



# University Cultural Collections and Generative AI: Critical Approaches in a Library Context

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University Cultural Collections and Generative AI Fellowships  
University of Leeds Libraries

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## **Harnessing Generative AI: Opportunities and Concerns for Cultural Collections**

Generative AI is not a new concept, but it is currently experiencing a period of unprecedented prominence. The origin of this heightened attention can be traced back to the public launch of ChatGPT in November 2022, which showcased the viability of Generative AI chatbots as mainstream digital tools that produce relatively coherent and accurate responses to user prompts (Houston and Corrado, 2023, p.77). Drawing on large language models (LLMs) that can be trained on digital corpora encompassing trillions of words, these tools generate text-based outputs by predicting the probability of the next word or token in a sequence. The phenomenon of intuitive Generative AI interfaces underpinned by vast LLMs – first pioneered by ChatGPT, but soon joined by Claude, Copilot, DeepSeek, Gemini, Llama, and many others – now constitutes an inescapable feature of the digital landscape.

In light of this ongoing fixation as Generative AI approaches the peak of its ‘hype cycle’, it should come as no surprise that it has been the subject of countless studies from almost every conceivable perspective. Its advantages and drawbacks as a paradigmatic innovation in digital engagement have thus been considered in great detail. Even adopting a narrower focus, the literature around the application of Generative AI to cultural stewardship is still considerable in scope (Gîrbacia, 2024). A thorough survey of the current state of research in this specific field alone would constitute a sizable project in its own right. In the interest of brevity then, this study focuses on assessing the use of Generative AI tools to process cultural collections in their various forms and their accompanying metadata.

The integration of Generative AI into routine workflows could benefit the wider GLAMA field – galleries, libraries, archives, museums, academia – and their communities in profound ways. The labour of managing the mounting volume of online collections metadata is already considerable and will continue to grow apace with further enhancement. Cultural practitioners can utilise AI tools to harness vast amounts of digital data beyond the normal scope of human capacity in pursuit of greater collections accessibility and navigability (Reusens et al., 2025). Its potential capacity to scale up existing metadata enhancement initiatives cannot be ignored against a backdrop of growing demand. Not only can Generative AI tools help GLAMA professionals to document collections of greater scope, but these processes can be undertaken with greater sophistication. The selection, discovery, and retrieval of digital records can all be configured using more precise parameters with their assistance (Jaillant et al., 2025a, pp.18-21). The utility of Generative AI extends beyond the direct enrichment of collections metadata, it can serve with equal

plausibility as a means of refining the documentation process itself. Its expansive applicability could thus hold great promise for the GLAMA sector.

Generative AI tools are also adept at following specified rules, almost to a fault. They can perform complex operations at a user's behest, provided that they are given suitable direction. This has spurred the rise of prompt engineering as a distinct practice. The development of effective text prompts is a growing preoccupation for cultural professionals, requiring considerable thought and effort to be optimised for a specific task (Lo, 2023). This is often an iterative process that works to gradually adapt inputs to the undisclosed parameters of these proprietary technologies. An informed approach should therefore accommodate both the workings of Generative AI as a whole and idiosyncrasies of the individual platform in question. The same proficiency with structured data applies to the outputs of Generative AI. As the underlying LLMs are instructed to recognise patterns in their training data, Generative AI is especially proficient at generating outputs that follow a clear set of rules – code, bibliographic standards, or academic referencing systems (Moulaison-Sandy and Coble, 2024, pp.379-380). Through its systematic internalisation of formatted textual information, it can achieve a standard of consistency that would otherwise be incredibly laborious to maintain. Ultimately, Generative AI excels in an environment where there are clear terms of engagement for both inputs and outputs.

On the other side of the balance sheet, a major drawback of Generative AI tools is their inconvenient habit of 'hallucinating'. In the GLAMA field, this has been manifested in their regular invention of academic references that have turned out to be entirely fictitious (Montague-Hellen, 2024, p.2). In a metadata context where accuracy is paramount, this propensity for factual inaccuracies within generated outputs represents a major challenge that cannot be dismissed lightly. A recent peer-reviewed article advocating the wider adoption of ChatGPT as a cataloguing tool attracted criticism for overlooking a series of registration errors (Amram et al., 2023; Brzustowicz, 2023; DeZelar-Tiedman, 2023; Floyd, 2023). Generative AI in its current state of development cannot consistently perform cultural documentation to the expected standard, at least not without supervision. As long as there is a real chance of mistakes routinely occurring, there will be a need for external input during this process – reinforcing the position that all Generative AI operations should be subject to human oversight in some form. The key question then becomes one of efficiency, does the task of verifying AI outputs create more labour than it saves? The answer will ultimately depend on the situation at hand.

Professional reservations are not solely confined to Generative AI outputs, the creation process raises its own share of difficulties. The lack of transparency around

data collection and processing is especially pertinent to GLAMA institutions. The reality is that their digital collections catalogues are routinely harvested by LLMs, irrespective of any copyright or licensing conditions. The prevailing legal situation is ambiguous on this point, but in the UK the *Copyright, Designs and Patents Act 1988* does allow the text mining of copyrighted works for non-commercial purposes (Sichani, 2024). Even so, cultural professionals should strive to maintain robust standards of openness and accountability in their own use of Generative AI. The concept of 'Explainable AI' offers a compelling ethical framework for this work that foregrounds the underlying materials and processes involved in the generation of outputs (Tóth et al., 2025). In short, the obligation to show its working. Embedding the open publication of input parameters, text prompts, and attribution statements as routine practice for GLAMA engagement with AI tools forms a concrete basis for their responsible usage going forward. After all, professional integrity demands that the provenance of Generative AI outputs should be subject to the same rigorous scrutiny as all other sources of cultural metadata.

Then there is the human dimension to this work, which underpins all of these other considerations. As with all tools, Generative AI is only effective in proportion to the knowledge of its user. However, there is still considerable work to be done to cultivate professional understanding of its operations and ramifications across the GLAMA sector. The realities of professional specialisation have produced a situation where many cultural collections practitioners are separated from the inner workings of digital infrastructure (Dunsire and Vukadin, 2024, pp.595-596). This gulf can be difficult to bridge in practice. Training opportunities in the cultural applications of Generative AI are still limited in scope, so it often falls to individual practitioners to self-teach the rudiments of computational methods (Jaillant and Aske, 2023). But this is hardly a sustainable approach to professional development once the routine operational responsibilities of collections stewardship are taken into account. Systematic programmes of instruction will likely be required if GLAMA personnel are to be effectively prepared to engage with Generative AI in all its complexity. In an environment where the UK Government has declared its intention to incorporate cultural data into commercial training agreements (Clifford, 2025, p.10), professional awareness of AI functionality will be a crucial asset going forward.

University of Leeds Libraries has taken positive steps in this direction as part of broader institutional efforts to navigate this unprecedented technological landscape. The University has developed a suite of guidance around artificial intelligence, culminating in a position statement issued in May 2025 that enshrined inclusivity, integrity, and collaboration as the basis for all engagement with Generative AI (University of Leeds, 2025). Within this strategic vision, University of Leeds Libraries

has been proactive in considering the specific implications of Generative AI for the cultural sector. On the policy side, it issued the exploratory *Looking Towards a Brighter Future* report in 2023 examining the potential role of AI to help transform the wide range of services carried out by academic libraries. Its recommendation to enable ‘a sense of moving between texts and artifacts’ has certainly resonated with the objectives of this project (Pirgova-Morgan, 2023, p.99). In parallel, University of Leeds Libraries has also pursued practical actions to foster greater occupational familiarity with Generative AI. In 2024, it trialled the use of the integrated Microsoft 365 Copilot software among its staff to gauge internal interest and determine the feasibility of a wider rollout (Wheatstone et al., 2024). Technical competence is steadily being cultivated across the organisation. All of these initiatives have then fed into the University of Leeds Libraries AI Principles, comprising ten commitments to foster responsible use of Generative AI (Knowles, 2025). While all of its provisions have shaped the development of this project, its calls to ‘encourage experimentation’ and for ‘open access to collections’ have been especially influential on the development of this project. Ultimately, these fellowships have worked to uphold the growing precedent at University of Leeds Libraries for critical engagement with Generative AI as both a research subject and an operational tool.

### **Cultural Collections at the University of Leeds**

The University of Leeds is the custodian of a world-class body of cultural collections across its libraries, its two galleries – the Stanley & Audrey Burton Gallery (SABG) and the Treasures of the Brotherton (TOB) – and its specialist research centre at the Brotherton Library. The collections consist of myriad rare books, manuscripts, incunabula, archives, textiles, numismatics, fine art, ephemera, works on paper, and public art. Five collections in the University’s care have been identified by Arts Council England as of exceptional national and international significance under their Designation Scheme (Arts Council England, 2024). These include the English Literature Collections, the Cookery Collection, the Gypsy, Traveller and Roma Collections, the Leeds Russian Archive, and the Liddle Collection of First World War history. Other notable holdings include the papers of sociologist Zygmunt Bauman and his wife, the author Janina Bauman, the library and archive of art historian and critic Herbert Read, the Leeds Archive of Vernacular Culture, the Women’s Aid Federation of England archive, the Leeds Philosophical and Literary Society archive, and the Yorkshire Quaker Archive.

The University continues an active acquisitions programme and regularly commissions new works of visual and material art through its galleries. Recent instances include Sarah Roberts’ ‘SICK (A note from 40 Sandilands Road and other

stories)', an immersive installation in the SABG that considers the sensory and emotional of the home and the hospital drawing upon the artist's own experience as a young carer, and the bequest of the John Evan Bedford Library of Furniture History. Such works contributes to the University ongoing Cultural Collections and Galleries Audience Development Strategy and the Library's 'Knowledge for All' plan (University of Leeds Libraries, 2022; Beare, 2024).

At the heart of the University's strategic aims for its cultural collections is a recognition of its tandem role as a centre for research excellence and as a significant actor in the local and regional cultural infrastructure. To this end, the galleries and research centres host annual exhibitions of work by Leeds students and are open to members of the public. Both TOB and SABG are accredited by VisitEngland's Visitor Attraction Quality Assurance Scheme, while SABG is also accredited by Arts Council England and its digitised collection is publicly accessible through ArtUK. Digital futures play a crucial role in efforts to expand the public reach of cultural collections at Leeds. The Digital Libraries Infrastructure Project and the work of the Digital Creativity and Cultures Hub (DCCH) is underpinned by a commitment to the increased accessibility and inclusivity that can be supported by digital development in cultural heritage. Examples to this end include the Library's adoption of the International Image Interoperability Framework (IIIF) and the hosting of its annual conference in June 2025, the involvement of DCCH colleagues in the collaborative Congruence Engine project, and ongoing digitisation and infrastructure support work with Keighley Library – notable for its contribution to Bradford's role as the 2025 UK City of Culture. These projects have successfully capitalised on the opportunities created by digital infrastructure to support local partners within an ethos of collaboration and inclusivity.

As such, the University of Leeds Libraries and Cultural Collections demonstrate a progressive and expansive approach to digital methodologies. It is within this remit the University Cultural Collections and Generative AI Fellowships have operated and have sought to capitalise on the specific methodological and strategic prescience of AI at Leeds, as well as the wider ramifications and possibilities for cultural collections and GLAMA work. These fellowships – summarised below – have sought to create tools, expand methodologies, and offer a variety of approaches to this work. The short-term nature of these fellowships lasting only six to eight weeks, while limiting in some obvious regards, has nonetheless enabled experimental and independent work to develop tools or processes that might be developed and embedded in the University of Leeds research ecosystem, to consider applications for audience and student engagement, and to encourage continued interdepartmental and interdisciplinary collaboration.

## **Generative AI as Cultural Collections Research Collaborator: The Bedford Trade Card Collection**

This project took as its point of departure a collection of 587 trade cards, billheads, and tickets in the John Evan Bedford Library of Furniture History and harnessed Generative AI in the development and analysis of maps to consider networks, connections, and themes across the collection. In doing so, the project considered how digital methodologies can be integrated with formal art and material historical approaches and how these outputs can be integrated into the University of Leeds' teaching and learning resources. The project also considered the ethics and methodological utility of the application of Generative AI tools to research and asked what parameters and frameworks ought to be developed in the selection and deployment of Generative AI in this context. The methodological intent of the project was to work through these foundational questions actively and experimentally through doing; troubleshooting and iteration was imperative, as was failure and redirection. This approach was guided by the University of Leeds' values-driven academic strategy informed by collaboration, compassion, inclusivity, and integrity (University of Leeds, 2020).

### **The Trade Collection: Background and Literature**

The John Evan Bedford Library of Furniture History was bequeathed to the University of Leeds Libraries in 2019. It contains over 5,000 items dating from the seventeenth century to the present day and includes photographs, cuttings, books, and ephemera relating to the breadth of furniture and design history. Sitting within this archive is the trade card collection – the majority of which date from the nineteenth century and span locations from Leeds to Osaka. Trade cards functioned as calling cards for traders; a 'typical' trade card will provide a trader's name, industry, and location (Figure 1). More elaborate examples might be highly decorative, Belgian *cartes porcelaines*, or chromolithographs (Figure 2). Outstanding examples include interactive and three-dimensional elements, including fold outs and pop-ups (Figure 3).

The trade card collection is exceptional in its utility for researchers. Its physical extent – 587 objects arranged in three folders – enables detailed visual analysis and examination, while its digital presence is similarly expansive. Thanks to the industry of Library colleagues during the COVID-19 pandemic, each of the 587 trade cards are individually catalogued and described both in the University's collection management system (EMu) and publicly online and digitised with a IIIF manifest. The combination of physical cohesion and digital accessibility, complemented by the

wealth of institutional expertise available at Leeds, ensures that it is a prime body of material for an open research project of this type.

It is also the case that a critical analysis of ephemera is integral to scholarly discourse in the history of collections and material culture studies. Eleanor Gruber Garvey's *Writing with Scissors: American Scrapbooks from the Civil War to the Harlem Renaissance* insists upon the utility and necessity of ephemera in examining complex historical identities and networks and for recovering histories previously hidden (2012). Maureen Daly Goggin and Beth Fowkes Tobin's *Women and Things, 1750-1950: Gendered Material Strategies* continues in this vein and articulates how quotidian material culture has served as a vital outlet for the articulation of gendered historical lives (2016). The research fellow's own doctoral research argued for a materially-expansive understanding of the collection in histories of art to better outline a heterogeneous and diverse narrative of collecting in the nineteenth century (Varley, 2024). The trade cards, when examined from such a perspective and informed by the work made possible by Generative AI tools, offer a way into examining the relationship between individual objects and a wider collection, and the potential art/material historical conclusions therein. Central to this is a literature that emphasises the utility of the network and of global mobility to more expansive and connected histories – key texts here include *From the Tagus to the Ganges* (Subrahmanyam, 2005) and *Aesthetic Painting in Britain and America: Collectors, Art Worlds, Networks* (Deusner, 2020). In digital humanities, the 'Animating the Archive' series by born-digital journal *British Art Studies* encourages creative ways of representing and analysing historical material engendered by the possibilities of digital publishing (Kokoli, 2024).

Mapping in particular emerged as a useful tool through which to visualise the networks at play in the trade card collection for its ability to negotiate between the atomised and the collection; this is a necessary aspect of the critical history of the collection that can get lost in the process of cataloguing. Claire Warwick and Katherine Aske argue that 'maps can present bias and misinformation, national priorities and global perceptions – they represent time and space, creating endless avenues for analysis' (Warwick and Aske, 2025, p.113). Once again, there is significant (art) historical precedent here. Pamela Fletcher and Anne Helmreich's groundbreaking *London Gallery Project* (2007) sought to document the history of the commercial gallery across London from 1850 to the outbreak of the First World War. It originated as a tool to help scholars organise, visualise, and interpret the vast amount of data uncovered by Fletcher and Helmreich in their analyses of historic art markets. The project resulted in an interactive map and searchable metadata, as well as a monograph (Fletcher and Helmreich, 2012; Fletcher and Israel, 2012;

Fletcher and Helmreich, 2013). This project demonstrated the scope and utility of digital methods for art-historical research but was, frankly, bound by the technological capabilities of its time. The resultant map, for example, utilised Adobe Flash for its functionality. Adobe ended support for Flash Player in 2020 and blocked Flash content from running in 2021. The map is therefore no longer usable, although hyperlinked gallery lists remain functional. This is, of course, indicative of the progressive obsolescence of software that acts as a cornerstone critique of digital methodologies – it also offers a foundational opportunity to consider how rapidly developing technologies, including Generative AI, may be harnessed to ensure the future longevity of research outputs.

### **Process and Selection of Tools**

There is a rich and extensive landscape of software products available to support analytical mapping projects. ArcGIS and DigiMap, for example, enable geospatial imaging and the manipulation of geospatial data; ArcGIS Storymaps creates interactive geospatial images. AllMaps curates and georeferences IIIF maps, while Humap is specifically tailored towards the development of interactive maps for digital humanities projects – one notable instance being the London School of Economics Library’s ‘Charles Booth’s London’ project which enables interactive exploration of the reformer’s groundbreaking poverty mapping project as part of his *Inquiry into the Life and Labour of the People in London* of 1886-1903 (London School of Economics and Political Science, 2016). Humap, however, is not currently licenced by the University of Leeds – given the time-limited and intensive nature of this project, it was imperative that any software resources were readily accessible and already approved for use. Similarly, ArcGIS’ focus on archaeological and geographical mapping ensured that it did not fully support the data-visualisation aims of the project, while AllMaps’ focus on the presentation of IIIF *images* of maps ensured that it did not facilitate the sort of interactivity and customisation required.

As such, Felt was selected as an appropriate platform for this project. Felt is an integrated cloud-native GIS (Geographic Information System) platform that allows users to develop and analyse maps from a range of information sources, including CSV files, URLs, and images. Thanks to Felt’s integrated artificial intelligence features and sophisticated user interface, it is possible to build a map from essentially any form of geospatial information – coordinates, street addresses, and so on – with little to no requirement for specialist knowledge of coding or GIS platforms. Felt, then, functioned as an incredibly user-friendly and accessible platform with which to experiment; its extensive package of video tutorials and active Subreddit further supported the exploratory intent of this research project. Similarly,

the software had recently been licenced by the Digital Creativity and Cultures Hub and as such was already approved for us.

Once the primary mapping software had been selected, it was necessary to then select the Generative AI tools that would be used to support and extend this research. Owing to the need to ensure that any AI tools conformed to the University's standards for data security and management this was a relatively straightforward process. Microsoft Copilot is the only Generative AI platform that is already fully integrated into the University's IT package and to which all members of the community have immediate access. As part of the broader Microsoft 365 portfolio, Copilot is sandboxed and secure through its enhanced Enterprise Data Protection safeguards, removing any potential ethical and intellectual property issues that are present when using open-source Generative AI platforms. The only other LLM approved for use by Leeds is Anthropic Claude, however any prospective users must request approval for its use – owing to the time-limited nature of the project and with a wish to avoid any delays as a result of the approval process, the decision to move forward with Copilot was the most appropriate and rational.

There were limitations to both tools. While Felt was user-friendly and adaptable, the range of search functionality and interactivity was notably limited as a front-end user compared to one with editing privileges. There were limits to customisability in line with DCCH's licensing of the software – IIIF images could not be fully integrated, nor could Felt search for multiple trade cards at once for comparison. It became quickly apparent that more sophisticated functionality was required to use the map as an analytical or storytelling tool. Similarly, Copilot was helpful for quantitative and descriptive tasks and was able to offer some exploratory analytical suggestions from which to develop. It did, however, lack the critical sophistication and reasoning capabilities of more advanced LLMs; were the research fellowship longer, it would have been possible to experiment with these tools to consider which might be more appropriate for the needs of the work. Time-based pressures further limited the potential for tool experimentation because of the uncertain and potentially lengthy internal approval and ethical review processes.

## **Phase One – Implementation**

As emphasised above, one key benefit of Felt is its ability to generate interactive maps from a broad range of information sources, including Excel spreadsheets. Thanks to the excellent work of Library colleagues following the bequest of the Bedford collection during the COVID-19 pandemic, such information is notably well-organised and accessible. The collection metadata includes, among other

categories, coordinates connecting each trade card to the location of the trader. As such it was possible to directly upload this information into Felt. Felt then successfully plotted each object at a location with a navigable pop-up that presented other elements of the metadata – for example, the object description, catalogue identifier, and Theseus viewer link.

However, this initial location data was linked only to cities, towns, and villages. This resulted in multiple objects in the same city being plotted at exactly the same point – all 222 trade cards from London appeared, for example, at the same coordinate. While the user was able to scroll through these objects, the analytical potential of this first iteration of the map was limited owing to its lack of granularity and the clumsiness of its functionality. Street address information was available for almost every object in transcriptions included in the collection metadata – once again as a result of diligent and thorough cataloguing, reinforcing the necessity of creating excellent and well-organised metadata from the outset of a cataloguing project and the significance of the thorough and committed work of Library colleagues. Beginning with the trade cards listed with a location in London, Copilot was used to extract any street names and address information from individual cards and to present them as a new column in the metadata spreadsheet. Copilot was both accurate and efficient in collecting this information, although at times did produce multiple addresses per object, particularly when the card printer's address was also listed on the object alongside the trader for whom it was advertising, or when a trader occupied multiple sites or perhaps had both a factory and a showroom – Josiah Wedgwood's Staffordshire site and London showroom being a prime example (Josiah Wedgwood & Sons, 1891-1904). This information required some manual sense-checking and cleaning but nonetheless resulted in an end-to-end process that took less than half a day – a significant reduction in a workflow that, although possible, would likely have multiple days if done entirely manually. Some curatorial oversight was also necessary here; in instances where multiple locations were listed, I followed the lead of the original metadata – for example, Wedgwood's trade card had been originally catalogued with Etruria, Staffordshire as its primary location rather than the London showroom and as such I carried that same logic into this iteration.

From here, Copilot was then prompted to generate coordinate information for these addresses. The updated metadata was then reuploaded to Felt. In most instances, objects were now accurately plotted at street level although Felt was unable to georeference thirty-six listed addresses. Given the historic nature of the objects and the rapidly changing urban planning of cities like London, this was unsurprising. In many cases – particularly in East London – Victorian streets have been destroyed in

the intervening decades, post-war estates such as the Barbican have redefined the spatial organisation their locale, or – in central locations like the Strand – street numbering has been radically altered as a result of redevelopment. Copilot was prompted to offer plausible contemporary equivalents for these addresses and to update coordinates accordingly.

This information was reuploaded to Felt, now with almost all of the points successfully plotted (Figure 4). The small number of outliers could be clarified manually by cross-checking historic maps and drawing on common knowledge – Rolls Brothers' trade card lists an address at 'Grand Surry Canal Bridge, Old Kent Road.' This now corresponds to the area around Burgess Park and the Surrey Canal Walk in Peckham, southeast London. Any remaining instances where duplicates were listed were corroborated as either duplicates in the collection itself, or as multiple traders at the same location over time. After the accurate refining of the London data, the process was extrapolated globally. In almost all cases this was achieved successfully, although a small number of cards remain duplicated in Ghent. Copilot was once prompted to clean these addresses although was less successful than with London and addresses in the United Kingdom – this is plausibly a result of historic locations being no longer extant or perhaps because of the multilingual nature of these cards. Manually cleaning this data is possible, although has not fallen within the scope of this short-term fellowship. Now that individual plot points were satisfactory, Copilot was prompted to group cards into loose 'job families' and to update them as different coloured layers in Felt such that the map was now navigable not only by individual object and location but by industry.

As such, in its current form the map acts as an effective visual index of the collection with which users are able to get a 'big picture' assessment of the collection as a whole in conversation with the individual objects. It is also shareable and embeddable and, hopefully, can be integrated into the online Cultural Collections catalogue. It has not been possible within the scope of the project to further refine the interactivity of the map; fully integrating IIIF images to the map would aid functionality, connecting objects to Wikidata would facilitate further network building, as would the possibility of integrating navigable layers from other IIIF sources (for example, Booth's poverty maps). Nonetheless, with access to Felt's integrated artificial intelligence plug-in or further work on prompting Copilot to develop independent scripts it would be possible to continue to develop these interactivities and indeed the overall potential of the project.

## **Phase Two – Analysis**

The central premise of the analytical scope of this project was to consider what Generative AI could do to support and extend formal archival research. When sitting with the Trade Card collection, I was struck by its anachronism. The individual objects are, of course, highly informative, decorative, and compelling – their materiality is greatly pronounced in the archive. What is also striking is the clear presence of the collector in their organisation. The trade cards were organised by Bedford into three ring binders which continue to provide the basis of their curation at Leeds. Each binder is arranged by category, although these are loose and open to broad interpretation. They are numbered individually and arranged according to the collector's original arrangement; this means there are gaps in folders, computer prints out of cards not yet collected, and duplicates. The presence of the collector when viewing the trade cards in person was palpable in contrast to the atomised and idiosyncratic experience of exploring the online catalogue – an attempt to mediate these contrasting experiences was central to the logic of the mapping project and while I am confident that this has been achieved effectively within the scope of the project, it was my intent to move beyond this to begin experimenting with the sorts of conclusions and analysis that could be intimated when incorporating Generative AI into this process. The aim of this aspect of the project was not to commence any specific programme of research, but to consider and explore the potential of Generative AI for spawning and developing research questions, research topics, and exploration of the collection in its entirety.

To begin, then, Copilot was prompted to consider the Felt map. It was initially asked to provide a summary of the collection – it did so effectively and accurately, outlining the scope, contents, and background of the visible material (Figure 5). In general terms, the potential of Generative AI to generate these sorts of summaries has positive implications for making collections increasingly accessible to students and researchers by providing a detailed overview of a collection during the exploration and source-identification stage of a project. Such summaries do exist for the trade card collection as a result of the diligence of Library colleagues during the processing of the bequest, but this is certainly not unilateral across Cultural Collections and is dependent on factors such as the moment of acquisition and the capacity of available team members. Here, incorporating Generative AI could help streamline workflows and provide a foundation upon which internal knowledge can extend.

From this initial summary, Copilot was prompted to identify connections across the objects. It offered a range of thematic responses, including multiple instances in which individual trade cards had been designed or printed by the same engraver and/or printer. In an art-historical landscape in which the political potential of

printmaking is being foregrounded, this offered a potentially rich area for further interrogation (Chadwick, 2024). Copilot was then prompted to visualise these connections; given the scale of available information, though, the resultant graph was effectively illegible and contained a number of inaccuracies whereby printers and traders had been conflated and hallucinated (Figure 6). To problematise this approach, Copilot was prompted to focus down on one location – in this case Exeter (Figure 7). The resultant visualisation continued to reproduce some inaccuracies, but nonetheless did effectively pull out a number of recurrent names of printers and engravers that could provide a functional point of departure for further research.

Copilot was then prompted to visualise the recurrence of specific iconographic motifs across the collection and produced a useful visualisation of this (Figure 8). Copilot could then be prompted to refine these results to compare, for example, the recurrence of motifs of decorative metalworkers in Paris and Ghent (Figure 9). These visualisations once again could provide a fruitful point of departure for future research and, in particular, could aid a remote researcher in examining the collection en masse during the exploratory phase of research without the need to visit Leeds in person – this has significant potential regarding not only access to the collection, but also for environmental sustainability and the minimisation of unnecessary international travel. Finally, Copilot was prompted to produce a spreadsheet of instances in which information potentially relating to international trade – tea, spices, and so on – was mentioned (Figure 10). The resultant output offers a framework through which research into potential colonial ties or global networks of trade in an imperial context might be further explored. The necessity of this sort of analysis of the collection is imperative; collections inherently reinforce the individual and contextual biases of the collector. They reflect the aims, interests, and idiosyncrasies of an individual. Generative AI is effective at recognising patterns but often lacks the critical ability to interrogate and make meaning from these patterns and can therefore repeat and reinforce these inherent biases (Dikow et al., 2023). To evaluate the colonial and imperial networks within the collection is therefore an opportunity to not only interrogate the limitations of the collection itself, but the ethical and methodological limitations of Generative AI as a collaborator in arts and humanities research.

## **Conclusions**

What follows are conclusions drawn specifically from the analytical process of this project. Any conclusions and recommendations related to software, tools, and process can be found in the collective conclusion at the end of this report.

Generative AI tools offer notable benefits to research processes and to the development of research outputs. The project has demonstrated their utility for refining and cleaning data expediently and their ability to help bridge skills gaps in researchers and thus make available digital tools and methods that might previously have been inaccessible. Generative AI tools can also act as helpful collaborators and interlocutors in the exploratory phase of a research project; their capacity to sift data and produce results in seconds ensures an expediency that is simply impossible when done manually. This has significant implications for the ability of remote and precarious researchers, as well as those balancing multiple workstreams and priorities, to engage with collections efficiently and creatively.

Generative AI in this instance was also helpful in negotiating the blind spots that often occur when working with collections of this type. While Copilot does not yet possess the analytical and critical capacity to fully interrogate these omissions – for example, the geographic skew in the collection not only to England, but to London and Birmingham – it was able to successfully identify and visualise patterns that could then be analysed and considered independently. Similarly, the project's aim to mediate between individual trade cards and their function in the collection as a whole was expedited and enabled by the ability of Generative AI to recognise patterns across the entire dataset at pace. This sort of digital analysis corresponds to and supports research conclusions drawn when working with the collection in situ – that is, an awareness of it as a self-contained, constructed, and curated body of objects that reflects the interests of an individual. This coherence is somewhat lost in an online catalogue that atomises each object and as such makes it difficult to make any sorts of connections or conclusions across the collection without working with it in person.

Implicit in these conclusions is the capacity for Generative AI to support teaching and research into bias and the limits of knowledge. At no point did Copilot identify the idiosyncrasy of the collection as a concept and the ontological role of the collector in its contents and organisation. Such a recognition is a fundamental principle in the history of collecting; its absence in any of Copilot's conclusions makes a clear case for the use of Generative AI as a focus against which skills of critical analysis can be developed. This takes on even more significant charge when considering the implications for collaboration and access made possible by Generative AI. Its ability to support short term, precarious, and remote research is significant, as well as its ability to support work across departments, disciplines, and nations. Such collaboration is already in place at Leeds – the collaborative project 'Affect, Algorithms, and Archives: Reclaiming Emotions and Relationality in Digital Spaces', led by Dr Dibyaduti Roy, operated across sites in Leeds and Bengaluru, India and

utilised artificial intelligence to trace the affective responses of participants to works of art beyond the 'flattened' nature of historic and geographic metadata (Leeds Arts and Humanities Research Institute, 2023).

The incorporation of Generative AI into processes of cultural collections research also raises core questions about what skills and processes are imperative to the discipline. What skills must be maintained and developed in the face of technological advancement to extend criticality? What skills are no longer prerequisite, or what skills can be bypassed altogether? From an art-historical perspective, it will, of course, remain necessary to critically evaluate visual and material culture and to use iconographic content to draw historical conclusions. It will remain necessary to understand technical process and to recognise the limitations and omissions in bodies of objects. It may not, however, be necessary to learn computer programming in instances where sophisticated Generative AI can bridge this gap. It may also not be necessary to use valuable research time to gather quantitative information about a collection – it would have been possible, for example, to gather information about the recurrence of iconographic elements in the corpus manually but this would have been time consuming and liable to human error. In the context of a particularly short-term research project, any tool that can achieve in seconds that which a human could achieve in hours, if not days, must be beneficial for the facilitation of wide-ranging and accessible research.

There remains much to be explored in the Trade Card collection. With further research, they might provide a window into global trade networks in the long nineteenth century; their iconographic content might reveal a set of cultural codes by which traders and patrons alike established relationships; their geographic locations might help invigorate an awareness of the period as mobile and connected. While it has not been possible to fully investigate this potential, this project has demonstrated how Generative AI might help to support and extend cultural collections research. It has demonstrated the heterogeneity of ways in which Generative AI can act as a research assistant and, in doing so, has demonstrated a variety of tools and approaches that might be able to support researchers and interested parties across departments and disciplines.

# **Metadata as Mediator: Harnessing Generative AI to Integrate University Collections, Archives, and Research Outputs**

## **Conceptualising Connections: From GLAM to GLAMA**

By providing acknowledgment or citation, you enable others to verify, replicate, and further explore your presentation and interpretation of our data. And it's just nice. (Getty, 2025)

The origin of this study was a simple premise: is it feasible to develop a routine process for creating navigable links between heritage objects and research publications. Cultural collections maintained by institutions across the Galleries, Libraries, Archives and Museums (GLAM) sector have long been the foundation of original and innovative research (Keene, 2005, pp.45-65). Their scholarly contribution has been captured to a greater or lesser extent in published outputs through the convention of academic citation. While these references are essential in a research context for integrity and reproducibility (Pears and Shields, 2025, pp.1-2), they only operate in a single direction – from the research output to the cultural collection. The inverse process of linking from the cultural collection to any related research outputs, however, is not embedded to an equivalent extent within routine GLAM practice. This work relies primarily on manual reviews performed by individual cataloguers responsible for collections documentation, a desirable form of record enhancement that all too often must give way to more immediate duties (Spidal, 2019, pp.338-339). In many cases, cultural practitioners may not even be aware that institutional holdings have been cited elsewhere if there has been no direct communication by the researcher. In light of these challenges then, this project has sought to explore intuitive approaches to foreground these conceptual associations.

A persistent barrier to this work – and many other related documentation procedures – is the difficulty involved in justifying its implementation within prescribed operational parameters. It is not enough for metadata improvement to be useful in of itself, it must have demonstrable impact. At a strategic level, formalising the connections to research outputs can help to quantify the wider impact of cultural collections. In a policy environment where cultural institutions are encouraged to publicise the use of their collections as a measure of their societal value (Charlesworth et al., 2023, pp.148-150), attributable research publications provide a tangible expression of active engagement that may otherwise go unrecorded. They represent a qualitative complement to the raw figures of page views and interactions that normally dominate the reporting context of online collections catalogues. The other major benefit of systematically recording the appearance of cultural collections in research is more prosaic in nature but equally as important. It works to facilitate user exploration by presenting these associations in a clear, consistent, and

navigable format. The presence of a Uniform Resource Locator (URL) or a Digital Object Identifier (DOI) in particular provides a means of transporting users to new materials and unanticipated perspectives. It can thus be framed as a practical strategy to help make heritage objects more ‘accessible and meaningful to everyone’ by showcasing the wider intellectual context in which they are situated (Bailey et al., 2024, p.55). In short, the development of these links plays a modest part in the collaborative endeavour of breaking down disciplinary silos to build an interconnected online infrastructure for cultural collections.

This effort has drawn its inspiration from the GLAM concept, which encourages cultural institutions of all kinds to pool their expertise and resources to achieve common aims. Promoting interdisciplinary connections between the different facets of digital heritage has the potential to raise collections visibility across the board. It also better accommodates the operational reality that cultural institutions often manage holdings that span a number of these nominally distinct collection types. Many museums and galleries maintain documentary records associated with their holdings, while libraries and archives are known to develop special collections incorporating an array of material effects. The situation can prove even more complicated in the case of universities. Not only have they routinely amassed an array of GLAM collections for teaching and study, but many institutions have also established dedicated research repositories for newly published outputs. As a storage infrastructure for the long-term preservation of unique material entities and their associated information, these repositories share much in common with other cultural collections. It is perhaps not surprising then that an extended version of the original acronym has started to appear, taking the form GLAMA – galleries, libraries, archives, museums, *and academia* (The National Archives, 2025). There is clear scope for collaboration between cultural professionals across these allied fields, not least in their concerted efforts to foster new connections. By surfacing the latent links between research repositories and cultural holdings, this project has sought to realise the potential of a holistic university collections ecosystem.

The institutional context of University of Leeds Libraries serves as an ideal test case for this endeavour. Viewed in their entirety, its cultural holdings span the full spectrum of the GLAMA field. As would be expected for a university library, it maintains expansive print collections as the fundamental basis for its teaching and research activities. Then there are its Cultural Collections holdings deemed to be of special significance owing to their originality, which encompass archives, manuscripts, artworks, and objects. University of Leeds Libraries also co-manages two publications repositories as part of the White Rose Libraries consortium: White Rose Research Online (WRRO) for academic outputs and White Rose Etheses

Online (WREO) for doctoral theses. Finally, its Research Services team operate a suite of repositories to hold research data of varying sensitivity: Research Data Leeds, Restricted Access Data Repository (RADAR), and Timescapes. All of these collections and their associated metadata have a digital presence in some form, but they are dispersed across an array of distinct online portals. It has been the intention of this project to work towards bringing these rich materials into greater dialogue with one another in pursuit of an interconnected collections environment.

Out of the myriad connections that could be drawn between these collections held by University of Leeds Libraries, this project has focused on the single strand of building connections between research publications and heritage objects. In operational terms, this has meant establishing bibliographic references as tangible links between WRRO and WREO on the one hand and Cultural Collections on the other. This work occurred at a time of major procedural change for Cultural Collections in particular. Its online collections catalogue was in the process of being overhauled as part of the transformative Digital Library Infrastructure Project (DLIP), a flagship initiative to maximise the digital potential of these invaluable cultural resources (University of Leeds Libraries, 2023). The move to a revised online system better equipped for connectivity has presented an ideal opportunity to build cross-platform integration into routine collections management workflows. The adoption of a new process is more likely to endure if it is fully supported from the outset.

It is also an opportune moment to pursue this objective in the broader occupational context, as there have been tentative moves to adopt cross-sector practices as a means of better mobilising digital platforms. GLAM institutions are starting to realise the possibilities afforded by purpose-built digital research repositories to house the diverse outputs from their investigations, encompassing exhibition texts as well as more traditional peer-reviewed publications (Rees Koerner and Ackrell, 2025). In the other direction, university heritage practitioners have adopted GLAM approaches to collections documentation as a model for systematising their own procedures and workflows in this area (Salse-Rovira et al., 2024). Despite the value of such initiatives, however, they still remain very much an exception within the wider field. Given their distinct disciplinary trajectories, the GLAM and academic research support sectors have largely pursued separate paths in their engagement with digital collections metadata. Very little appears so far to have been published on the theory or practice of linking repository holdings with archival and catalogue records as part of a wider online ecosystem, an omission that this project has sought to rectify.

In this emergent context, the 'collections-as-data' paradigm provides a useful approach to work towards bridging this procedural divide. Its core principles were

first set down in 2017 by the *Santa Barbara Statement on Collections as Data*, which exhorted cultural institutions to make their digital collections more amenable to computational analysis by reframing collections management processes as a form of data stewardship (Padilla et al., 2018). Although its provisions primarily address traditional GLAM collections, the prioritisation of technical interoperability between distinct digital infrastructures establishes the conceptual groundwork for their greater integration with associated research repositories. Conceptualising collections metadata and publications metadata as two facets of an agnostic cultural data environment therefore represents an important step in transcending their conventional disciplinary silos. This premise is intrinsic to the practical work of generating tangible connections across GLAMA collections hosted online.

Since the publication of the Santa Barbara Statement, the profound evolution of digital and cultural practices has required practitioners working at their intersection to adapt accordingly. These developments have been manifested in the collections-as-data sphere of practice, whose guiding mission was updated in 2023 with the publication of the revised *Vancouver Statement on Collections-as-Data* (Padilla et al., 2023). It built on the foundations established by its predecessor, while placing greater emphasis on the societal and ethical implications of the collections-as-data approach. Discussions of participatory design, social interoperability, sustainable infrastructure, climate impact, and exploitative labour were thus foregrounded to a much greater degree. In contrast, the main innovation of the Vancouver Statement from a technical standpoint was its final principle:

Collections-as-data stewards should design access with appropriate consideration of data consumption by artificial intelligence or other technologies. Collections as data may be used in training sets for artificial intelligence and product development. Stewards should be mindful of the ethical implications, including intellectual property and claims to data sovereignty, and should develop adequate safeguards against improper usage, detrimental loss of context, and the amplification of biases. (Padilla et al., 2023, p.4)

This point ties the closer integration of GLAMA collections back to the unifying theme of the report and a pressing concern for all stewards of digital collections at University of Leeds Libraries: the transformative impact of Generative AI.

It is against this backdrop that the project has explored the ability of these new tools to generate deeper connections between the cultural objects, archival records, and research outputs that constitute the digital collections ecosystem at University of Leeds Libraries. This exercise has been separated into three processes given the practical challenges involved in aligning multiple distinct software platforms:

1. Utilising Generative AI tools to locate references to cultural collections objects in published research outputs.
2. Extracting publications metadata from repository records in an interoperable format.
3. Compiling navigable bibliographic references in the associated digital object records.

In the course of working through these specific tasks, this project has sought to model a responsible approach to Generative AI that can speak to wider GLAMA practice. Provided that a critical awareness is maintained throughout its use, it could help to realise connections between cultural collections on an unprecedented scale. The technology is available; the question is how to use it effectively and responsibly.

### **Contextualising Connections: The Digital Collections Ecosystem at University of Leeds Libraries**

Before initiating the research process, its technological basis had to be established. As outlined in the introduction, interactive chatbots are the visible manifestation of the mainstream adoption of Generative AI. Out of this crowded field, Microsoft Copilot and Anthropic Claude were ultimately chosen as the primary objects of study. The reason for selecting these two options was simple, these were the only two chatbots that were explicitly cleared for use by the University of Leeds at the time of the project. From an ethical perspective, it was essential to conform to institutional guidelines around the responsible use of Generative AI as a research tool (Knowles, 2025, p.3). There was also a more practical consideration. For this new process to be adopted, University of Leeds Libraries personnel must be able to access the necessary software. Copilot is more practical in this respect as all University of Leeds staff can access its secure chat functionality as part of the Microsoft 365 enterprise subscription, whereas Claude has to be approved for official use on an individual basis. It was still worth comparing their performance to better assess the utility of Generative AI overall rather than any single application in particular.

The next matter to consider is the reason for utilising Generative AI over other AI technologies. AI-driven literature searching tools have been developed, for example, including platforms like Dimensions AI and Research Rabbit that are also available to University of Leeds staff. The advantage of the Generative AI chatbots is their vast reserve of training data, specifically the assumption that their underlying LLMs have been produced through the systematic harvesting of full-text records. Access to document text is central to this prospective effort, as it is often the sole location of bibliographic references. This is a feasible prospect in the White Rose repositories, as it is their fundamental purpose to 'provide open access to full-text research

outputs' (White Rose Research Online, no date). Of course, the realities of a user-led deposit process may mean that not all available documents have been correctly processed with Optical Character Recognition software that produces searchable content. Even when applying Generative AI tools to these holdings, there is always a chance that some items will be missed. It may not be a flawless process then, but neither is the laborious task of manually searching for bibliographic references.

The basis of these connections should already exist in the form of academic references within published outputs. For the purposes of research integrity and reproducibility, cultural collections are subject to the same referencing requirements as any other source material. Consequently, the Harvard, APA, Chicago, IEEE, MHRA, MLA, and Vancouver referencing systems all contain guidance for citing cultural collections objects in some form – commonly divided into works of art and archival manuscripts (Pears and Shields, 2025, pp.viii-xxi). Of course, this ideal is unlikely to have been realised consistently in practice as the form, location, and content of attribution practices vary according to the individual circumstances. House styles and personal preferences can produce quite distinct references to a single object. There is even disparity in the very nature of the citation process itself. Cultural collections often appear as visual images rather than textual references in research outputs, so their details may appear in associated captions or lists of figures instead of footnotes or bibliographies.

In spite of these substantial variations, however, there are certain basic descriptors that will be common to a large proportion of these references. There is the name of the object itself, which generally operates as its primary referent. There will also likely be some reference to a host entity, whether that is a specific named collection or an institutional owner (preferably both). Finally, unique identifiers associated with a particular object may be included in the form of accession numbers, archival shelfmarks, URLs, Uniform Resource Identifiers (URIs), or a combination of them. In conjunction, these metadata could be harnessed to establish connections between the source collections and the resulting research outputs, provided that the right search strategies are formulated.

As a test case for this study, it was necessary to identify a collection held in the Cultural Collections at the University of Leeds Libraries that was already cited regularly in existing research publications. The John Bedford trade card collection was first considered as a means of linking the two fellowships, but it had to be ruled out because it was not the subject of enough academic studies held in the White Rose repositories. Instead, the Leeds Philosophical and Literary Society (LPLS) collection was selected as the trial example due to its discrete nature and its frequent

citation in published outputs. As a benchmark for this investigation, it was necessary to establish a broad estimate for the number of existing citations by performing a basic Google search for publications in WRRO and WREO that referenced LPLS verbatim ("[Leeds Philosophical and Literary Society](https://www.leeds.ac.uk/philosophical-and-literary-society)" site:whiterose.ac.uk). This returned 49 unique results (see Table 1, Appendix II), which would appear a reasonable total on first inspection. However, this picture was complicated by the fact that this included a substantial proportion of false positives. Only 20 of these publications (or 41 percent) actually refer to the LPLS collections held by Cultural Collections at University of Leeds Libraries. There were a few instances where the Society was mentioned without its records being cited, but most of the remaining references were to the published *Proceedings* of the LPLS. According to the wider Library schema, these have been classified as printed items that belong in the standard library stacks and are thus maintained in a distinct catalogue to the LPLS holdings in Cultural Collections. Where cohesive collections are concerned, the dispersal of associated GLAMA materials across different disciplinary systems can seem rather arbitrary in practice. Overall, this sample provided a general baseline to measure the effectiveness of the Generative AI tools in navigating the frequent intricacies involved in referencing cultural collections.

### **Identifying Connections: Prompt Engineering to Locate Cultural Collections in Research Outputs**

The initial approach sought to harness Copilot and Claude as search tools, directly inputting collections parameters as text prompts. In line with the critical approach of the fellowship, these were designed to conform to the principles advanced by the CLEAR Framework for Prompt Engineering – concise, logical, explicit, adaptive, and reflective (Lo, 2023). The full prompts and responses for this exploration are listed in Table 2 (Appendix II). Prompt 1 represented a starting point for this search process that incorporated all of the main subjects:

Compile a list of research publications that reference the Leeds Philosophical and Literary Society archival records held by University of Leeds Libraries. Only include publications that are held in the White Rose Research Online or White Rose Etheses Online repositories.

This input resulted in what could be termed a qualified success. Both Copilot and Claude correctly identified a single thesis in WREO that utilised LPLS records, Mark Steadman's institutional history of its scientific collections published in 2019. Both tools provided a useful summary of this single source, although Claude did provide more detail. However, the fact that only one publication was returned out of a potential total of nearly fifty was not an ideal outcome.

Prompt 2 therefore sought to expand the results by specifying that ‘an exhaustive list’ of relevant citations should be generated. Yet this did not prove any more effective. Both tools continued to present Steadman’s thesis as the only research output that fitted the search criteria, contrary to the results of the original benchmark (see Table 1). Copilot’s explanation of this outcome was limited to a short list of online sources, whereas Claude provided an overview of its search methodology in addition to a larger source list. In this respect, it better displayed the tenets of an Explainable AI approach even if its overall success was limited (Tóth et al., 2025). But alongside this useful explanation of its workings, Claude also shared an erroneous suggestion that the Cultural Collections team maintain a definitive catalogue of publications citing their holdings. If this were truly the case, there would be little need for this research study.

Prompt 2 also harnessed the ability of Generative AI tools to restructure information. It aimed to format the outputs in line with established bibliographic referencing standards, streamlining the overall workflow by integrating the search and citation processes into one prompt. Claude was more accurate than Copilot in this respect, recognising that a thesis title should be placed in inverted commas rather than italics according to the adopted convention (Modern Humanities Research Association, 2024, pp.81-82). The MHRA referencing style was chosen for this purpose because it is already an established standard at the University of Leeds and it contains the core metadata for incorporation into the Linked Art data model (see the ‘Sharing Collections’ section below). If this process is to operate smoothly in practice, the importance of maintaining its overall simplicity cannot be overstated.

Prompts 3, 4, and 5 tried a number of variations on this theme as way of expanding the pool of returned publications. Prompt 3 broadened the prompt subject to encompass LPLS records in general, while the following prompts widened the relation type of the publications first to be ‘about’ LPLS (Prompt 4) and then to just ‘mention’ LPLS (Project 5). But again, the successive expansion of the search parameters did not make a difference. Each time, both Copilot and Claude were only able to identify the Steadman thesis as fulfilling the search criteria. While it was undeniably the most relevant result, the original Google benchmark had already established that it was far from the only one. After five different permutations of this text prompt had produced little change, there was good reason to pursue a slightly different course. As such, Prompt 6 was formulated to identify references to an individual item within the LPLS collections that was cited in numerous publications in the White Rose repositories. Far from its greater specificity enhancing the search process, this prompt did not produce any results at all in Copilot or Claude. Their effectiveness at locating bibliographic references unsupported was ultimately limited.

From this round of testing, it soon became clear that Generative AI tools are not yet sophisticated enough to replace traditional search engines outright as a means of locating references to cultural collections. It is harder to ascertain the reasons behind this disparity. One possibility is incomplete data processing. It is difficult to know the extent to which the White Rose repositories and the individual publications held therein have been harvested by proprietary LLMs that conceal their training models for commercial advantage (Jaillant et al., 2025b). It seems improbable given the scale of current LLMs, but certain documents may have been missed. Another explanation is a limited effectiveness in data retrieval, as these tools may not be able to filter the relevant information from their vast knowledge banks. But again, this is difficult to determine when only limited information is shared about the full resources at their disposal. There is also a third potential issue, namely that the search strategies adopted by the Generative AI tools were too narrow in scope and thereby filtered out other publications that may have been relevant. Although Claude did outline general search methodologies for Prompts 2 through 6, neither application provided enough detail to fully replicate their parameters so as to confirm that this was the case. Whatever the cause for their limited reach, the utility of Generative AI tools currently lies elsewhere.

The limited effectiveness of Copilot and Claude as investigative tools engendered the pursuit of a new approach. Instead of using Generative AI to perform searches, it could help to build more effective searches. Not only would this avoid its factual and training limitations when generating information, but it would be able to harness the functionality of mature search engine platforms rather than competing with them. Given the efficacy of Google at producing the original reference benchmark, the outputs were configured with its Boolean functionality in mind. Prompt 7 therefore represented an attempt at engineering a more effective search strategy:

Create a Boolean search to identify references to the Leeds Philosophical and Literary Society archival records within research publications held at the whiterose.ac.uk domain.

The full results of this prompt are this time listed in Table 3 (Appendix II), which proved a much more substantial proposition from the outset. While Copilot stuck to the brief in producing a viable search string and a summary of its constituent parts, Claude generated no less than four variant options for locating LPLS archival holdings. All that remained was to test their overall effectiveness in practice. As the initial prompt had specified the use of Boolean operators, this was as simple as copying each output in turn into Google and running the searches from there. For comparison, the full list of publications returned by these generated search strings is set out in Table 1 alongside the original benchmark.

Even when limited to only six queries, the results varied a great deal in their coverage. Claude's primary and variant 1 strings were the most circumscribed in this respect, as they only located a single relevant publication each. Interestingly, in both cases this was the same Steadman thesis that was repeatedly returned by the direct Generative AI search attempts (see Table 2), lending further weight to the suggestion that their strategies were overly narrow in scope. But this work at least did meet the desired criteria, further reinforced by its unique status as the only publication identified by all of the searches as referencing the LPLS archival collections. Claude's Search Variation 2 string produced a wider pool of 16 results, but it also reintroduced the problem of false positives. Despite the inclusion of an additional clause for terms related to historical sources, only 6 out of its 16 total publications (38 percent) cited the LPLS collections held in the Cultural Collections rather than its published proceedings. The third and final search variation suggested by Claude followed a similar pattern, but its results were more extensive in both breadth and depth. It located 37 publications, out of which 15 cited the LPLS materials held by Cultural Collections (41 percent). Its institutional focus and looser nomenclature were clearly more effective than the prioritisation of record types adopted by Variation 2. In a rather counterintuitive outcome, the lowest priority option turned out to be nearest the mark.

While Claude's response to the prompt was characterised by greater variety, the sole search query produced by Copilot actually turned out to be the most effective one. Not only did it find the highest total of relevant publications from the Generative AI strings (17 out of 40), but it also produced the greatest hit rate out of all the searches including the original benchmark query (43 percent versus 41 percent). It therefore struck the best balance between ubiquity and specificity. However, this can only be seen as a qualified success. While Copilot's effort was marginally more accurate than the initial search, it did not identify as many relevant publications outright as it fell short of the latter's total of 20. In this case, the difference between the two approaches came down to a minor trade-off between precision and reach. All things considered then, Copilot generated the most effective search strategy for the LPLS archival citations but not to any meaningful extent.

Given the inconclusive nature of these results, it is important to consider their wider implications for the viability of Generative AI as a search builder. If the raw figures are considered in isolation, then the application of tools like Copilot and Claude would hardly be worth the additional effort and resources. None of their search queries markedly improved on the results of the original Boolean string and a substantial proportion of them performed much worse. With a maximum retrieval rate

of only 43 percent, it could be argued that the entire premise is flawed and the process of verifying outputs would be too laborious to contemplate it becoming a routine procedure. While this can primarily be ascribed to the separation of the LPLS records into discrete printed and archival holdings, it is far from the only example where disciplinary divisions have engendered the dispersal of GLAMA collections (Jones, 2022, pp.6-7). If Generative AI tools are to function as effective search builders, they will have to accommodate the endless nuances of object classification systems. After all, the complex historical trajectories of cultural collections have rarely produced simple administrative arrangements in the present.

In spite of this limited success, there are compelling reasons to persist with this approach. The analysis above only represented a first attempt at using AI tools to generate search strategies for locating cultural collections references in publications. The brevity of this research fellowship has precluded any further investigation, but there is clearly scope for improvement in certain key areas. An obvious next step would be the targeted refinement of the search parameters through systematic prompt engineering. The labour of manually verifying the individual publications for each Boolean query made it impractical to repeat the process within the project timeframe – a moot point when the direct searches performed by Generative AI repeatedly returned only one result. Following an informed process of iterative development, it may be possible to improve the reliability of the generated prompts in discerning between the respective LPLS holdings maintained by Cultural Collections and the wider Library, for example. Although the results of trial and error can hardly be predicted by their very nature, this approach could hold real potential for the greater integration of GLAMA collections with continued perseverance.

Perhaps the most favourable characteristic of Generative AI as a search builder was its accessibility. From the outset, its generation of five variant search strings was certainly more efficient and user friendly than if the process had been performed manually. This capability was then enhanced by its clear embodiment of Explainable AI principles. The outputs in Table 3 clearly demonstrate the genuine effort that both Copilot and especially Claude put into explaining the rationale behind their generated search strategies. Between them, they outlined in great detail the contribution of individual components, terms, and operators to the final queries. In the first instance, this information constitutes a solid starting point for further refinement. By showcasing possible ways to modify these specified variables, they offer a blueprint for additional stages of prompt engineering that could improve the effectiveness of its search functionality.

Moreover, this relative transparency has also revealed the unexpected potential of Generative AI as a learning tool. From their outputs alone, it may be possible to acquire a rudimentary working knowledge of search optimisation. While Prompt 7 did presuppose knowledge of the Boolean concept, the Generative AI applications were able to build targeted search queries without any verbatim use of its operators. Not only could this approach allow a newcomer to the field to formulate sophisticated searches with little preparation, but the accompanying statement of the underlying principles would also provide a basis for further instruction. This could represent a serendipitous opportunity for professional development. While many GLAMA practitioners will likely be aware of Boolean operators, it would be a mistake to assume that this knowledge is universal. The clear directions produced by these Generative AI tools, Claude in particular, could help the wider sector to better harness this powerful digital functionality as a means of building interdisciplinary connections. It is perhaps in this respect then that they have best embodied the model of Explainable AI. When the explanatory notes are comprehensive enough to effectively teach a new syntax from scratch, the pursuit of greater openness in Generative AI applications remains a viable prospect.

### **Structuring Connections: Generative AI as a Metadata Conversion Tool**

A major drawback of changing the role of Generative AI from search tool to search builder is that exporting references in a consistent bibliographic format has to be undertaken as a separate process. Prompt 8 represented an attempt to harness the generated Boolean searches directly to compile a list of formatted citations. However, this encountered the same problem as the abortive efforts to use Generative AI as a search engine (see Table 4). Copilot only identified two unique sources from its Boolean search, while Claude reverted to its sole recognition of the Steadman thesis even when the most effective Variation 3 string was used. As before, both tools did generate accurate references for the publications they were able to find with Claude slightly outpacing Copilot in this regard. But the formatting ability of Generative AI tools is largely a moot point if they cannot access the relevant references in the first place.

Seeking an alternative method of converting this information into a usable format proved a challenge. While it is possible to use the Google search results to generate bibliographic references, it is not straightforward and produces mixed results at best. Once a search has been run, the resulting page can be saved locally as a 'Web Page, Complete' file. The resulting html document produced by this approach can then be uploaded to a generative AI tool as a means of extracting references from

the search results contained therein. Prompt 9 represented an attempt to implement this in practice:

Format all of the individual entries in this document using the MHRA (4th edition) referencing style: "Leeds Philosophical and Literary Society" site\_whiterose.ac.uk - Google Search.html

However, only Copilot generated a successful output in response to this prompt. When the same operation was tried in Claude, it generated an error message specifying that the text contained in the html file was '1900% over the length limit' of its free version. The relaxation of commercial interest only extends so far.

With a little further prompting, Copilot was at least able to generate a full list of bibliographic references from the Google search (see Table 5, Appendix II). The results cannot be faulted for their scope or consistency, as all the journal articles and theses were respectively formatted according to methodical patterns. Instead, their main limitation was accuracy in both form and content. Once again, Copilot used italics for thesis titles rather than placing them in inverted commas as is prescribed by current MHRA convention. But perhaps more concerning from a cataloguing perspective was the number of metadata discrepancies: file names were mistakenly used as the output title in certain cases (see numbers 4, 11, 24, 27, and 49 in Table 5, for example); WRRO was listed as the academic journal for any identified articles (see references 2, 4, 5, 14, and 31); and the referenced URL usually resolved to the document itself rather than the repository record. It may have been possible to correct these outputs with further prompt engineering, but this would likely have required considerable effort for only limited payoff. Either way, the level of manual intervention required to perform the conversion process with Generative AI is arguably too laborious to be feasible in practice. In many respects, it would be easier to manually copy publications metadata from the White Rose repositories into the Cultural Collections catalogue to ensure a higher standard of accuracy. It can hardly be described as a streamlined process in its current state.

Overall, the use of Generative AI as a means of generating consistent references to cultural objects is currently an ambivalent proposition. There are certain stages of the process where it undoubtedly excels. It is highly capable at following established rules, for example, whether these take the form of a bibliographic referencing system or a Boolean search query. Its accessibility and effectiveness as a search builder in particular could hold great promise for identifying connections across the digital GLAMA collections ecosystem. But there is a substantial difference between a method that is possible and one that is feasible. A lot of work would ultimately need to be done to make the whole exercise viable as a routine workflow for Cultural Collections staff. At present, human input is realistically still required to verify the

accuracy of both the search results and the formatted references generated by AI tools. This is no mere formality, as high-quality metadata provides the bedrock for digital collections engagement. Performing searches at the collections level also raises the added step of matching bibliographic references to the correct items within wider archival holdings. Even with the aid of generative AI, this is still a considerable undertaking and would require further streamlining before institutional adoption. While Copilot did extend an intriguing offer to automate its generated search query (see Table 3, Prompt 7), this would not address the root cause of this issue. For the systematic retrieval of cultural collections references to work efficiently in practice, either the search functionality of generative AI tools or their extraction of publications metadata will require fundamental improvement. Perhaps with time, they will become powerful enough to perform the complex constituent processes to the rigorous standards expected of GLAMA practitioners.

### **Sharing Connections: Research Citations as Linked Open Data**

Although the process of identifying cultural collections in research publications currently leaves much to be desired, it is still worth exploring how these references can be pulled back into an online catalogue to embed the underlying connections. This section therefore addresses the third core objective of this project, establishing a coherent digital infrastructure to effectively codify and convey publications metadata. This investigation was soon pulled into the orbit of the wider DLIP workstreams at University of Leeds Libraries in their ongoing effort to overhaul the Cultural Collections catalogue. This transformation in digital practice offered a practical opportunity to build the necessary functionality into a new collections website from the start. While it was possible to record associated bibliographic works within the existing EMu collections management system, this was only visible internally and so was seldom utilised by Cultural Collections staff. With the introduction of a more intuitive and accessible platform, there may be greater appetite to foreground connections between GLAMA collections.

Identifying this existing gap in provision was a relatively straightforward exercise, but implementing a viable solution in response required much greater thought. Following the adoption of Linked Art by the DLIP team as the basis for a new Leeds Data Model (Abel, 2024), this fellowship sought to express the resulting bibliographic references in line with Linked Art principles as a means of better ensuring their compatibility with any future system. The underlying premise of this collective endeavour is to 'create a shared Model based on Linked Open Usable Data to describe cultural heritage' (Linked Art, 2025). The creation of navigable links that bridge different digital collections systems neatly aligned with this ongoing work. The

first stage of putting this into practice was to conceptualise how bibliographic references would fit within the wider model. In theory, it would be possible to embed each publication and its accompanying metadata as a full entity within the provisional Leeds Data Model. In the context of this project, however, this was deemed to be unnecessary. From an operational perspective, it would be more practical to harness the content of existing repositories like WRRO and WREO rather than going through the laborious process of duplication. As the Getty has adopted the Linked Art model for its online collections catalogue (Getty, 2025), the inclusion of an integrated bibliography field in its individual object records has offered a valuable precedent for this approach. This project therefore sought to embed bibliographic references as hyperlinks in the Cultural Collections object records that resolve to the relevant White Rose publications.

All that remained was the small matter of building this functionality into the emerging digital infrastructure that would serve to underpin the new Cultural Collections catalogue. The Linked Art model and its adaptation in the form of the Leeds Data Model are both based on the JSON data-transformation standard, specifically its linked data variant JSON-LD. Its hierarchical structure requires external bibliographic references to be formatted as subsidiary attributes of the original entity. Appendix III showcases multiple examples of sample code that illustrate this point, in each case the entire reference is encompassed by the overarching 'referred\_to\_by' container. A detailed breakdown of the generic template and its constituent elements has already been published elsewhere (Bowes, 2025), but it is important to discuss its relationship to the wider process. For a given reference type, only five fields should change between different references: the unique reference identifier, the formatted citation, the hyperlink URL, the unique sequence identifier, and the numerical position. Two of these metadata entries are generated by the AI-assisted search process, the formatted citation and the hyperlink URL. Subject to any minor alterations required to integrate it into the Leeds Data Model, it should be possible to input these details directly into any future collections management system.

This process is complicated by the fact that different publication types require distinct referencing formats by longstanding convention. While it might be feasible to code a single standard template from a technical perspective, making no distinctions between published works could lead to unforeseen documentation issues in future. Instead, this issue has been addressed by compiling multiple JSON templates for their respective configurations. Appendix III provides a comparison between journal articles and theses, as two of the most common record types held in the White Rose repositories. It is true that the code snippets are for the most part identical, but the few attendant changes are significant. The 'content' field is the main point of

departure (Line 10 in each of the examples), as this contains the citation outline for the distinct outputs. But the adjacent ‘\_label’ entry (Line 9) also distinguishes these blueprints through its provision of a human-readable description for the publication type within the code itself. Minor alterations can have substantial ramifications for cultural collections documentation. Moreover, it would not be overly difficult to create new reference templates from these existing examples. It would entail extracting the basic citation structure from the MHRA style guide (Modern Humanities Research Association, 2024), entering this in the ‘content’ field, and changing the associated ‘\_label’ entry to the new reference type. The capacity to accommodate a growing variety in research outputs should better ensure the long-term viability of this system.

Overall, this final phase in the generation of connections between research publications and cultural collections was the easiest to reconcile with operational realities. The fellowship’s opportune coexistence with the ongoing work of DLIP at University of Leeds Libraries was instrumental in this respect. Its adoption of a Linked Art methodology provided clear parameters for the integration of academic references into any resulting digital collections catalogue. Embedding bibliographic functionality within the Leeds Data Model should therefore provide a stable endpoint for all publications metadata, whether these are located by Generative AI tools or not. Building relevant fields into the new Cultural Collections system during its early development should mean the infrastructure is already in place if the search process is streamlined in due course. Better to anticipate possible innovation now than to miss future opportunities for metadata enhancement. This approach also offers real potential for scalability. While this study focused on fostering links with the WRRO and WREO repositories, any published digital output could conceivably be mapped onto the existing JSON templates with only a few minor alterations. The versatility of the Linked Art model is a major asset in the pursuit of greater collections engagement. Ultimately, the overhauled Cultural Collections website could act as a focal point of convergence in both the University of Leeds digital collections ecosystem and the wider GLAMA landscape.

## Future Directions for Generative AI in the Cultural Collections Field

Before summarising the overall findings, it must be recognised that the scope of these research fellowships was necessarily limited by their short duration. To devise, develop, and carry out a project, as well as produce useful outputs, in six to eight weeks is challenging. There was scope in both projects to pursue further analysis and carry them through to greater fulfilment. In the case of the trade cards mapping project, the functionalities of the software available in the timeframe was limited, while analytical implementation of Generative AI was suggestive, exploratory, and by no means exhaustive. Likewise, it was only possible to glimpse the potential of Generative AI tools as a means of building sophisticated searches for cultural collections references. If there had been more time to pursue systematic prompt engineering, for example, the overall accuracy of the resulting outputs could have been improved. Nonetheless, we are satisfied that it was possible to engage in creative, exploratory, and independent research within the scope of the fellowship that can offer suggestions about the future direction and process of critical engagement with Generative AI at the University of Leeds.

Moreover, it has not been possible within the scope of these fellowships to fully problematise the extractive costs of Generative AI, in terms of natural resources, labour, and equity; time was again a major limiting factor in this area. The targeted nature of the projects precluded further discussion of their positionality within the wider landscape of Generative AI, so it is fortunate that many of these urgent issues have already been explored in depth elsewhere (Crawford, 2021). We recognise these conceptual limitations and we hope that sustained long-term work reckoning with this complexity will be supported by Cultural Collections, the wider Library, and the University as a whole. For the purposes of these projects, we are satisfied that the relatively minimal computing power coupled with the deployment of tools already supported internally by the University has ensured that the resulting contributions have been sufficient to justify the resources used.

Even with these caveats in mind, it has been possible to determine a substantial amount from our exploration of Generative AI as a means of enhancing engagement with cultural collections. The resulting conclusions can be divided into two main categories. The first set pertains to the effective and innovative use of Generative AI tools in a cultural research context.

- **Utilise Generative AI strategically:** The first principal observation is that Generative AI is not infallible, no matter how sleek its front-end interface may appear. It cannot perform all tasks to the same ability, so it is important to recognise its strengths and weaknesses as a digital aid. For example, these

projects have shown in different ways that it thrives on order and structure. Whether converting trade card metadata into an intelligible form or constructing Boolean search strings, Generative AI is often highly effective at following specified rules. This is a valuable trait in the regulated field of cultural collections management. Building research projects that seek to leverage its technical capabilities from the outset will help to foster its proportionate use going forward.

- **Select the appropriate tools for the task at hand:** Once the basic suitability of Generative AI has been established, it is then important to choose the right tools to pursue the stated objectives. There was certainly no shortage of options at the time of writing. Copilot was an obvious choice for both projects as a gateway application that required little technical experience and had already been approved for secure institutional use. The other software packages were then adopted for more specialist purposes, Felt for spatial collections mapping and Claude for comparative search optimisation. It is worth taking time over this decision, as it will have a major impact on the resulting outcomes. Especially as a range of conceptual and practical considerations will need to be reconciled during the selection process.
- **Embrace the potential offered by experimentation with Generative AI tools:** The conclusions developed by this report have been produced through repeated engagement and experimentation with Generative AI tools. Neither author came into the project with a fixed idea of the best way to utilise their varied functionality to achieve our respective objectives. The successive stages of trial and error were crucial to the investigations, which gradually gained momentum as new approaches were pursued. AI prompts rarely produce perfect outputs right away, so it is helpful to view refinement as an integral part of the process. Effective use of Generative AI takes practice, but it is a skill that can open up new opportunities for collections access and cultural enrichment.
- **Harness the growing multimodal functionality of Generative AI:** With the increasing range and sophistication of Generative AI tools, the opportunities to pursue mixed media approaches are greater than ever. This research has sought to harness this technical versatility in a library context. The combined use of Copilot and Felt to generate an interactive map of the John Bedford Trade Card collection clearly highlighted the value of a multimodal approach to support new forms of cultural engagement. While the identification of cultural collections references was solely based on textual approaches by contrast, the incorporation of images into search strategies could enhance their effectiveness. Interactive chatbots and LLMs clearly have their uses, but they only represent the tip of the iceberg when it comes to Generative AI.

- **Thoroughly document all interactions with AI for research purposes:** Best practice in research ethics currently dictates that all engagement with AI should be documented thoroughly for full disclosure. As would be the case for any other cultural documentation procedure, capturing individual interactions with Generative AI established these projects on a sound methodological footing. Recording all the data associated with successive text prompts was a substantial task in of itself (see Appendix II, for example), but this information will be key to the study's future replicability. The form taken by this record-keeping is less important than the fact that it is done to a comprehensive and consistent standard. After all, the transparent use of AI is an essential precondition for robust and critical research into its future cultural applications.
- **Evaluate the merits of integrating AI functionality into wider digital systems:** One of the key challenges faced over the course of these fellowships has been the synthesis of distinct digital platforms. Copilot did struggle at times to process the trade card metadata underlying the Felt map (see Figures 6 and 7). Similarly, the act of converting Google searches into accurate bibliographic references for inclusion in the Linked Art model proved so convoluted as to be unworkable in practice. If these dislocations are to be overcome, then it may be worth pursuing the further integration of AI tools into routine systems. This would require a level of time, resources, and expertise beyond the scope of this research, but it could yield constructive results and streamline workflows with proper investment.
- **Explore the feasibility of open-source AI tools as the basis for more transparent processes:** One of the major criticisms levelled at the dominant Generative AI applications is that their inner workings are largely inscrutable. Due to a mixture of commercial competition and architectural complexity, they epitomise the technological impenetrability of the 'black box' concept. This fundamental issue was encountered during these fellowships, as it was not possible to interrogate the full generative process in either Copilot or Claude. One solution would be to prioritise the use of open-source AI tools that are transparent in their training and reasoning models. This may not be straightforward, given that they are less prominent and often have a steeper learning curve. But their adoption would better embody the University's core values of integrity, inclusivity, and collaboration in relation to Generative AI.

In comparison, the second group of proposals is more institutional in focus. The following recommendations and reflections thus correspond to the internal bureaucratic processes and logistical requirements of carrying out short-term research projects at the University of Leeds. They are, of course, indicative and not exhaustive, and reflect our experiences over the course of the projects. They are

intended to help encourage colleagues across University of Leeds Libraries to engage with Generative AI in their workflows and research.

- **Formulate a distinct process for evaluating the ethical use of AI in research projects:** We recommend the development of a specific ethics review process for research projects that incorporate Generative AI. While it is paramount that there is a robust and transparent process in place, the extant procedure better addresses ‘traditional’ projects that engage with personal data, confidential information, and sensitive themes. Neither project dealt with this sort of material, so substantial aspects of the review process were not applicable. It is also the case that both projects benefitted from a relatively swift timeline of approval; this is not, however, guaranteed, and could prevent the expediency of short-term projects in the future. Streamlining certain aspects of this process may also encourage more exploratory research initiatives in this area by demystifying the ethics process.
- **Develop practical guidance around the research approval process for AI tools:** We also recommend the development of templates and ‘how to’ guides to support University staff unfamiliar with research governance processes like ethical review and data management plans. We benefited from knowledge held within the project team of the institutional research infrastructure at the University of Leeds. But for prospective researchers with limited experience in negotiating these administrative systems, the complexity and often intimidating nature of such bureaucracy is a potential barrier to entry. Further clarification would help to facilitate the pursuit of future research efforts.
- **Encourage serendipitous engagement with Generative AI:** Across both projects we were struck by the clarity with which Generative AI, particularly Anthropic Claude, was able to explain its own logic and to ‘teach’ us about itself. Tutorials and drop-in sessions could capitalise on this to encourage staff across departments to engage in the exploratory and experimental nature of Generative AI in an attempt to bridge existing skills gaps and to facilitate an increased awareness of and familiarity with AI tools. Such sessions could include an introduction to the basics of prompt engineering and how to produce visual media. Practical experience is often an effective instructor.
- **Leverage available institutional resources for future research projects:** Future projects could be advertised and developed in relation to specific tools, software, and material that have been cleared specially for the purpose. In the case of both projects, delays were experienced while waiting for approval to use specific Generative AI platforms from the relevant internal departments. If it were possible to pre-approve, or at least expedite the software approval process, it would enhance the reflexivity of short-term projects like these ‘flash

fellowships'. Delivering a research fellowship is rarely a straightforward prospect, so every step forward contributes to its overall success.

- **Foster research communication and collaboration across University of Leeds Libraries:** We were grateful for the generous, insightful, and enthusiastic support of colleagues across the Library and beyond over the course of these fellowships. Sharing the project results with the wider professional community was the least we could do to repay this wholehearted generosity. Learning sessions, workshops, and collaborative events presenting research outcomes should continue to be promoted and integrated into the life of the Library. There is so much untapped research potential held there in terms of both content and personnel, not least in the explorative application of Generative AI within the GLAMA sector.

Overall, the University Cultural Collections and Generative AI research fellowship has been a rich experience. The opportunity to develop independent projects with full institutional backing on the cultural applications of these pervasive tools has offered meaningful scope for critical exploration. In their respective ways, the two constituent studies sought to realise the potential value of Generative AI tools in furthering the utility of digital collections. They achieved this to varying degrees of success in the event, but the investigative process was nevertheless instructive in both cases. Beyond the conclusions already outlined in this section, this critical approach has also imparted a pragmatic assessment of Generative AI shorn of the prevailing hyperbole. It is neither a saviour nor an enemy, 'just a powerful set of tools to support core activities that extend our imperfect, eminently human judgement' (Padilla, 2025, p.243). As such, Generative AI tools should be subject to the same measured scrutiny as any other system used to disseminate cultural collections. They should be judged on their own merits rather than preconceived notions of the wider field. Generative AI ultimately looks set to be an enduring feature of the digital landscape, so it is vital that cultural institutions are prepared to address its potential ramifications for collections engagement going forward.

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## Appendix I: Generative AI as Research Collaborator – Illustrations

Figure 1: Recto and verso of Mossman, Sons & Co trade card, engraved print on pasteboard, 92 x 60 mm. Reproduced with the permission of Cultural Collections and Galleries, University of Leeds Libraries, Bedford Collection, MS 2241/1/4/1/23

<<https://explore.library.leeds.ac.uk/special-collections-explore/718463>>

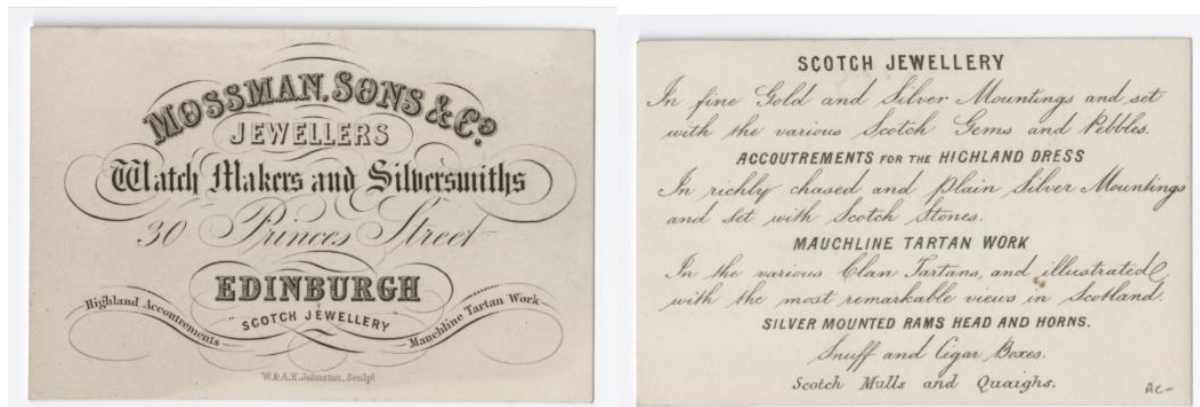


Figure 2: A. Durin trade card, chromolithograph on carte porcelaine, 140 x 102 mm. Reproduced with the permission of Cultural Collections and Galleries, University of Leeds Libraries, Bedford Collection, MS 2241/4/1/141

<<https://explore.library.leeds.ac.uk/special-collections-explore/718581%3E>>



Figure 3: Recto and moveable part of R. Jaekel trade card, chromolithograph on pasteboard, 95 x 150 mm. Reproduced with the permission of Cultural Collections and Galleries, University of Leeds Libraries, Bedford Collection, MS 2241/4/1/202 <<https://explore.library.leeds.ac.uk/special-collections-explore/718642>>



Figure 4: Excerpt from Felt trade card map, demonstrating street-level point plotting in London.



Figure 5: Summary of elements of the trade card collection as generated by Copilot.

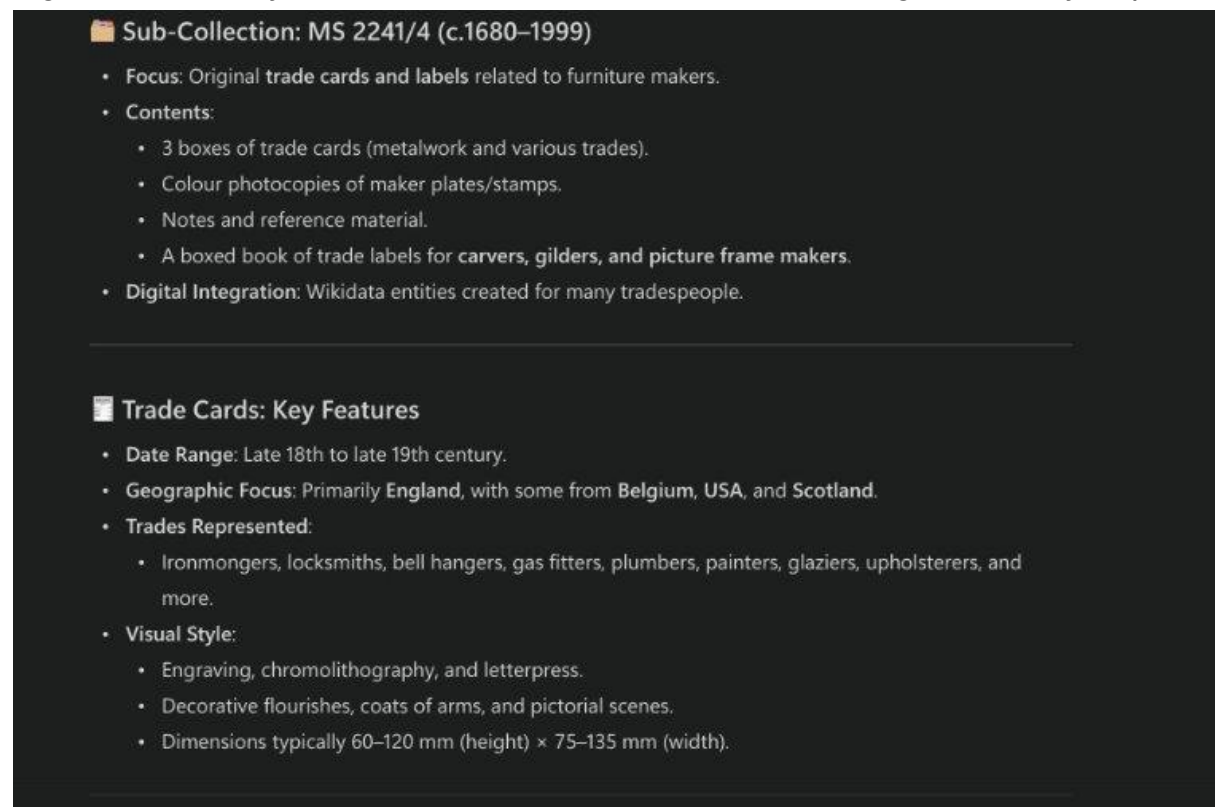


Figure 6: Graph plotting names of engravers and printers mentioned in the collection, as generated by Copilot.

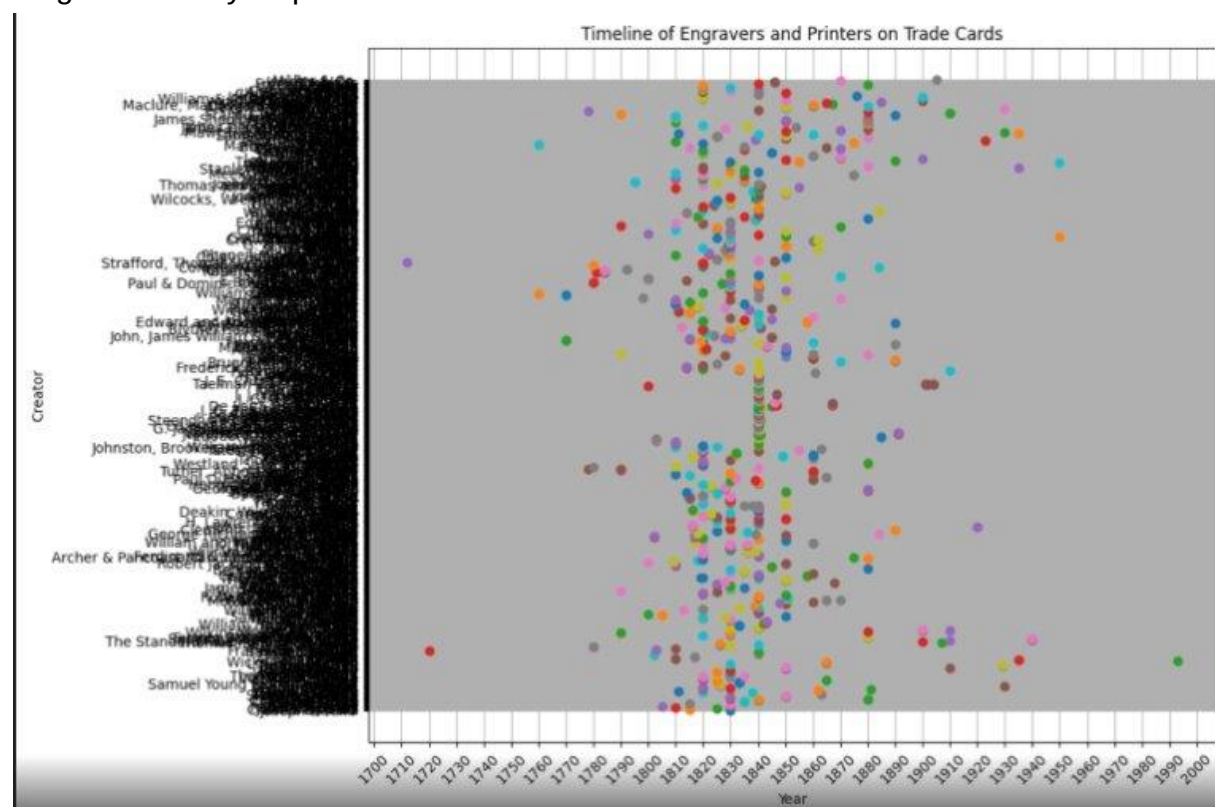


Figure 7: Graph plotting names of engravers and printers in Exeter mentioned in the collection, as generated by Copilot.

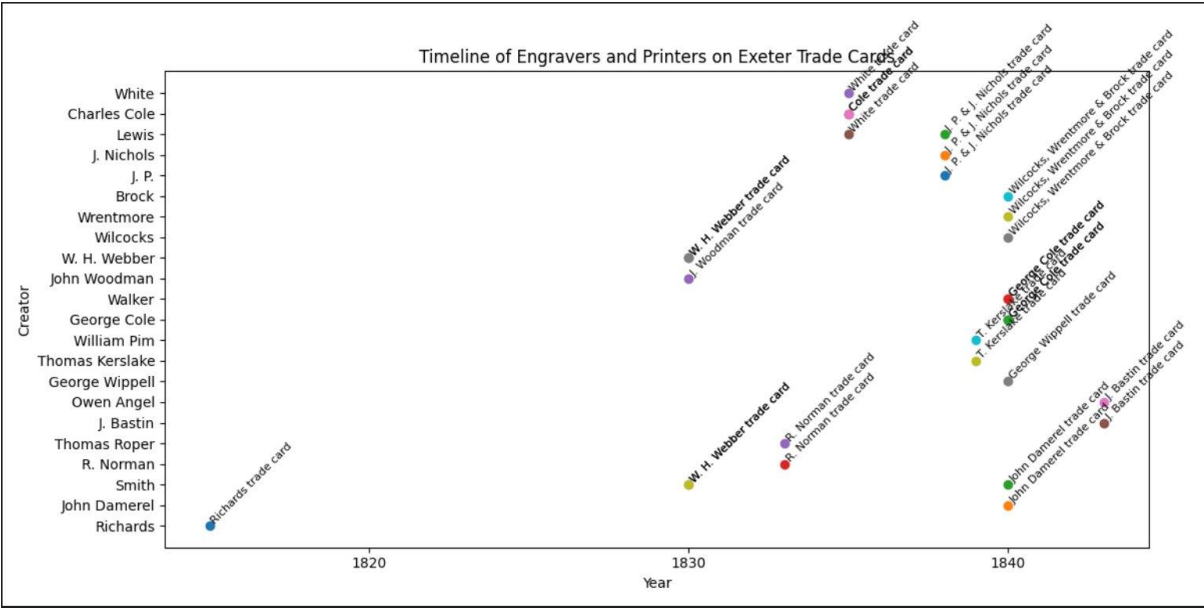


Figure 8: Graph plotting recurrence of iconographic motifs, as generated by Copilot.

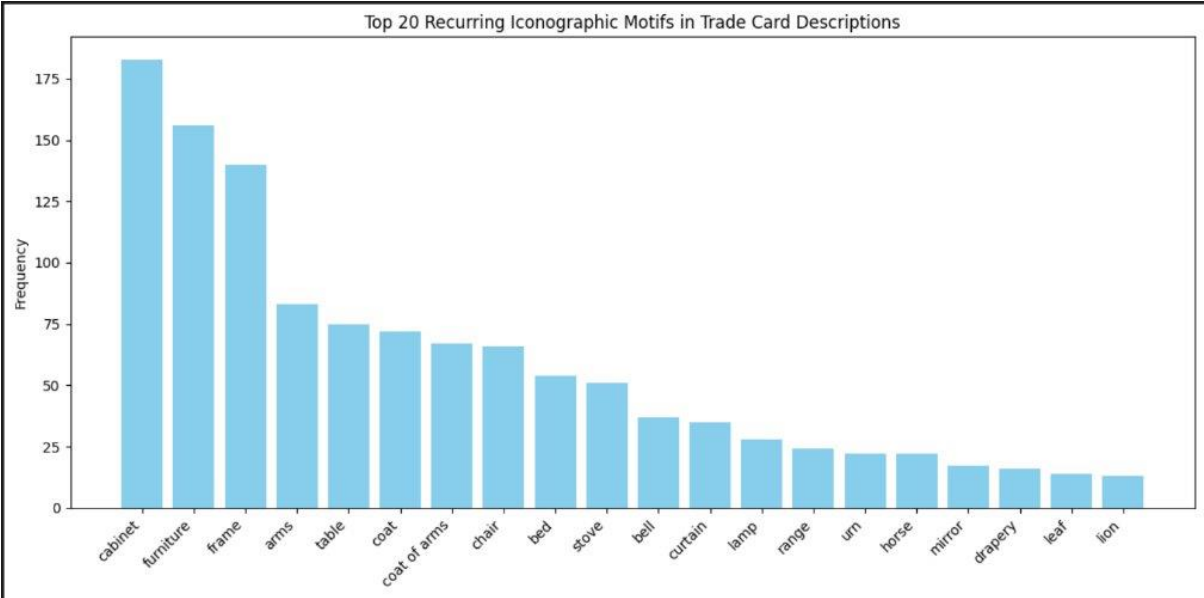


Figure 9: Graph comparing recurrences of iconographic motifs in Paris and Ghent, as generated by Copilot.

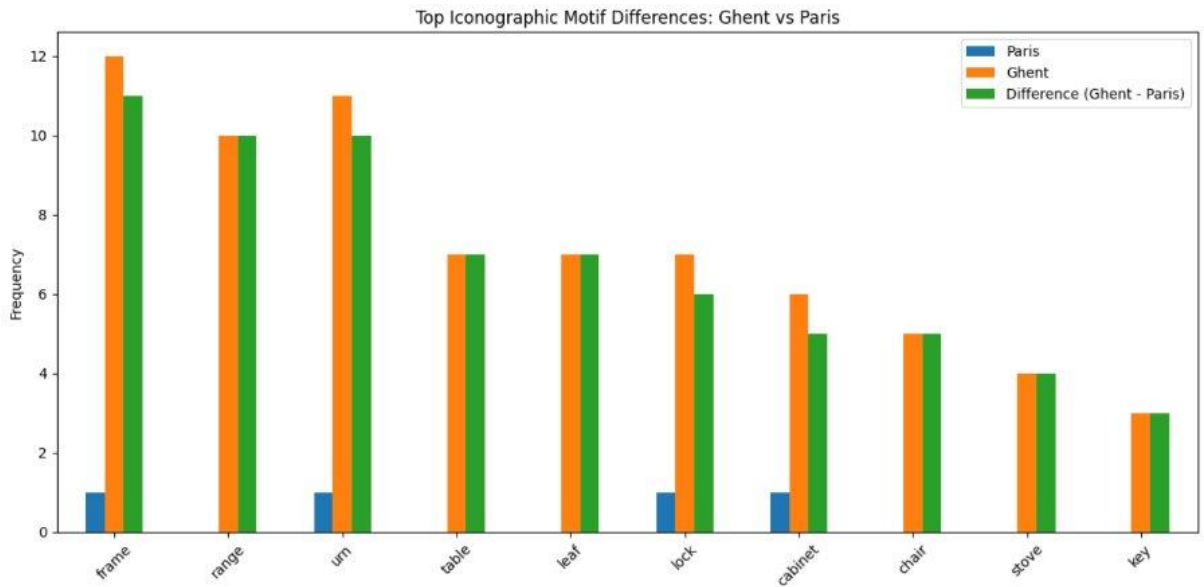


Figure 10: Spreadsheet highlighting trade cards in which a commodity with potential connections to global and colonial trade, as generated by Copilot.

|    | A                                                       | B                                                           | C                                                     | D                | E | F | G | H | I | J |
|----|---------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------|------------------|---|---|---|---|---|---|
|    | Title                                                   | Location                                                    | Description                                           | Matched Keywords |   |   |   |   |   |   |
| 1  | Bedford & Son trade card                                | Norwich, Norfolk, England, United Kingdom                   | Highly pict [tea, 'japan']                            |                  |   |   |   |   |   |   |
| 2  | William Holland trade card                              | Leek, Staffordshire, England, United Kingdom                | Highly pict [tea, 'coffee', tobacco, 'sugar']         |                  |   |   |   |   |   |   |
| 3  | Samuel Alexander trade card                             | Gloucester, Gloucestershire, England, United Kingdom        | Pictorial 15 [japan]                                  |                  |   |   |   |   |   |   |
| 4  | William Dobson trade card                               | London, United Kingdom                                      | Late 18th c [rum]                                     |                  |   |   |   |   |   |   |
| 5  | George Wipplert trade card                              | Exeter, Devon, England, United Kingdom, Europe              | Pictorial 15 [tea, 'coffee', 'rum', 'japan']          |                  |   |   |   |   |   |   |
| 6  | H. Westcott trade card                                  | Plymouth, Devon, England, United Kingdom, Europe            | Simple 19t [tea]                                      |                  |   |   |   |   |   |   |
| 7  | William Holland trade card                              | Hanley, Staffordshire, England, United Kingdom, Europe      | Highly pict [tea]                                     |                  |   |   |   |   |   |   |
| 8  | Taunton & Hutton trade card                             | Birmingham, West Midlands, England, United Kingdom          | Simple 19t [tea]                                      |                  |   |   |   |   |   |   |
| 9  | R. W. Winfield trade card                               | Birmingham, West Midlands, England, United Kingdom          | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 10 | Wren Brothers trade card                                | London, United Kingdom                                      | Simple 19t [tea]                                      |                  |   |   |   |   |   |   |
| 11 | Edward Phipson trade card (advertisement)               | Birmingham, West Midlands, England, United Kingdom          | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 12 | N. Hosking trade card (advertisement)                   | London, United Kingdom                                      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 13 | W. H. Thomas trade card                                 | London, United Kingdom                                      | Elaborate 1 [tea, 'japan']                            |                  |   |   |   |   |   |   |
| 14 | John Rigby & Son trade card                             | Manchester, Greater Manchester, England, United Kingdom     | Simple 19t [tea]                                      |                  |   |   |   |   |   |   |
| 15 | W. D. Parkhouse trade card                              | Triverton, Devon, England, United Kingdom                   | Highly pict [tea, 'rum', 'japan']                     |                  |   |   |   |   |   |   |
| 16 | John Hosking trade card                                 | Redruth, Cornwall, England, United Kingdom, Europe          | Pictorial 15 [tea, 'rum', 'japan']                    |                  |   |   |   |   |   |   |
| 17 | W. Carter trade card                                    | Royal Leamington Spa, Warwickshire, England, United Kingdom | Highly pict [japan]                                   |                  |   |   |   |   |   |   |
| 18 | D. Farrington trade card                                | Brighton, East Sussex, England, United Kingdom, Europe      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 19 | Levy, Joseph & Co. trade card                           | Bristol, England, United Kingdom, Europe                    | Pictorial 15 [foreign]                                |                  |   |   |   |   |   |   |
| 20 | James Walker trade card                                 | London, United Kingdom                                      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 21 | E. Eley trade card                                      | London, United Kingdom                                      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 22 | Robert Jackson & John Moser trade card                  | London, United Kingdom                                      | Simple late [japan]                                   |                  |   |   |   |   |   |   |
| 23 | James Robertson trade card                              | Edinburgh, Lothian, Scotland, United Kingdom                | Pictorial 15 [japan]                                  |                  |   |   |   |   |   |   |
| 24 | Taylor & Perry trade card                               | Birmingham, West Midlands, England, United Kingdom          | Highly pict [rum]                                     |                  |   |   |   |   |   |   |
| 25 | J. Strickland trade card                                | London, United Kingdom                                      | Simple 19t [japan]                                    |                  |   |   |   |   |   |   |
| 26 | W. & J. Walker trade card                               | Hull, East Yorkshire, England, United Kingdom               | Pictorial 15 [tea, 'japan']                           |                  |   |   |   |   |   |   |
| 27 | W. Plummer trade card                                   | Norwich, Norfolk, England, United Kingdom                   | Pictorial 15 [tea, 'coffee', 'japan']                 |                  |   |   |   |   |   |   |
| 28 | Lingham Brothers trade card                             | Worcester, Worcestershire, England, United Kingdom          | Simple 19t [japan]                                    |                  |   |   |   |   |   |   |
| 29 | C. Jeakes & Co. trade card (advertisement)              | London, United Kingdom                                      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 30 | J. H. Barlow trade card (advertisement)                 | London, United Kingdom                                      | Pictorial 15 [tea, 'coffee', 'rum']                   |                  |   |   |   |   |   |   |
| 31 | Deakin, Wilmshurst & Co. trade card                     | London, United Kingdom                                      | Simple 19t [tea, 'japan']                             |                  |   |   |   |   |   |   |
| 32 | George Cole trade card                                  | Exeter, Devon, England, United Kingdom, Europe              | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 33 | George Cole trade card                                  | Exeter, Devon, England, United Kingdom, Europe              | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 34 | J. M. Wood trade card                                   | Norwich, Norfolk, England, United Kingdom                   | Highly pict [japan]                                   |                  |   |   |   |   |   |   |
| 35 | William Dunn trade card                                 | London, United Kingdom                                      | Simple 19t [cotton]                                   |                  |   |   |   |   |   |   |
| 36 | Boucher & Guy trade card                                | London, United Kingdom                                      | Simple 19t [east india]                               |                  |   |   |   |   |   |   |
| 37 | W. R. Boucher trade card (label)                        | London, United Kingdom                                      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 38 | Brett trade card                                        | Portsea, Hampshire, England, United Kingdom, Europe         | Pictorial 15 [tea, 'japan']                           |                  |   |   |   |   |   |   |
| 39 | Warren Smith trade card                                 | London, United Kingdom                                      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 40 | Quarrell & Niner trade card                             | London, United Kingdom                                      | Highly pict [cotton]                                  |                  |   |   |   |   |   |   |
| 41 | William Plowman trade card (advertisement)              | Oxford, Oxfordshire, England, United Kingdom                | Elaborate 1 [tea, 'rum']                              |                  |   |   |   |   |   |   |
| 42 | Thomas Cafe trade card (advertisement)                  | London, United Kingdom                                      | Simple 19t [tea, 'coffee', 'sugar', 'rum', 'morocco'] |                  |   |   |   |   |   |   |
| 43 | Samuel Holmes trade card (advertisement)                | London, United Kingdom                                      | Pictorial 15 [tea]                                    |                  |   |   |   |   |   |   |
| 44 | J. Yoshizumi and R. Yamamura trade card (advertisement) | Osaka, Kansai, Japan, Asia                                  | Pictorial 15 [tea, 'silk', 'japan']                   |                  |   |   |   |   |   |   |
| 45 | A. Durin trade card                                     | Ghent, Flanders, Belgium, Europe                            | Highly pict [tea]                                     |                  |   |   |   |   |   |   |
| 46 | Van Hoey Frères & Soeur trade card                      | Brussels, Brussels Capital, Belgium, Europe                 | Pictorial 15 [silk, 'cotton']                         |                  |   |   |   |   |   |   |
| 47 | J. G. Plooy-Costermans trade card                       | Mechelen, Flanders, Belgium, Europe                         | Highly pict [tea]                                     |                  |   |   |   |   |   |   |
| 48 | John Corbett trade card (advertisement)                 | Carlisle, Cumbria, England, United Kingdom, Europe          | Simple 19t [tea]                                      |                  |   |   |   |   |   |   |
| 49 | Joshua Jowett trade card (advertisement)                | London, United Kingdom                                      | Simple 19t [japan]                                    |                  |   |   |   |   |   |   |
| 50 | Morris & Co. trade card (advertisement)                 | London, United Kingdom                                      | Simple 19t [rum]                                      |                  |   |   |   |   |   |   |
| 51 | Henry Heynes trade card                                 | Birmingham, West Midlands, England, United Kingdom          | Simple 19t [tea]                                      |                  |   |   |   |   |   |   |

Matched Keywords

Sort

Ascending Descending

By colour: None

Filter

By colour: None

Choose One

Search

☒ (Select All)

☒ ['africa']

☒ ['calico']

☒ ['cotton']

☒ ['east india']

☒ ['foreign', 'silk']

☒ ['foreign', 'tea', 'east']

☒ Auto Apply

Apply Filter Clear Filter

## Appendix II: Prompt Engineering – Iteratively Developing a Search Process for Cultural Collections

Table 1: Breakdown of Publications in WRRO and WREO Located by Different Search Strings

| Publication                                  | Basic Boolean String | Copilot String | Claude Primary String | Claude Variant String 1 | Claude Variant String 2 | Claude Variant String 3 |
|----------------------------------------------|----------------------|----------------|-----------------------|-------------------------|-------------------------|-------------------------|
| <a href="#">Alberti (2000)</a>               | x                    | x              |                       |                         | x                       | x                       |
| <a href="#">Andrews (2013)</a>               | x                    | x              |                       |                         | x                       | x                       |
| <a href="#">Boswell (1994)</a>               | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Bowd (2015)</a>                  | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Burton (2019)</a>                | x                    | x              |                       |                         | x                       | x                       |
| <a href="#">Cunningham (1979)</a>            | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Faithfull (2001)</a>             | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Grady (1980)</a>                 | x                    |                |                       |                         | x                       |                         |
| <a href="#">Hall (2022)</a>                  | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Holford (2001)</a>               | x                    | x              |                       |                         | x                       | x                       |
| <a href="#">Howard et al. (2020)</a>         | x                    |                |                       |                         |                         |                         |
| <a href="#">Keen (1990)</a>                  | x                    | x              |                       |                         |                         |                         |
| <a href="#">Lloyd (2005)</a>                 | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Morgan (2000)</a>                | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Murphy (2014)</a>                | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Poyer (2015)</a>                 | x                    |                |                       |                         |                         |                         |
| <a href="#">Radick &amp; Steadman (2021)</a> | x                    | x              |                       |                         |                         |                         |
| <a href="#">Reeve (2021)</a>                 | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Steadman (2019)</a>              | x                    | x              | x                     | x                       | x                       | x                       |
| <a href="#">Wade (2012)</a>                  | x                    | x              |                       |                         |                         | x                       |
| <b>False Positives</b>                       |                      |                |                       |                         |                         |                         |
| <a href="#">Baez Ruiz (2017)</a>             |                      |                |                       |                         |                         | x                       |
| <a href="#">Barbour-Mercer (1988)</a>        | x                    |                |                       |                         |                         |                         |
| <a href="#">Bijkerk (2014)</a>               | x                    |                |                       |                         | x                       |                         |
| <a href="#">Boswell (2003)</a>               | x                    |                |                       |                         | x                       |                         |
| <a href="#">Cambers (2003)</a>               | x                    | x              |                       |                         | x                       | x                       |
| <a href="#">Colton (2003)</a>                | x                    | x              |                       |                         | x                       | x                       |
| <a href="#">DeGroff (2012)</a>               | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Demaine (2000)</a>               | x                    | x              |                       |                         |                         | x                       |
| <a href="#">Ellis (2022)</a>                 | x                    |                |                       |                         |                         |                         |
| <a href="#">Euler (1995)</a>                 | x                    | x              |                       |                         |                         | x                       |

|                                      |   |   |  |  |   |   |
|--------------------------------------|---|---|--|--|---|---|
| <a href="#">Gent (2010)</a>          | x | x |  |  | x | x |
| <a href="#">Gilbert (2019)</a>       |   | x |  |  |   | x |
| <a href="#">Hopper (1999)</a>        | x | x |  |  |   |   |
| <a href="#">Iwama (2003)</a>         | x | x |  |  |   | x |
| <a href="#">Jensen (2019)</a>        | x | x |  |  |   | x |
| <a href="#">Jervis (2011)</a>        | x | x |  |  |   |   |
| <a href="#">Kettle (2023)</a>        | x | x |  |  |   | x |
| <a href="#">Little (2007)</a>        | x | x |  |  |   |   |
| <a href="#">Loud (2024)</a>          | x |   |  |  |   |   |
| <a href="#">Maddison (1986)</a>      | x | x |  |  |   | x |
| <a href="#">Maquire (2017)</a>       | x | x |  |  |   | x |
| <a href="#">Mateen (2016)</a>        |   |   |  |  | x |   |
| <a href="#">Merlo Perring (2010)</a> | x | x |  |  |   | x |
| <a href="#">Milestone (2009)</a>     | x | x |  |  | x | x |
| <a href="#">Owen (2015)</a>          | x | x |  |  |   | x |
| <a href="#">Reynolds (2017)</a>      | x | x |  |  | x | x |
| <a href="#">Short (1999)</a>         |   |   |  |  |   | x |
| <a href="#">Sims (1988)</a>          | x |   |  |  | x |   |
| <a href="#">Thornton (1999)</a>      | x | x |  |  |   | x |
| <a href="#">Throesch (2007)</a>      |   |   |  |  |   | x |
| <a href="#">Ward (2015)</a>          | x | x |  |  |   |   |
| <a href="#">Warren (2013)</a>        | x | x |  |  |   | x |
| <a href="#">Watson (2007)</a>        | x | x |  |  |   | x |
| <a href="#">Withrington (1991)</a>   | x |   |  |  | x |   |

Table 2: Generative AI as Search Tool

All searches were performed on 17 July 2025.

| Microsoft 365 Copilot Chat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Anthropic Claude (Sonnet 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prompt 1: <i>Compile a list of research publications that reference the Leeds Philosophical and Literary Society archival records held by University of Leeds Libraries. Only include publications that are held in the White Rose Research Online or White Rose Etheses Online repositories.</i>                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p>Here is a research publication that references the Leeds Philosophical and Literary Society archival records and is available in the White Rose eTheses Online repository:</p> <p>■ <b>Title:</b><br/> <b>A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City</b></p> <ul style="list-style-type: none"> <li>• <b>Author:</b> Mark Steadman</li> <li>• <b>Year:</b> 2019</li> <li>• <b>Institution:</b> University of Leeds</li> </ul> | <p>Based on my search of the White Rose Research Online and White Rose eTheses Online repositories, I have found the following research publication that references the Leeds Philosophical and Literary Society archival records held by the University of Leeds Libraries:</p> <p><b>Research Publications Referencing Leeds Philosophical and Literary Society Archives</b></p> <p><b>1. Steadman, Mark (2019)</b></p> <ul style="list-style-type: none"> <li>• <b>Title:</b> "A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, </li></ul> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• <b>Repository:</b> <a href="#">White Rose eTheses Online</a></li> <li>• <b>Abstract Summary:</b><br/>This PhD thesis explores the development and transformation of the Leeds Philosophical and Literary Society's museum from its founding in the early 19th century through to its transfer to Leeds Corporation in 1921. It draws extensively on previously unexamined archival material held by the University of Leeds Libraries.</li> </ul> <p>Would you like me to help locate more publications or explore related topics such as the Society's influence on museum culture or scientific education in Leeds?</p> | <p>Interpreting &amp; Presenting the Natural World in the English Industrial City"</p> <ul style="list-style-type: none"> <li>• <b>Type:</b> PhD thesis</li> <li>• <b>Institution:</b> University of Leeds</li> <li>• <b>Repository:</b> White Rose eTheses Online</li> <li>• <b>URL:</b> <a href="https://etheses.whiterose.ac.uk/25449/">https://etheses.whiterose.ac.uk/25449/</a></li> <li>• <b>Supervisors:</b> Greg Radick and Jon Topham</li> <li>• <b>Academic Unit:</b> School of Philosophy, Religion and the History of Science</li> <li>• <b>Abstract:</b> This thesis makes use of previously unexamined material connected to the Leeds Philosophical and Literary Society, its purpose-built Philosophical Hall, and the operation of the museum therein, offering an expansive analysis of an important nineteenth-century museum, its parent philosophical society, and their ever changing relationship with a growing industrial township and the emerging natural sciences.</li> </ul> <p>This thesis specifically utilizes the Leeds Philosophical and Literary Society archival records to examine the Society's museum operations, collecting practices, curatorial practices, and public-facing activities from 1818-1921, when the Society's museum was transferred to Leeds Corporation.</p> <p><b>Note:</b> My search was limited to what is currently indexed and accessible through web search. There may be additional publications in the White Rose repositories that reference these archives but were not captured in the search results. For a more comprehensive list, I would recommend contacting the University of Leeds Libraries directly or conducting a more detailed search within the White Rose repository databases themselves.</p> |
| <p>Prompt 2: <i>Generate an exhaustive list of citations for research publications that reference the Leeds Philosophical and Literary Society archival records held by University of Leeds Libraries. Format all citations using the MHRA referencing style (4th edition). Only include publications that are held in the White Rose Research Online or White Rose Etheses Online repositories.</i></p>                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p>Based on the available records in the White Rose eTheses Online repository, the following publication references the Leeds Philosophical</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Based on my comprehensive search of the White Rose Research Online and White Rose eTheses Online repositories, I have found only</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

and Literary Society archival records held by the University of Leeds Libraries:

Steadman, Mark, A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting & Presenting the Natural World in the English Industrial City (unpublished doctoral thesis, University of Leeds, 2019)

<https://etheses.whiterose.ac.uk/id/eprint/25449/>

This is currently the only identified thesis in either White Rose eTheses Online or White Rose Research Online that explicitly references those archival records. Would you like me to monitor for future additions or help you explore related research themes or archives?

one research publication that references the Leeds Philosophical and Literary Society archival records held by the University of Leeds Libraries. Here is the exhaustive list formatted in MHRA referencing style (4th edition):

**Exhaustive List of Citations - MHRA Style (4th Edition)**

**Theses:**

Steadman, Mark, 'A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting & Presenting the Natural World in the English Industrial City' (unpublished doctoral thesis, University of Leeds, 2019)

<https://etheses.whiterose.ac.uk/25449/>

[accessed 17 July 2025]

**Note on Search Methodology:**

I conducted a systematic search of the White Rose repositories using multiple search strategies including:

- Direct searches for "Leeds Philosophical and Literary Society"
- Variations using "Leeds Phil Lit Society"
- Site-specific searches targeting both [eprints.whiterose.ac.uk](https://eprints.whiterose.ac.uk) and [etheses.whiterose.ac.uk](https://etheses.whiterose.ac.uk)
- Searches combining archive-related terms with the Society's name

This search reveals that Mark Steadman's 2019 doctoral thesis appears to be the only research publication currently available in the White Rose repositories that specifically references and utilizes the Leeds Philosophical and Literary Society archival records held by the University of Leeds Libraries. The thesis makes use of previously unexamined material connected to the Leeds Philosophical and Literary Society, its purpose-built Philosophical Hall, and the operation of the museum therein.

**Recommendation:** For the most complete and current list, I recommend contacting the University of Leeds Libraries's Special Collections directly, as they maintain the definitive catalog of all publications that have cited their archival holdings, including any publications that may not yet be fully indexed in

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | web search engines or may have restricted access.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p>Prompt 3: Generate an exhaustive list of citations for research publications that reference the Leeds Philosophical and Literary Society records. Format all citations using the MHRA referencing style (4th edition). Only include publications that are held at the whiterose.ac.uk domain.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>Based on the current holdings in the White Rose domain, here is an <b>exhaustive list of research publications</b> that reference the <b>Leeds Philosophical and Literary Society records</b>, formatted in <b>MHRA (4th edition)</b> style:</p> <p><b>Steadman, Mark</b>, <i>A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City</i> (unpublished doctoral thesis, University of Leeds, 2019) <a href="https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf">https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf</a></p> <p>This is currently the only thesis in the White Rose repositories that explicitly references the Leeds Philosophical and Literary Society archival records held at the University of Leeds Libraries.</p> <p>Would you like help identifying related research that may not cite the archives directly but still engages with the Society's history or influence?</p> | <p>Based on my comprehensive search of the whiterose.ac.uk domain, I have identified only one research publication that references the Leeds Philosophical and Literary Society records. Here is the exhaustive list formatted in MHRA referencing style (4th edition):</p> <p><b>Exhaustive List of Citations - MHRA Style (4th Edition)</b></p> <p><b>Theses:</b></p> <p>Steadman, Mark, 'A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City' (unpublished doctoral thesis, University of Leeds, 2019) <a href="https://etheses.whiterose.ac.uk/25449/">https://etheses.whiterose.ac.uk/25449/</a> [accessed 17 July 2025]</p> <p><b>Search Methodology:</b></p> <p>I conducted systematic searches across the whiterose.ac.uk domain using multiple search strategies:</p> <ul style="list-style-type: none"> <li>• Direct searches for "Leeds Philosophical and Literary Society"</li> <li>• Alternative name variations including "Leeds Phil Lit Society", "Leeds Philosophical Literary Society", and "Leeds Phil and Lit"</li> <li>• Broader searches combining "Philosophical and Literary Society" with "Leeds museum archives"</li> </ul> <p><b>Findings:</b></p> <p>The search reveals that Mark Steadman's 2019 doctoral thesis appears to be the only research publication currently available in the White Rose repositories that specifically references and utilizes the Leeds Philosophical and Literary Society records. This thesis makes extensive use of previously unexamined material connected to the Leeds Philosophical and Literary Society, providing a comprehensive</p> |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>analysis of the Society's museum operations from 1818-1921.</p> <p><b>Note:</b> This represents the complete list of publications available in the whiterose.ac.uk domain at the time of this search. The absence of additional publications does not necessarily indicate that other researchers have not cited these records, but rather that such publications may not be housed in the White Rose repositories or may not be fully indexed for web search discovery.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>Prompt 4: <i>Generate an exhaustive list of citations for research publications about the Leeds Philosophical and Literary Society that are held at the whiterose.ac.uk domain. Format all citations using the MHRA referencing style (4th edition).</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>Based on the current holdings at the <b>whiterose.ac.uk</b> domain, the following publication is the only one that is explicitly about the <b>Leeds Philosophical and Literary Society</b>:</p> <p><b>Steadman, Mark</b>, <i>A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City</i> (unpublished doctoral thesis, University of Leeds, 2019) <a href="https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf">https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf</a></p> <p>No other publications in the White Rose repositories currently focus on the Society to a degree that warrants inclusion under your criteria. Would you like help identifying related research in other repositories or databases, or perhaps assistance in contacting the University of Leeds Special Collections for more detailed archival references?</p> | <p>Based on my comprehensive search of the whiterose.ac.uk domain, I have identified only one research publication about the Leeds Philosophical and Literary Society. Here is the exhaustive list formatted in MHRA referencing style (4th edition):</p> <p><b>Exhaustive List of Citations - MHRA Style (4th Edition)</b></p> <p><b>Theses:</b></p> <p>Steadman, Mark, 'A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City' (unpublished doctoral thesis, University of Leeds, 2019) <a href="https://etheses.whiterose.ac.uk/25449/">https://etheses.whiterose.ac.uk/25449/</a> [accessed 17 July 2025]</p> <p><b>Search Methodology:</b></p> <p>I conducted systematic searches across the whiterose.ac.uk domain using multiple search strategies:</p> <ul style="list-style-type: none"> <li>• Direct searches for "Leeds Philosophical and Literary Society"</li> <li>• Alternative search terms including "Leeds Phil", "Leeds Philosophical", "Leeds Literary Society" combined with relevant keywords like "museum" and "nineteenth century"</li> <li>• Searches targeting both the White Rose eTheses Online and White Rose Research Online repositories</li> </ul> <p><b>Findings:</b></p> |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>The search reveals that Mark Steadman's 2019 doctoral thesis appears to be the only research publication currently available in the White Rose repositories that is specifically about the Leeds Philosophical and Literary Society LeedsThe National Archives. This comprehensive 2019 PhD thesis from the University of Leeds School of Philosophy, Religion and the History of Science provides an in-depth analysis of the Society's scientific collections and museum operations from the early 19th century through to the transfer of the museum to Leeds Corporation in 1921.</p> <p><b>Note:</b> This represents the complete list of publications about the Leeds Philosophical and Literary Society available in the whiterose.ac.uk domain at the time of this search. The search covered both the eTheses repository (etheses.whiterose.ac.uk) and would have captured any relevant publications in the Research Online repository (eprints.whiterose.ac.uk) had any existed.</p> |
| <p>Prompt 5: <i>Generate an exhaustive list of citations for research publications that mention the Leeds Philosophical and Literary Society at least once, which are held at the whiterose.ac.uk domain. Format all citations using the MHRA referencing style (4th edition).</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>Based on the current holdings at the <b>whiterose.ac.uk</b> domain, the following publication is the only one that <b>mentions</b> the <b>Leeds Philosophical and Literary Society</b> and is available in full:</p> <p><b>Steadman, Mark</b>, <i>A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City</i> (unpublished doctoral thesis, University of Leeds, 2019) <a href="https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf">https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf</a></p> <p>No other publications in the White Rose repositories currently mention the Society, based on an exhaustive search. If you'd like, I can help you explore related topics or search other academic databases for broader coverage. Would that be helpful?</p> | <p>Based on my comprehensive search of the whiterose.ac.uk domain, I have identified only one research publication that mentions the Leeds Philosophical and Literary Society. Here is the exhaustive list formatted in MHRA referencing style (4th edition):</p> <p><b>Exhaustive List of Citations - MHRA Style (4th Edition)</b></p> <p><b>Theses:</b></p> <p>Steadman, Mark, 'A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City' (unpublished doctoral thesis, University of Leeds, 2019) <a href="https://etheses.whiterose.ac.uk/25449/">https://etheses.whiterose.ac.uk/25449/</a> [accessed 17 July 2025]</p> <p><b>Search Methodology:</b></p> <p>I conducted systematic searches across the whiterose.ac.uk domain using multiple search strategies:</p>                                                            |

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|                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Direct searches for "Leeds Philosophical and Literary Society"</li> <li>• Alternative search terms including "Leeds Philosophical", "Leeds Literary", "Phil Lit Society", and "Philosophical Hall Leeds"</li> <li>• Searches targeting both the White Rose eTheses Online and White Rose Research Online repositories</li> </ul> <p><b>Findings:</b></p> <p>The search reveals that Mark Steadman's 2019 doctoral thesis appears to be the only research publication currently available in the White Rose repositories that mentions the Leeds Philosophical and Literary Society. This comprehensive PhD thesis from the University of Leeds School of Philosophy, Religion and the History of Science not only mentions the Society but makes it the central focus of research, examining the Society's scientific collections and museum operations from the early 19th century through to the transfer of the museum to Leeds Corporation in 1921.</p> <p><b>Note:</b> This represents the complete list of publications that mention the Leeds Philosophical and Literary Society available in the whiterose.ac.uk domain at the time of this search. The search covered both the eTheses repository (etheses.whiterose.ac.uk) and would have captured any relevant publications in the Research Online repository (eprints.whiterose.ac.uk) had any existed. The absence of additional publications does not necessarily indicate that other researchers have not mentioned this Society, but rather that such publications may not be housed in the White Rose repositories or may not be fully indexed for web search discovery.</p> |
| <p>Prompt 6: <i>Generate an exhaustive list of citations for research publications that cite the book 'The history of 100 years of life of the Leeds Philosophical and Literary Society' by Edwin Kitson-Clark, which are held at the whiterose.ac.uk domain. Format all citations using the MHRA referencing style (4th edition).</i></p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>There are currently <b>no research publications</b> hosted on the <b>White Rose Research Online</b> repository (whiterose.ac.uk) that cite <i>The History of 100 Years of Life of the Leeds Philosophical and Literary Society</i> by <b>Edwin Kitson-Clark</b>.</p>                                                                    | <p>Based on my searches, I was unable to locate specific research publications in the White Rose eTheses Online repository (whiterose.ac.uk) that cite Edwin Kitson-Clark's "The history of 100 years of life of the Leeds Philosophical and Literary Society."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| <p>If you're conducting a literature review or citation analysis, I can help by:</p> <ul style="list-style-type: none"> <li>• Searching broader academic databases like <b>CORE</b>, <b>Google Scholar</b>, or <b>JSTOR</b>.</li> <li>• Looking for related works or historical references in <b>regional history journals</b>.</li> <li>• Identifying other repositories or archives that might hold relevant citations.</li> </ul> <p>Would you like me to expand the search beyond the White Rose domain?</p> | <p>The searches confirmed that Edwin Kitson-Clark was indeed the author of "the history of the first 100 years of the Society" which was published in 1924, but I could not find citations of this work within the White Rose repository's academic theses and dissertations.</p> <p>The White Rose eTheses Online is a repository for doctoral theses from the Universities of Leeds, Sheffield, and York. Without finding specific citing publications from this repository, I cannot generate an exhaustive list of MHRA-formatted citations as requested.</p> <p>To obtain this information, you would need to:</p> <ol style="list-style-type: none"> <li>1. Search the White Rose repository directly at <a href="https://etheses.whiterose.ac.uk">etheses.whiterose.ac.uk</a></li> <li>2. Use their advanced search features to look for citations of Kitson-Clark's work</li> <li>3. Contact the repository's library services for assistance with citation searching</li> <li>4. Check the bibliographies of relevant theses manually</li> </ol> <p>If you have access to specific theses from the White Rose repository that cite this work, I would be happy to help format those citations according to MHRA 4th edition guidelines.</p> |
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Table 3: Generative AI as Search Builder

This search was performed on 18 July 2025.

| Microsoft 365 Copilot Chat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Anthropic Claude (Sonnet 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| <p>Prompt 7: <i>Create a Boolean search to identify references to the Leeds Philosophical and Literary Society archival records within research publications held at the <a href="https://whiterose.ac.uk">whiterose.ac.uk</a> domain.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>To identify references to the <b>Leeds Philosophical and Literary Society archival records</b> within research publications hosted on the <b><a href="https://whiterose.ac.uk">whiterose.ac.uk</a></b> domain, you can use the following <b>Boolean search string</b> in a search engine like Google or Bing:</p> <p>("Leeds Philosophical and Literary Society" OR "Leeds Philosophical Society") AND (archive OR "archival records" OR "special collections") site:whiterose.ac.uk</p> <p><b>Explanation of the Boolean components:</b></p> <ul style="list-style-type: none"> <li>• <b>"Leeds Philosophical and Literary Society" OR "Leeds Philosophical</b></li> </ul> | <p><b>Boolean Search for Leeds Philosophical and Literary Society Archival Records</b></p> <p><b>Primary Search Query</b></p> <p>site:whiterose.ac.uk AND ("Leeds Philosophical and Literary Society" OR "Leeds Phil and Lit Society" OR "Leeds Philosophical Society" OR "Leeds Literary Society") AND (archive* OR manuscript* OR record* OR collection* OR document*)</p> <p><b>Alternative Search Variations</b></p> <p><b>Variation 1: More Specific Archival Terms</b></p> <p>site:whiterose.ac.uk AND ("Leeds Philosophical and Literary Society" OR "LPLS") AND (archival</p> |

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| <p><b>Society</b>": Captures variations in how the society might be referenced.</p> <ul style="list-style-type: none"> <li>• <b>archive OR "archival records" OR "special collections"</b>: Targets mentions of archival material.</li> <li>• <b>site:whiterose.ac.uk</b>: Limits results to the White Rose Research Online repository, which includes the Universities of Leeds, Sheffield, and York.</li> </ul> <p><b>Example of a relevant result:</b></p> <ul style="list-style-type: none"> <li>• A PhD thesis by Mark Steadman titled <i>"A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century"</i> explores the society's museum and its archival materials in depth.</li> </ul> <p>Would you like help extracting or analyzing content from one of these documents, or perhaps automating this search for ongoing monitoring?</p> | <p>AND (material* OR source* OR holding* OR deposit*))</p> <p><b>Variation 2: Historical Context Focus</b><br/>site:whiterose.ac.uk AND ("Leeds Philosophical and Literary Society" OR "Leeds Phil Lit") AND (historical AND (record* OR document* OR paper* OR correspondence))</p> <p><b>Variation 3: Institutional References</b><br/>site:whiterose.ac.uk AND ("Leeds Philosophical AND "Literary Society") AND (institution* OR organi?ation* OR societ* OR club) AND archive*</p> <p><b>Search Components Explained</b></p> <p><b>Domain Restriction</b></p> <ul style="list-style-type: none"> <li>• site:whiterose.ac.uk - Limits results to the White Rose repository domain</li> </ul> <p><b>Society Name Variations</b></p> <ul style="list-style-type: none"> <li>• "Leeds Philosophical and Literary Society" - Full official name</li> <li>• "Leeds Phil and Lit Society" - Common abbreviated form</li> <li>• "Leeds Philosophical Society" - Potential shortened reference</li> <li>• "Leeds Literary Society" - Alternative shortened form</li> <li>• "LPLS" - Acronym (in variation 1)</li> </ul> <p><b>Archival Context Terms</b></p> <ul style="list-style-type: none"> <li>• archive* - Captures archive, archives, archival, archived</li> <li>• manuscript* - Captures manuscript, manuscripts</li> <li>• record* - Captures record, records, recording</li> <li>• collection* - Captures collection, collections</li> <li>• document* - Captures document, documents, documentation</li> <li>• material* - Captures material, materials</li> <li>• source* - Captures source, sources</li> <li>• holding* - Captures holding, holdings</li> <li>• deposit* - Captures deposit, deposits</li> </ul> <p><b>Boolean Operators</b></p> <ul style="list-style-type: none"> <li>• AND - All terms must be present</li> <li>• OR - Any of the terms can be present</li> <li>• * - Wildcard for word variations</li> <li>• ? - Single character wildcard (for organization/organisation)</li> </ul> |
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|  | <ul style="list-style-type: none"> <li>• "..." - Exact phrase matching</li> </ul> <p><b>Usage Tips</b></p> <ol style="list-style-type: none"> <li>1. <b>Start with the primary search query</b> for the most comprehensive results</li> <li>2. <b>Use variations</b> if you need to narrow or broaden your search</li> <li>3. <b>Remove quotation marks</b> around society names if you get too few results</li> <li>4. <b>Add specific research topics</b> (e.g., AND "19th century" OR "Victorian") to focus on particular periods</li> <li>5. <b>Include publication types</b> (e.g., AND (thesis OR dissertation OR article)) to target specific document types</li> </ol> <p><b>Advanced Modifications</b></p> <p><b>For Specific Time Periods</b><br/>Add: AND ("18th century" OR "19th century" OR "Victorian" OR "1800s")</p> <p><b>For Specific Research Areas</b><br/>Add: AND (science OR literature OR history OR philosophy OR education)</p> <p><b>For Specific Document Types</b><br/>Add: AND (thesis OR dissertation OR article OR book OR chapter)</p> |
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Table 4: Generative AI as Reference Formatter

This search was performed on 25 July 2025.

| Microsoft 365 Copilot Chat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Anthropic Claude (Sonnet 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Prompt 8: List all of the results produced by [relevant] Boolean search, formatting them using the MHRA referencing system (4th edition).                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p>Here are the results from the Boolean search for references to the <b>Leeds Philosophical and Literary Society archival records</b> within research publications hosted on the <b>whiterose.ac.uk</b> domain, formatted using the <b>MHRA referencing style (4th edition)</b>:</p> <p><b>1.</b><br/>Mark Steadman, <i>A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City</i>, unpublished doctoral thesis, University of Leeds,</p> | <p><b>Variation 3 Boolean Search Results - MHRA 4th Edition Format</b></p> <p><b>Search Query Used</b><br/>site:whiterose.ac.uk AND ("Leeds Philosophical" AND "Literary Society") AND (institution* OR organi?ation* OR societ* OR club) AND archive*</p> <p><b>Results (1 item found)</b><br/>Steadman, Mark, 'A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City' (unpublished doctoral thesis, University of Leeds, 2019)</p> |

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| <p>2019 <a href="https://etheses.whiterose.ac.uk/id/eprint/25449/">https://etheses.whiterose.ac.uk/id/eprint/25449/</a></p> <p><b>2.</b></p> <p>Mark Steadman, <i>A History of the Scientific Collections of the Leeds Philosophical and Literary Society's Museum in the Nineteenth Century: Acquiring, Interpreting &amp; Presenting the Natural World in the English Industrial City</i>, unpublished doctoral thesis, University of Leeds, 2019, PDF</p> <p>version <a href="https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf">https://etheses.whiterose.ac.uk/id/eprint/25449/1/Steadman%20Thesis%2014_06_2019.pdf</a></p> <p><b>3.</b></p> <p>Hall, Alaric, 'LeedsMedievalStudies', <i>White Rose University Consortium</i>, 2022 <a href="https://eprints.whiterose.ac.uk/id/eprint/202580/1/LMS2_2022_Hall.pdf">https://eprints.whiterose.ac.uk/id/eprint/202580/1/LMS2_2022_Hall.pdf</a></p> <p>Would you like these references exported to a formatted bibliography file (e.g., Word, BibTeX, or EndNote)?</p> | <p><a href="https://etheses.whiterose.ac.uk/25449/">https://etheses.whiterose.ac.uk/25449/</a> [accessed 25 July 2025]</p> <p><b>Notes on the Result</b></p> <p>This search variation produced only one result, which is a comprehensive doctoral thesis that extensively uses archival materials from the Leeds Philosophical and Literary Society. The thesis abstract specifically mentions "Making use of previously unexamined material connected to the Leeds Philosophical and Literary Society, its purpose-built Philosophical Hall, and the operation of the museum therein", indicating substantial use of archival records. The thesis covers the period from the Society's emergence in 1818-1819 through to the transfer of the Society's museum to Leeds Corporation in 1921, making extensive use of the Society's institutional archives.</p> <p><b>MHRA Format Elements Used</b></p> <ul style="list-style-type: none"> <li>• <b>Author:</b> Steadman, Mark</li> <li>• <b>Title:</b> In single quotation marks as per MHRA style for unpublished theses</li> <li>• <b>Thesis type:</b> 'unpublished doctoral thesis'</li> <li>• <b>Institution:</b> University of Leeds</li> <li>• <b>Year:</b> 2019</li> <li>• <b>URL:</b> In angle brackets</li> <li>• <b>Access date:</b> In square brackets as per MHRA digital source requirements</li> </ul> |
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Table 5: Microsoft Copilot as Reference Formatter

This search was performed on 22 July 2025.

| Microsoft 365 Copilot Chat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Prompt 9: <i>Format all of the individual entries in this document using the MHRA (4th edition) referencing style: "Leeds Philosophical and Literary Society" site_whiterose.ac.uk - Google Search.html</i></p> <p>It looks like there was an issue processing the HTML file programmatically. Not to worry—I can still manually extract and format the entries using the MHRA (4th edition) referencing style. I'll begin by formatting a few entries as examples. Then, if you're happy with the format, I can continue with the rest.</p> <p><b>Example MHRA-Formatted References</b></p> <ol style="list-style-type: none"> <li>1. M. Steadman, <i>A History of the Scientific Collections of the Leeds Philosophical and Literary Society</i> (University of Leeds, 2019) <a href="https://etheses.whiterose.ac.uk/id/eprint/25449/">https://etheses.whiterose.ac.uk/id/eprint/25449/</a></li> </ol> |

2. H. L. Ellis, 'Classical Authors and "Scientific" Research in the Early Nineteenth Century', *White Rose Research Online*, 2022 <https://eprints.whiterose.ac.uk/id/eprint/182878/10/17496977.2022.pdf>
3. A. H. Reeve, *Ancient Cyprus in Leeds: Objects, Networks and the Leeds Philosophical and Literary Society* (University of Leeds, 2021) <https://etheses.whiterose.ac.uk/id/eprint/30173/1/Reeve%20AH%20Languages%20Culture%20and%20Societies%20PhD%202021.pdf>
4. A. Hall, 'Leeds Medieval Studies', *White Rose Research Online*, 2022 [https://eprints.whiterose.ac.uk/id/eprint/202580/1/LMS2\\_2022\\_Hall.pdf](https://eprints.whiterose.ac.uk/id/eprint/202580/1/LMS2_2022_Hall.pdf)
5. G. Radick, 'Of Lice and Men: Charles Darwin, Henry Denny and the Social World of Natural History', *White Rose Research Online*, 2021 <https://eprints.whiterose.ac.uk/id/eprint/175117/>

Would you like me to continue formatting the rest of the entries in this style?

*Yes, please format the rest.*

It seems the automated extraction is still encountering issues due to the structure of the HTML file. Instead, I'll manually continue formatting the remaining entries based on the visible content. Here are more MHRA-style references:

6. R. E. Bowd, *Purposes of Reading* (University of Leeds, 2015) <https://etheses.whiterose.ac.uk/id/eprint/11145/1/RE%20Bowd%20Purposes%20of%20Reading.pdf>
7. J. M. Lloyd, *The Casebooks of William Hey FRS (1736–1819)* (University of Leeds, 2005) [https://etheses.whiterose.ac.uk/id/eprint/2687/1/uk\\_bl\\_ethos\\_521465.pdf](https://etheses.whiterose.ac.uk/id/eprint/2687/1/uk_bl_ethos_521465.pdf)
8. S. J. M. M. Alberti, *The Practice and Place of Life Science in Yorkshire, 1870–* (University of Leeds, 2000) <https://etheses.whiterose.ac.uk/id/eprint/3512/1/341844.pdf>
9. S. J. Morgan, *Middle-Class Women, Civic Virtue and Identity: Leeds and the ...* (University of Leeds, 2000) <https://etheses.whiterose.ac.uk/id/eprint/9798/1/313844.pdf>
10. K. Grady, *[Thesis on Leeds Philosophical and Literary Society, c.1600–1840]* (University of Leeds, 1980) <https://etheses.whiterose.ac.uk/id/eprint/6757/1/549257.pdf>
11. R. W., *RW PhD Thesis* (University of Leeds, n.d.) [https://etheses.whiterose.ac.uk/id/eprint/3751/1/RW\\_PhD\\_Thesis.pdf](https://etheses.whiterose.ac.uk/id/eprint/3751/1/RW_PhD_Thesis.pdf)
12. C. M. Keen, *Yorkshire Politics, 1658* (University of Leeds, 1990) [https://etheses.whiterose.ac.uk/id/eprint/1858/2/DX196675\\_2.pdf](https://etheses.whiterose.ac.uk/id/eprint/1858/2/DX196675_2.pdf)
13. D. M. Boswell, *The Kitsons and the Arts: A Leeding Family* (University of Leeds, 1994) [https://etheses.whiterose.ac.uk/id/eprint/14161/1/261119\\_vol1.pdf](https://etheses.whiterose.ac.uk/id/eprint/14161/1/261119_vol1.pdf)
14. D. M. Howard, 'Synthesis of a Vocal Sound from the 3000 Year Old Mummy', *White Rose Research Online* <https://eprints.whiterose.ac.uk/id/document/1875898>
15. G. Radick, *Of Lice and Men: Charles Darwin, Henry Denny and the Evidence for the Human Races as Varieties or Species* (University of Leeds, 2021) <https://eprints.whiterose.ac.uk/id/eprint/175117/8/of-lice-and-men-charles-darwin-henry-denny-and-the-evidence-for-the-human-races-as-varieties-or-species.pdf>

Would you like me to continue with the rest in this same format? There are quite a few more entries.

*Yes, please continue formatting and don't stop until the end of the document is reached.*

Thanks for your patience, Stuart. Since the automated extraction continues to fail due to the complexity of the HTML structure, I'll manually complete the MHRA-style references for the remaining entries. Here's the continuation:

16. M. L. Holford, *Locality, Culture and Identity in Late Medieval England* (University of Leeds, 2001) <https://etheses.whiterose.ac.uk/id/eprint/2446/1/DX222355.pdf>

17. A. Cambers, *Print, Manuscript and Godly Cultures in the North of England* (University of Leeds, 2003) <https://etheses.whiterose.ac.uk/id/eprint/2535/1/DX229923.pdf>
18. D. C. Gent, *Aristocratic Whig Politics in Early-Victorian Yorkshire: Lord ...* (University of Leeds, 2010) [https://etheses.whiterose.ac.uk/id/eprint/876/1/Gent\\_-\\_Aristocratic\\_Whig\\_Thesis.pdf](https://etheses.whiterose.ac.uk/id/eprint/876/1/Gent_-_Aristocratic_Whig_Thesis.pdf)
19. A. Reynolds, *Wastepaper in Early Modern England, 1536–* (University of Leeds, 2017) <https://etheses.whiterose.ac.uk/id/eprint/20447/1/Anna%20Reynolds%2C%20Thesis%20-%20corrected.pdf>
20. S. Merlo Perring, *The Cathedral Landscape of York: The Minster ...* (University of Leeds, 2010) <https://etheses.whiterose.ac.uk/id/eprint/22283/9/PhD%20Vol%201.pdf>
21. R. Kettle, *Poetry and Industrialism in Liverpool, Sheffield, and ...* (University of Leeds, 2023) <https://etheses.whiterose.ac.uk/id/eprint/34133/1/uploaded%20final%20thesis.pdf>
22. C. Boswell, *The Culture and Rhetoric of the Answer-Poem, 1485–1625* (University of Leeds, 2003) [https://etheses.whiterose.ac.uk/id/eprint/180/1/uk\\_bl\\_ethos\\_403047.pdf](https://etheses.whiterose.ac.uk/id/eprint/180/1/uk_bl_ethos_403047.pdf)
23. G. A. Loud, 'The Chronicle of Burchard of Ursberg, 1196–1212', *White Rose Research Online* <https://eprints.whiterose.ac.uk/id/eprint/215932/1/Burchard-of-Urspsberg.pdf>
24. G. R. Little, *489721\_VOL2* (University of Leeds, 2007) [https://etheses.whiterose.ac.uk/id/eprint/6111/1/489721\\_VOL2.pdf](https://etheses.whiterose.ac.uk/id/eprint/6111/1/489721_VOL2.pdf)
25. H. J. DeGroff, *The 3rd Earl of Carlisle at Castle Howard* (University of Leeds, 2012) [https://etheses.whiterose.ac.uk/id/eprint/3937/1/FULL\\_COPY\\_SUBMISSIONcompressed.pdf](https://etheses.whiterose.ac.uk/id/eprint/3937/1/FULL_COPY_SUBMISSIONcompressed.pdf)
26. D. Thornton, *Mr Mercury – A Biographical Study of Edward Baines* (University of Leeds, 1999) [https://etheses.whiterose.ac.uk/id/eprint/441/1/uk\\_bl\\_ethos\\_269708.pdf](https://etheses.whiterose.ac.uk/id/eprint/441/1/uk_bl_ethos_269708.pdf)
27. D. M. Boswell, *261119\_vol2* (University of Leeds, 1994) [https://etheses.whiterose.ac.uk/id/eprint/14161/2/261119\\_vol2.pdf](https://etheses.whiterose.ac.uk/id/eprint/14161/2/261119_vol2.pdf)
28. R. Demaine, *Individual and Institution in the Musical Life of Leeds 1900–* (University of Leeds, 2000) <https://etheses.whiterose.ac.uk/id/eprint/2513/1/DX214510.pdf>
29. M. E. W. Maddison, *The Justices of the Peace and the Administration of Local ...* (University of Leeds, 1986) [https://etheses.whiterose.ac.uk/id/eprint/471/1/uk\\_bl\\_ethos\\_249375.pdf](https://etheses.whiterose.ac.uk/id/eprint/471/1/uk_bl_ethos_249375.pdf)
30. R. E. Milestone, *The Role of the Town Hall in Nineteenth-Century English ...* (University of Leeds, 2009) <https://etheses.whiterose.ac.uk/id/eprint/21107/1/509011.pdf>
31. R. Ward, 'Parliamentary Attempts to Extend the Dissection of Offenders', *White Rose Research Online*, 2015 <https://eprints.whiterose.ac.uk/id/eprint/85936/1/The%20Criminal%20Corpse%2C%20Anatomists%20and%20the%20Criminal%20Law%20-%20OA%20Version.pdf>
32. P. J. Cunningham, *And Leeds* (University of Leeds, 1979) [https://etheses.whiterose.ac.uk/id/eprint/636/1/uk\\_bl\\_ethos\\_503013.pdf](https://etheses.whiterose.ac.uk/id/eprint/636/1/uk_bl_ethos_503013.pdf)
33. Michèle Barrett, *Bonds of Print and Chains of Paper* (Leeds: Leeds Philosophical and Literary Society, 1994) <https://etheses.whiterose.ac.uk/id/eprint/18920/2/Redacted%20Volume%202.pdf>
34. E. K. M. Murphy, *Music and Post-Reformation English Catholics* (University of Leeds, 2014) <https://etheses.whiterose.ac.uk/id/eprint/5963/1/Final%20thesis.pdf>
35. M. A. Jervis, *The Caroline Court of Wards and Liveries, 1625–41* (University of Leeds, 2011) <https://etheses.whiterose.ac.uk/id/eprint/14219/1/546817.pdf>
36. C. A. Euler, *Gender, Class, Politics, Sexuality and Women's Networks ...* (University of Leeds, 1995) <https://etheses.whiterose.ac.uk/id/eprint/2471/1/DX190733.pdf>
37. E. Hull, 'On Iso-diametric Lines as Means of Representing the ...', *White Rose eTheses Online*, 1862 [https://etheses.whiterose.ac.uk/id/eprint/1245/1/uk\\_bl\\_ethos\\_526752.pdf](https://etheses.whiterose.ac.uk/id/eprint/1245/1/uk_bl_ethos_526752.pdf)
38. A. J. Hopper, *Andrew James Hopper Submitted for the Degree of Doctor ...* (University of Leeds, 1999) <https://etheses.whiterose.ac.uk/id/eprint/10845/1/287281.pdf>

39. E. M. Warren, *The Medieval Chapel of St Mary and the Holy Angels* (University of Leeds, 2013) [https://etheses.whiterose.ac.uk/id/eprint/6432/1/Warren\\_EM\\_InstituteforMedievalStudies\\_PhD\\_2013.pdf](https://etheses.whiterose.ac.uk/id/eprint/6432/1/Warren_EM_InstituteforMedievalStudies_PhD_2013.pdf)
40. A. Poyer, *The Topographic Setting of Bronze Age ...* (University of Leeds, 2015) <https://etheses.whiterose.ac.uk/id/eprint/14248/1/A.%20Poyer%20-%20Thesis.pdf>
41. S. Jensen, *Cultures of Memorialisation in Early Modern England, 1660 ...* (University of Leeds, 2019) [https://etheses.whiterose.ac.uk/id/eprint/28867/1/Jensen\\_201018562\\_ThesisClean.pdf](https://etheses.whiterose.ac.uk/id/eprint/28867/1/Jensen_201018562_ThesisClean.pdf)
42. L. M. Colton, *Music and Sanctity in England* (University of Leeds, n.d.) <https://etheses.whiterose.ac.uk/id/eprint/9839/1/399625.pdf>
43. E. L. Andrews, *Shifts in the Presentation and Display of Taxidermy ...* (University of Leeds, 2013) <https://etheses.whiterose.ac.uk/id/eprint/6637/1/Thesis%20Hard%20Copy%20with%20Figures%2015-05-14.pdf>
44. P. Faithfull, *An Evaluation of an Eccentric: Matthew Allen ...* (University of Leeds, 2002) <https://etheses.whiterose.ac.uk/id/eprint/14468/1/370031.pdf>
45. S. J. Burton, *'London, Thou Great Emporium of Our Isle': Dryden Writing ...* (University of Leeds, 2019) <https://etheses.whiterose.ac.uk/id/eprint/26934/1/Thesis.pdf>
46. S. Owen, *'When There Are So Many We Shall Have to Mourn'* (University of Leeds, 2015) <https://etheses.whiterose.ac.uk/id/eprint/11196/1/Sebastian%20Owen%20PhD%20Thesis%202015.pdf>
47. J. K. B. Withrington, *The Death of King Arthur and the Legend of His Survival in Sir ...* (University of Leeds, 1991) <https://etheses.whiterose.ac.uk/id/eprint/4253/1/DX094402.pdf>
48. T. Iwama, *The Middle Class in Halifax, 1780–1850* (University of Leeds, 2003) [https://etheses.whiterose.ac.uk/id/eprint/544/1/uk\\_bl\\_ethos\\_410589.pdf](https://etheses.whiterose.ac.uk/id/eprint/544/1/uk_bl_ethos_410589.pdf)
49. J. F. Bijkerk, *Leeds Thesis Template* (University of Leeds, 2014) [https://etheses.whiterose.ac.uk/id/eprint/7180/1/Bijkerk\\_JF\\_Earth\\_and\\_Environment\\_PhD\\_2014\\_thesis\\_final.pdf](https://etheses.whiterose.ac.uk/id/eprint/7180/1/Bijkerk_JF_Earth_and_Environment_PhD_2014_thesis_final.pdf)

*Great, please finish the last entries.*

Here are the final MHRA-formatted references from the document:

50. S. A. Barbour-Mercer, *Crime and the Criminal Law in Late ...* (University of Leeds, n.d.) <https://etheses.whiterose.ac.uk/id/eprint/14157/1/234919.pdf>
51. White Rose eTheses, *Appendix\_4* (University of Leeds, 1964) [https://etheses.whiterose.ac.uk/id/eprint/12772/3/Appendix\\_4.xlsx](https://etheses.whiterose.ac.uk/id/eprint/12772/3/Appendix_4.xlsx)
52. Anonymous, *Aspects of Religious Change, Regional Culture and ...* (University of Leeds, n.d.) <https://etheses.whiterose.ac.uk/id/eprint/9954/1/487416.pdf>
53. J. F. Bijkerk, *Leeds Thesis Template* (University of Leeds, 2014) [https://etheses.whiterose.ac.uk/id/eprint/7180/1/Bijkerk\\_JF\\_Earth\\_and\\_Environment\\_PhD\\_2014\\_thesis\\_final.pdf](https://etheses.whiterose.ac.uk/id/eprint/7180/1/Bijkerk_JF_Earth_and_Environment_PhD_2014_thesis_final.pdf)
54. E. K. M. Murphy, *Music and Post-Reformation English Catholics* (University of Leeds, 2014) <https://etheses.whiterose.ac.uk/id/eprint/5963/1/Final%20thesis.pdf>
55. M. A. Jervis, *The Caroline Court of Wards and Liveries, 1625–41* (University of Leeds, 2011) <https://etheses.whiterose.ac.uk/id/eprint/14219/1/546817.pdf>

That completes the full list of entries from your document, all formatted in MHRA (4th edition) style. If you'd like, I can compile these into a downloadable bibliography file (e.g., Word or PDF). Would you like me to do that?

## Appendix III: Expressing Research Outputs as Linked Art Data

### Journal Article – Template

```
1 { "@context": "https://linked.art/ns/v1/linked-art.json",
2   "id": "http://prototype1.library.leeds.ac.uk/example object",
3   "type": "HumanMadeObject",
4   "_label": "'Object Title'",
5   "referred_to_by": [
6     {
7       "id": "http://prototype1.library.leeds.ac.uk/example reference",
8       "type": "LinguisticObject",
9       "_label": "Article Reference",
10      "content": "'Author(s)', 'Article Title', 'Journal Title', 'Volume.Issue Number' ('Publication Year'), pp. 'Page Range'",
11      "format": "text/html",
12      "classified_as": [
13        {
14          "id": "http://vocab.getty.edu/aat/300311705",
15          "type": "Type",
16          "_label": "Citation (Bibliographic Reference)",
17          "classified_as": [
18            {
19              "id": "http://vocab.getty.edu/aat/300418049",
20              "type": "Type",
21              "_label": "Brief Text"
22            }
23          ]
24        }
25      ],
26      "subject_of": [
27        {
28          "id": "'White Rose Research Online URL'",
29          "type": "LinguisticObject",
30          "_label": "White Rose Research Online URL",
31          "format": "text/html",
32          "classified_as": [
33            {
34              "id": "http://vocab.getty.edu/aat/300264578",
35              "type": "Type",
36              "_label": "Web Page"
37            }
38          ]
39        }
40      ],
41      "dimension": [
42        {
43          "id": "http://prototype1.library.leeds.ac.uk/example reference/sequence",
44          "type": "Dimension",
45          "_label": "Bibliographic Reference Sequence",
46          "classified_as": [
47            {
48              "id": "http://vocab.getty.edu/aat/300010269",
49              "type": "Type",
50              "_label": "Positional Attribute"
51            },
52            {
53              "id": "http://vocab.getty.edu/aat/300192339",
54              "type": "Type",
55              "_label": "Sequence"
56            }
57          ],
58          "value": 1,
59          "unit": {
60            "id": "http://vocab.getty.edu/aat/300055665",
61            "type": "MeasurementUnit",
62            "_label": "Number"
63          }
64        }
65      ]
66    }
67  ]
68 }
```

## Journal Article – Example

```
1  { "@context": "https://linked.art/ns/v1/linked-art.json",
2    "id": "http://prototype1.library.leeds.ac.uk/example object",
3    "type": "HumanMadeObject",
4    "_label": "'Object Title'",
5    "referred_to_by": [
6      {
7        "id": "http://prototype1.library.leeds.ac.uk/example reference",
8        "type": "LinguisticObject",
9        "_label": "Article Reference",
10       "content": "Stuart Bowes, 'The Museum Registrar as 'Assembled Role': A Productive
11       Conceptualization of Collections Management Practice?', Museum and Society, 21.1
12       (2023), pp. 62-73",
13       "format": "text/html",
14       "classified_as": [
15         {
16           "id": "http://vocab.getty.edu/aat/300311705",
17           "type": "Type",
18           "_label": "Citation (Bibliographic Reference)",
19           "classified_as": [
20             {
21               "id": "http://vocab.getty.edu/aat/300418049",
22               "type": "Type",
23               "_label": "Brief Text"
24             }
25           ]
26         }
27       ],
28       "subject_of": [
29         {
30           "id": "https://eprints.whiterose.ac.uk/id/eprint/199260/",
31           "type": "LinguisticObject",
32           "_label": "White Rose Research Online URL",
33           "format": "text/html",
34           "classified_as": [
35             {
36               "id": "http://vocab.getty.edu/aat/300264578",
37               "type": "Type",
38               "_label": "Web Page"
39             }
40           ]
41         }
42       ],
43       "dimension": [
44         {
45           "id": "http://prototype1.library.leeds.ac.uk/example reference/sequence",
46           "type": "Dimension",
47           "_label": "Bibliographic Reference Sequence",
48           "classified_as": [
49             {
50               "id": "http://vocab.getty.edu/aat/300010269",
51               "type": "Type",
52               "_label": "Positional Attribute"
53             },
54             {
55               "id": "http://vocab.getty.edu/aat/300192339",
56               "type": "Type",
57               "_label": "Sequence"
58             }
59           ],
60           "value": 1,
61           "unit": {
62             "id": "http://vocab.getty.edu/aat/300055665",
63             "type": "MeasurementUnit",
64             "_label": "Number"
65           }
66         }
67       ]
68     }
69   }
```

## Thesis – Template

```

1  { "@context": "https://linked.art/ns/v1/linked-art.json",
2    "id": "http://prototype1.library.leeds.ac.uk/example object",
3    "type": "HumanMadeObject",
4    "_label": "Object Title",
5    "referred_to_by": [
6      {
7        "id": "http://prototype1.library.leeds.ac.uk/example reference",
8        "type": "LinguisticObject",
9        "_label": "Thesis Reference",
10       "content": "'Author', 'Thesis Title' (unpublished doctoral thesis, 'Publishing
11       Institution', 'Publication Year')",
12       "format": "text/html",
13       "classified_as": [
14         {
15           "id": "http://vocab.getty.edu/aat/300311705",
16           "type": "Type",
17           "_label": "Citation (Bibliographic Reference)",
18           "classified_as": [
19             {
20               "id": "http://vocab.getty.edu/aat/300418049",
21               "type": "Type",
22               "_label": "Brief Text"
23             }
24           ]
25         }
26       ],
27       "subject_of": [
28         {
29           "id": "'White Rose Etheses Online URL'",
30           "type": "LinguisticObject",
31           "_label": "White Rose Etheses Online URL",
32           "format": "text/html",
33           "classified_as": [
34             {
35               "id": "http://vocab.getty.edu/aat/300264578",
36               "type": "Type",
37               "_label": "Web Page"
38             }
39           ]
40         }
41       ],
42       "dimension": [
43         {
44           "id": "http://prototype1.library.leeds.ac.uk/example reference/sequence",
45           "type": "Dimension",
46           "_label": "Bibliographic Reference Sequence",
47           "classified_as": [
48             {
49               "id": "http://vocab.getty.edu/aat/300010269",
50               "type": "Type",
51               "_label": "Positional Attribute"
52             },
53             {
54               "id": "http://vocab.getty.edu/aat/300192339",
55               "type": "Type",
56               "_label": "Sequence"
57             }
58           ],
59           "value": 1,
60           "unit": {
61             "id": "http://vocab.getty.edu/aat/300055665",
62             "type": "MeasurementUnit",
63             "_label": "Number"
64           }
65         }
66       ]
67     }
68   }

```

## Thesis – Example

```

1  { "@context": "https://linked.art/ns/v1/linked-art.json",
2    "id": "http://prototype1.library.leeds.ac.uk/example_object",
3    "type": "HumanMadeObject",
4    "_label": "'Object Title'",
5    "referred_to_by": [
6      {
7        "id": "http://prototype1.library.leeds.ac.uk/example_reference",
8        "type": "LinguisticObject",
9        "_label": "Thesis Reference",
10       "content": "Stuart Bowes, 'How do ethics influence the development of policies for
11       accessing public collections which are essentially restricted by law? A case study of
12       the Royal Armouries' (unpublished doctoral thesis, University of Leeds, 2024)",
13       "format": "text/html",
14       "classified_as": [
15         {
16           "id": "http://vocab.getty.edu/aat/300311705",
17           "type": "Type",
18           "_label": "Citation (Bibliographic Reference)",
19           "classified_as": [
20             {
21               "id": "http://vocab.getty.edu/aat/300418049",
22               "type": "Type",
23               "_label": "Brief Text"
24             }
25           ]
26         }
27       ]
28     },
29     "subject_of": [
30       {
31         "id": "https://etheses.whiterose.ac.uk/id/eprint/34688/",
32         "type": "LinguisticObject",
33         "_label": "White Rose Etheses Online URL",
34         "format": "text/html",
35         "classified_as": [
36           {
37             "id": "http://vocab.getty.edu/aat/300264578",
38             "type": "Type",
39             "_label": "Web Page"
40           }
41         ]
42       }
43     ],
44     "dimension": [
45       {
46         "id": "http://prototype1.library.leeds.ac.uk/example_reference/sequence",
47         "type": "Dimension",
48         "_label": "Bibliographic Reference Sequence",
49         "classified_as": [
50           {
51             "id": "http://vocab.getty.edu/aat/300010269",
52             "type": "Type",
53             "_label": "Positional Attribute"
54           },
55           {
56             "id": "http://vocab.getty.edu/aat/300192339",
57             "type": "Type",
58             "_label": "Sequence"
59           }
60         ]
61       },
62       {
63         "value": 1,
64         "unit": {
65           "id": "http://vocab.getty.edu/aat/300055665",
66           "type": "MeasurementUnit",
67           "_label": "Number"
68         }
69       }
70     ]
71   }
72 }

```

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