his book *al-Muqaddimah* (1378) (المقدمة). In his view, the inhabitants of temperate zones are temperate in their physical appearance and character and in their ways of life. They have all the natural conditions necessary for a "civilized" life, such as a means of making a living, dwellings, crafts, political leadership, and royal authority. They thus have religious groups, dynasties, sciences, countries, cities, buildings, horticulture, splendid crafts, and everything else that was considered "temperate".

Moreover, other Maghrebian historians developed a detailed style for ordering historical events, including descriptions of weather events at the time, which can be found in many precious manuscripts, such as *Kitāb al-Istiqṣā li-akhbār duwal al-Maghrib al-Aqṣā* (كتاب الاستقصا لأخبار دول المغرب الأقصى) authored by al-Nāṣirī (d. 1897). Al-Nāṣirī is considered to be the main historian of the 19th century in Morocco, as he compiled the entire history of Morocco in several volumes, as well as that of the Islamic West starting with the Islamic conquest by Qqba Ibn Nāfi at the beginning of the 8th century until the end of the 19th century. These volumes include numerous records of climatic information, which indicate, for instance, the wind speed: "In 919 CE, the strong winds uprooted trees and demolished houses in Fez (Morocco) and people stayed in the mosques." The same work mentions – apart from weather conditions and natural disasters – weather-related agricultural and economic events and processes, even with some details of the weight of fallen hailstones: "In 1324 CE, there was famine in Morocco and prices rose in all parts of the country. Wheat and other vegetables became very expensive in Fez, and this lasted until the middle of the following year... on Tuesday, 30 September of the same year, the sky outside the city of Fez was covered with a dark and thick cloud, stormy winds arose and heavy hail fell, a ball weighed at least a quarter of a pound and it rained heavily. The torrents came with silt, and carried people and animals, and destroyed in the mountain of Zalegh all the vineyards, the olives and the rest of the trees."

Another significant work from this region is the book *Kitāb al-bayān al-mughrib fi akhbār mulūk al-Andalus wa'l-Maghrib* written by Ibn Idhārī al-Marrākushī (d. 1296). This book is one of the most important and comprehensive examples of medieval Arabic history of the Maghreb and Iberia, generally known



Figure 2: Collection of manuscripts in a private library belonging to the heirs of Abdelkader Meklach in Tétouan, Morocco.

by its shorter title *al-Bayān al-Mughrib* (البيان المغرب), or simply as *al-Bayān*, reviewed and reedited by Colin and Lévi-Provençal (1984). It is valued by modern researchers as a unique resource, and for its preservation of excerpts from lost works. Furthermore, Ibn Idhārī followed a specific method in writing the book that drew on his broad knowledge of the contemporary literature and his access to many oriental and Moroccan writings, in addition to a long list of references that he included in the introduction to his book. Therefore, he was familiar with historical schools and writing styles that existed before his time, especially historical writing in the form of annals (historiographical literature). This method arranges historical events and lists them according to the succession of years and months and is very useful in pinpointing the timing of climatic events, especially when the writer narrates the time of their occurrence with high accuracy.

In his *al-Bayān* manuscript (Fig. 1), Ibn Idhārī mentions several important events that occurred in Cordoba, Spain, during the year of 331 AH (Year of the Hijra, roughly equivalent to 942 CE), such as: "In 942 CE, ... the great flood of the Cordoba river ..." In 333 AH (944 CE), he mentions events with extraordinary temporal and spatial precision, sometimes specifying the exact timing: "This year, a major earthquake occurred in Cordoba on the night of Monday, 3 Dhū al-Qa'dah (3 July), after the night prayer [on 3 July, the night prayer took place at 22:12], nothing like which had ever been seen or heard before, and it lasted an hour. The next day, the strong winds uprooted olive and fig trees as well as palms and took off roof tiles of the houses, then, torrential rains occurred with precipitation of massive hail and the killing of a lot of animals, birds, cattle and damaging crops."

Further potential

Historical climatology research demonstrates the great potential of the archives of societies of the Maghreb region for the reconstruction of past climate of the Mediterranean and beyond. This documentary data is characterized by high precision and a general accuracy of the descriptions of events. To date, texts from Arab historiography are hardly exploited in historical climatology. Furthermore, it must be emphasized that private and public libraries around the

world still contain important collections of unused manuscripts (Fig. 2), which may provide relevant data for the reconstruction of past climates in the western Mediterranean.

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