Magnetic Margins. A Census and Reader Annotations Database

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Library catalogs (e.g. OPACs), and later the digitization of books as scans, were among the first digital means to facilitate research in the humanities. Ontologies such as CIDOC and FRBRoo consequently paid great or even exclusive attention to bibliographic records (Boot et al. 2021; Fenlon 2020; Golub / Liu 2021). Yet, one crucial historical and material quality of books tends to be neglected in existing databases: readers' annotations. Unique copies were possessed at different times by different persons or institutions and readers and owners left their traces on the printed pages (see Fig. 1).

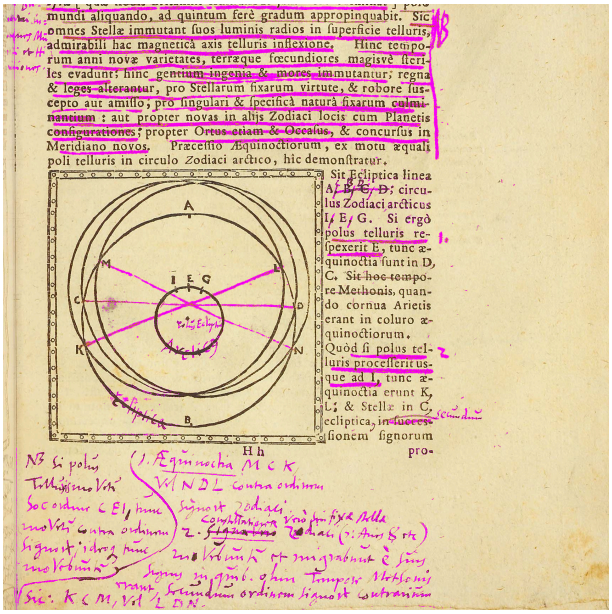

Figure 1. Example page crop with seventeenth-century reader annotations (digitally highlighted in pink). Source: HAB Wolfenbüttel <M: Nc 4° 46>, http://diglib.hab.de/drucke/nc-4f-46/start.htm?image=00279

These material sources and their spatiotemporal contexts are well known to book historians and have informed research for decades (Jardine / Grafton 1990; Jacquart / Burnett 2005; Jackson 2001; Sherman 2010; Orgel 2015; Acheson 2019; Grafton 2020; Chang / Grafton / Most 2021). And yet, this information is only rarely recorded as structured diachronic data in existing catalogs or databases.

This paper presents a platform providing a digital census of copies of a limited number of editions and mapping their owners and readers' annotations represented in an RDF framework. Its ResearchSpace (Oldman / Tanase 2018) instance, magnetic-margins.com, is the first of its kind, as it comprises structured and semantic data on unique copies, now held all over the globe, going beyond the mere digital editing of readers' annotations or the bibliographic collection of a corpus.

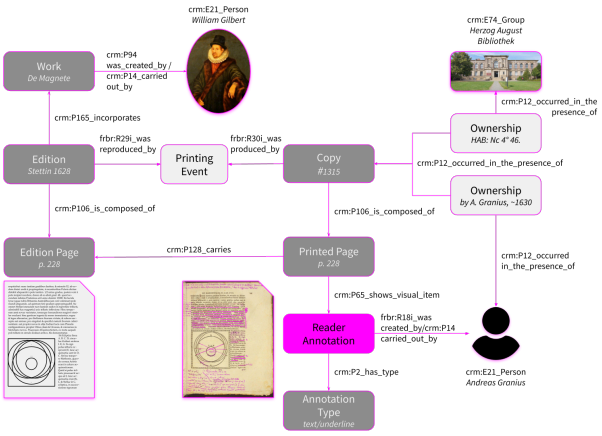

Figure 2. A simplified ontology diagram (most relevant entities with CIDOC-CRM relations)

Its cultural heritage data was gathered in a transnational collaboration where librarians provided provenance information on particular copies and surveyed these for readers' annotations, such as marginalia or underlining. This constantly growing dataset, encoded predominantly using CIDOC-CRM and FRBRoo (see a simplification in Fig. 2), is now made publicly available and serves as a rich basis to conduct sophisticated statistical analyses to uncover the interests of readers in the past: which pages of one edition across hundreds of copies have past readers marked the most? Which topics are dealt with on this page or in this chapter? Answers to these questions, based on a large amount of data, involving also computational full text analyses in future stages of the project, allow us to draw conclusions about the impact and relevance of historical ideas to an unthought-of degree. Researchers are enabled to answer these questions interactively through user interfaces (see Fig. 3) and custom SPARQL queries. Thereby, they transcend the established formats of library catalogs and digitization repositories as much as past readers transgressed the borders of the printed book, by making these static and generic objects their unique and dynamic notebooks and records of their learning.

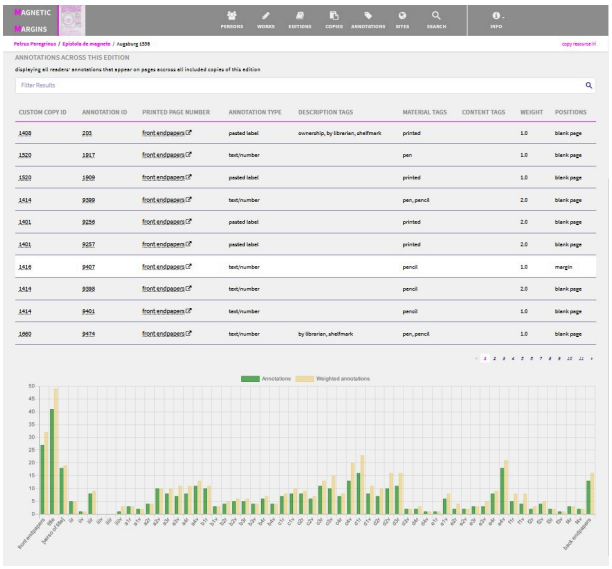

Figure 3. ResearchSpace UI view of an aggregated table and graph of reader annotations present in all copies of one edition

The historical research for this project emerged within the Max Planck Research Group “Visualizing Science in Media Revolutions” (Bibliotheca Hertziana – Max Planck Institute for Art History, Rome) and takes both a history of science and media history perspective. The corpus focusses on an important topic of early modern natural science: the investigation of magnetic phenomena (Sander 2020). The chosen landmark publications in this field of study between 1500 and 1650 represent a historical scholarly discourse that is both complex and dynamic. The current data comprises 5 works, 13 corresponding editions and 769 copies with 9339 annotations, modeled as over 100,000 RDF triples. Magnetic Margins is embedded in a multidimensional DH research project *Rara Magnetica* (ongoing), comprising, among others, TEI-encoded editions and image databases.

Transforming the established workflow (e.g., the migration from an extract-transform-load process upon a relational database to RDF-native curation), developing a formal thesaurus of reader annotations compliant with CIDOC-CRM and the Web Annotation Data Model, and extensively linking entities (with e.g. GND, VIAF, Wikidata or Getty AAT), are part of the evolution of this project and can easily be scaled and adapted for similar research projects. DH initiatives such as *The Future of Research in Early Modern Marginalia Studies* (ongoing), *The Vesalius Census* (ongoing), *The Archaeology of Reading in Early Modern Europe* (completed), and *The Sphere* (ongoing) could ingest their data in accordance with the Magnetic Margins data model and sharing its platform, leading to a mutually beneficial collaboration and linking of large data sets of historical scholarship. A so integrated knowledge graph allows interpreting material evidence within a conceptual framework situated in the history of knowledge. Doing so means advancing an inclusive and transdisciplinary research agenda, bringing together perspectives of paleography, book history, history of ideas, data and computer science, and statistics.

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