Thinking space. Digital mapping and semantic analysis for historical spatial narratives.
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Space is a matter of culture. In parallel with the *spatial turn* in the Humanities and the Social Sciences, it has been largely recognized that the spatial representation of the world is organized by human groups in different ways. Space is a social construction, and spatial perception is the result of multiple factors. In recent years, several investigations have been conducted on the representation of space in past societies. A significant step forward to reconstruct the spatial understanding of the ancient populations has been the focus on the interactions between space, knowledge, and language. The research group TOPOI in Berlin, for instance, explored the idea of space in ancient cultures through the lens of cognitive linguistics (Geus, Thiering, 2014). Furthermore, a crucial aspect in the current debate about spatial knowledge is the notion of 'common-sense geography', which refers to the tacit and intuitive knowledge that communities share about their environment. Since it is implicit and underlies the way in which human groups understand their surroundings, common-sense geography rises several challenges for scholars to be clearly decoded and interpreted.

In the broad spectrum of the Spatial Humanities, the analysis of historical geographic texts has enormously developed in the last few years. The scholarly debate on pre-modern geographies demonstrated that the strict use of GIS is limited when it is applied to traditions that are not conforming to the modern conception of space and spatial categories (Murrieta-Flores, Favila-Vázquez, Flores-Morán, 2019). The need to find new ways to describe historical representations of space led scholars to explore how spatial information is encoded into textual narratives, illustrating that wayfinding processes and spatial understanding in ancient societies are mostly unmapped and spatial relationships are expressed in qualitative rather than quantitative terms (Palladino, 2021).

In line with this research, during my talk, I will present my Ph.D. project (2022-2026), which investigates the spatial representation of Greece in Pliny the Elder's *Natural History* (1st cent BCE). The project aims at exploring how Greece is spatially described in Pliny's work, the first and largest Latin encyclopedia in Roman History. In 37 books, Pliny provided a comprehensive snapshot of all the knowledge available at the time, with the result that his work was considered by his contemporaries to be "A repository of science, not simply a book'. Despite the overall agreement on the influence of Greek culture and Greek sources on Pliny, the spatial representation of Greece in the *Natural History* is almost completely underinvestigated. The aim of the research is to investigate how spatial knowledge of Greece is structured in Pliny's extensive text (*knowledge graph*), with the goal of contributing to the exploration of how qualitative spatial information can be reconstructed from textual representations of space. This study will examine to what extent linguistic analysis can provide an access key to interpreting spatial narratives, by shedding light on the ways in which spatial knowledge is constructed and conveyed through language.

In the first part of my presentation, I will describe the objectives of my project and the methodologies that I will apply, mainly combining digital mapping and semantic annotation. By discussing the different steps of my workflow, I will also discuss the interoperability of Latin and spatial resources and their functionalities, and I will show to what extent my workflow is potentially reusable for similar research to explore unstructured spatial information

in historical documents. Then, I will illustrate in more detail some concrete examples of the first results of my research. I will show how the text was preprocessed and how information about Greek places was retrieved from Pliny's work (*geoparsing*). By relying upon an existing annotated English translation of the *Natural History* (ToposText), a new database of the place names in Pliny's books was constructed. Each place name is associated with the position of the mention in the text (book, chapter, paragraph) and with a persistent identifier. The database was enriched by adding the Latin name of the place (i.e., 'Athenae' for 'Athens') and some additional metadata, such as geographic coordinates from gazetteers (*named entity linking*). Secondly, the database was imported to Nodegoat and an interactive and multi-layered map was generated to visually locate the places that are mentioned in Pliny's description of Greece. Finally, starting from the dataset of place mentions a network was created. In the network, each node represents a place, and two nodes are linked if the places co-occur in the same text window. During the presentation, I will illustrate how the network permits us to preliminarily investigate which places are more often connected and more central in Pliny's geographic discourse about Greece. Further investigations will also clarify which kind of relationships exist between two or more places or between a place and another entity (*relation extraction*).

By describing my Ph.D. project's objective and preliminary results, with my presentation I set up to contribute to the ongoing discussion in the DH community on the extraction, analysis, and management of spatial data from historical textual sources. Focusing on the challenges encountered during my research and the potential solutions that have been developed, I aim to identify possible directions toward a standardization in the methodologies employed in Spatial Humanities by 'crossing the borders' between language, knowledge, and space.

References

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