



Critical Approaches to ‘Clerical’ Work: Textual Transmission in Two Swedish Digital Resources

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Abstract

In this paper, we investigate the distinction between library digitization projects and digital scholarly editing projects by using qualitative interview data gathered from two Swedish digital scholarship ecosystems: 1) Litterarturbanken (the Swedish Literature Bank) and its collaboration with Gothenburg University Library, and 2) the internal collaboration at Uppsala University Library and the resulting digital output on the ALVIN platform. After examining the elements of digital editing practice that show up in each of these collaborations, we argue that these distinctions are blurring, and we call for a reorientation from critical versus noncritical editing towards critical transmission activities, which allows more room for less easily definable digital publishing projects to be examined. Further, we conclude that librarians, library-based textual scholars, and library technologists such as image technicians, digitization coordinators, and photographers are actively participating in the critical transmission of literary texts and the reframing of the institutionally enforced boundaries between the terms ‘librarian’ and ‘scholar.’

Keywords: digitization; digital scholarly editing; digital libraries; textual scholarship; library collaboration

1. Library Digitization and Digital Scholarly Editing

In the past twenty years, digitization – ‘the process of creating digital representations of information resources recorded on analog carriers’ (Xie & Matusiak, 2015, p. 59) – of cultural heritage collections has become an increasingly common practice in European libraries (Coutts, 2016). By the year 2000, several local and national digitization initiatives were underway at libraries across Europe and many more were in their infancy (Raitt, 2000). As private and public funding for digitization has proliferated alongside photographic and automatic scanning technology, such projects have continued to expand. Indeed, digitization has become a central mission of institutions across Western and Northern Europe, and increasingly so in Eastern Europe (Aparac-Jelušić, 2017). The mission statements and policy documents from these libraries have pointed to digitization’s efficacy as a tool to increase access for users across geographic boundaries and build diverse digital collections of material objects for research (Erway, 2012).

The rise of digitization has also engendered a rich and diverse discourse around the history, theory, and practice of photography and scanning image and metadata processing, and digital dissemination of a broad range of collections to a broad range of users. Aparac-Jeluši (2017, p. 51) notes that early digitization efforts at European libraries focused on making the unique or well-known treasures of a given library (such as the Gutenberg Bible) available to harness increased public interest in the World Wide Web and as a point of institutional pride. Milne (2008, p. 5) called these efforts ‘boutique’ digitization, and argued for the turn toward mass digitization, or the (relatively) fast processing of collections selected not for their content, but for their ability to undergo scanning on an industrial scale, such as the Google Books Library at Oxford University.¹ The term ‘critical digitization’ was introduced to the librarian’s lexicon by Mats Dahlström (2010), who distinguished it from mass digitization not by the size of a given collection submitted to the digitization process, but by the activities in the digitization workflow through which the process is carried out. Increased library digitization activity across the spectrum of collection sizes and types, with a corresponding need for metadata standards, turned the discourse toward effective workflow implementation (Schöneberg, Schmidt, & Höhn, 2013) and guidelines for technical best practices and state-of-the-art equipment (Ivanova, Dobрева, Stanchev, & Totkov, 2012). Attention has also been given to the increased implementation of 3D (Pavlidis, Koutsoudis, Arnaoutoglou, Tsioukas, & Chamzas, 2007) and

multi-spectral imaging techniques in the field of cultural heritage digitization (Giacometti et al., 2015). This attention has helped to expand the predominant focus in the field from text-bearing objects with typographical and zonal complexities like newspapers and printed books, to include items with material complexity, such as those that have been physically damaged, like the Great Parchment Book, held at the London Metropolitan Archives (Pal et al., 2016), or for which text appears on multiple planes, such as the Chinese Oracle Bones at Cambridge University Library.²

After determining that Europe has seen a rapid period of adoption and experimentation in library digitization, Melissa Terras (2015) argues that the cultural heritage sector is currently grappling with a phase where users expect to see digital collections available online. This change has exposed the tension in libraries between allocating adequate resources and infrastructure for digitization and supporting more traditional in-person library activities. However, while the digitization of collections in libraries may shift with user needs, funding availability, development of new equipment, techniques, and institutional frameworks, one constant effect of digitization – and by extension digital publishing – is that the process increasingly involves the expertise and collaboration of librarians, conservators, image technicians, system administrators, and software and web developers. Aside from cultural heritage digitization, librarians, conservators, image technicians, and library-based technologists also provide essential research practices such as conservation of physical materials, digital cataloguing and metadata of XML transcriptions (so that a project is easier for interested parties to find and use), and the long-term preservation of digital projects and data.

Much like digitization, digital scholarly editing – the complex process through which text-based primary sources are analyzed, collated, transcribed, encoded, and disseminated to academic and public audiences in digital formats – has developed extensively from the 1990s to the present (Schreibman, 2013). Digital scholarly editing grew out of a several hundred-year print tradition wherein textual scholars worked together with printers and publishers to create and distribute highly academic, critically annotated, and – in some cases – emended versions of primary sources, which in turn grew out of the monastic scribal tradition of the medieval period in Europe. According to D.C. Greetham, ‘classical and biblical scholarship [...] were the first two areas in which textual analysis was practiced’ (2013, p. 16).³ The most common primary sources subjected to (digital) scholarly editing are

identified by Susan Hockey (2000, p. 2) as “poetry, novels, plays, and historical documents.” These historical documents can include non-fiction texts, such as diaries and correspondence that provide an intimate portrait of social movements, wars, and the experiences of everyday life. More frequently, works of fiction – such as well-known or ‘established’ canonical works and earlier drafts and multiple versions (or ‘variants’) of these texts – have been edited and disseminated in print and digital scholarly editions. These examples are by no means exhaustive, but serve to provide a picture of the types of documents that are of interest to textual scholars.

In contrast to commercial publishing, the process of digital scholarly editing does not necessarily end with a reading copy (often called a ‘fair copy’) of a given text. Rather, digital scholarly editors use documentary evidence such as manuscripts and printed books to perform a variety of tasks, depending on the editorial tradition to which they are adhering.⁴ As regards literary analyses – which besides biblical and classical works is the primary study of textual scholarship – these tasks may include establishing the intent of the author, tracing the history of an ‘established’ text’s transmission through different editions and formats, researching how possible variants of a text show up in multiple manuscripts, and/or delineating the overall development of a literary work over a series of draft manuscripts and publications. Depending on the period in which the manuscripts were written and the number of variants to be assessed, these types of analyses may require skills in philology, codicology, paleography, and collation. Present in all traditions of digital scholarly editing are practices of text encoding, bibliography, digitization, software development, web-based publishing, and digital preservation. As it is rare for a single textual scholar to possess both the manuscripts and all the tools and skills needed to select, collate, digitize, encode, analyze, and transmit texts (and any resulting print and digital publications) for readers, digital scholarly editing has, like library digitization, increasingly relied on the collaborative efforts of scholarly editors, librarians, and developers (Boot & Van Zundert, 2011; McCarty, 2012; Pierazzo, 2015, p. 135; Sahle, 2016).

1.1. Research Questions, Aim, and Scope

Noted textual scholar D.C. Greetham (1992) wrote that there was an essential split in textual scholarship “between nontextual or noncritical editing, in which an editor reproduces an established text rather than establishes a new

one, and textual or critical editing, in which the scholar creates a text in a form not hitherto available" (p.113). In 2001, Allen Renear laid out a problem with the distinction between critical and noncritical editing, writing that

"non-critical editing is the very foundation of the creation of digital resources such as digital libraries [...]. All sorts of mistakes and confusions abound, not least of which is that libraries and archives frequently treat the creation of digital resources as a kind of mechanical 'media conversion'" (Renear, 2001, p. 31).

Renear went on to state that while critical editing receives significant attention from the textbooks and leading articles about textual scholarship (2001, p. 31–33), noncritical editing is seen as 'simple' by comparison and therefore undeserving of serious consideration and theoretical underpinning by textual scholars. As Renear writes, "the study of critical editing and the study of noncritical editing is in inverse proportion to their relative *practical* importance" (p. 33). Renear rejects the claim of simplicity in noncritical editing projects, which he writes are the most common library-led projects. He instead argues that literal transcription – the process of creating "a literal representation of the linguistic text of a particular document" or, the focus on a given "author's linguistic achievements," rather than "the author's linguistic intentions" (which so preoccupies critical editors) – underlies all noncritical editing, and that participating in this type of transcription, and by extension non-critical editing projects, involves a significant amount of problems that would interest textual scholars (2001, p. 37).

Eight years later, John Lavagnino (2009) published an article entitled "Access" in *Literary and Linguistic Computing*, in which he reflected on the lack of digital editions and the wealth of digital libraries springing up in memory institutions and academic publishers' online catalogues. In his article, Lavagnino claimed that the work in digital libraries could largely be performed by "programmers, typists, and clerks with no special expertise in the subject area," and that digital libraries "can be created by workers who have no special knowledge of the material, and indeed may not know the language it is written in" (p. 64). He also outlined a distinction between digital scholarly editions and digital libraries that echoes Renear's discussion of media conversion versus scholarly activities: in digital libraries, Lavagnino tells us, tasks are carried out by non-scholars, which he calls "workers," and they are done "quickly and inexpensively, and inevitably there are errors," whereas

digital editions are created by scholars, and they are “expensive, technically difficult, and time-consuming” (Lavagnino, 2009, p. 64). Lavagnino further concludes that “for our purposes as textual scholars, digital editions are more interesting.” From Renear and Lavagnino’s examples, we can draw some interesting observations about library involvement in digital editing projects from the point of view offered by textual scholars. They present a distinction between library digitization and digital scholarly editing, both in terms of the workflow and the scholarly merit of the two enterprises. Renear argues that libraries need to stop thinking of their work simply as media conversion, and that textual scholars need to stop undervaluing noncritical editing because it will be the most prolific type of editing in the coming twenty years. In contrast, Lavagnino tells us that while there is indeed a proliferation of digital library work, it is still the digital scholarly edition that should interest scholarly editors, because it has more textual complexity to offer. However, the maturation of digital publishing in the past fifteen years has opened up the field of scholarship for new players, and renewed consideration of already existing ones. Are Renear and Lavagnino’s distinctions between library digitization and digital scholarly editing accurate descriptions, or are new kinds of projects challenging these assumptions? Are we seeing an increasing amount of cooperation and blending of library digitization and digital scholarly editing practices? And if so, what does this landscape of cooperation, collaboration, and division of labor, competence, and responsibility look like? To answer these questions, we will examine the activities of two under-researched Swedish examples that actively cope with these new challenges, and where – arguably – the lines between library digitization and digital scholarly editing are blurred.

Sweden presents an interesting case for our purposes: although there is a burgeoning Swedish academic discourse around digital editing, very little is written in English or Swedish about projects that blur the lines between traditional editing projects and other endeavours. On the one hand, we will investigate an external collaboration between Litteraturbanken (The Swedish Literature Bank – a digital publishing project that produces authoritative high-quality digital texts of Swedish literature) and the staff of Gothenburg University Library (the Litteraturbanken team’s primary collaborators). On the other hand, we will consider an internal collaboration at Uppsala University Library, which produces high-quality digital representations of Swedish primary textual sources that are published on ALVIN, a digital platform that Uppsala University Library manages. While neither

the Litteraturbanken project nor Uppsala University Library's output on ALVIN could, by a narrow definition, be considered a digital scholarly edition, the outputs and aims share some similarities with scholarly editions, and their respective staff are participating in the development, display, and preservation of digital representations of Swedish literary works while using elements of both library digitization and digital scholarly editing practices. The aim of this study is to investigate where and how the collaborative workflows and outputs of Litteraturbanken and Uppsala University Library might be subtly reframing the boundaries between these practices.

2. The Scandinavian (and Swedish) Context

In the Scandinavian countries, scholarly editing is performed through a network of scholars working within a small handful of societies, academic departments, and in some instances, libraries. These include the national libraries of Sweden, Norway, Finland, and Denmark, as well as the Arnamagnaeian Institute, a subgroup of the Department of Nordic Studies and Linguistics at the University of Copenhagen, the Nordic Network for Textual Criticism,⁵ the Society of Swedish Literature in Finland, and the Swedish Society for Belles-Lettres.⁶ Traditionally, textual scholars in the Scandinavian countries have created digital critical editions of major authors' works; for example the Søren Kierkegaard edition in Denmark,⁷ the Henrik Ibsen edition in Norway,⁸ the Zacharias Topelius edition in Finland,⁹ and the Selma Lagerlöf edition in Sweden¹⁰ (Dahlström & Ore, 2013; Ore, 2015). While Denmark, Norway, and Sweden each have their own distinct set of canonical authors, the three Scandinavian countries, along with the Swedish-speaking area of Finland, share a common history of linguistic, social, and literary ties, and a common history and practice of digital text editing. Since 2015, the Digital Humanities in the Nordic Countries¹¹ network (DHN) has started to bring together members of editing societies and centers, and, to a larger extent, digital humanities scholars outside of these editing communities, for an annual conference to discuss ideas and potentially to build research infrastructures and project partnerships around digital editing and digital scholarship at large. In the Swedish context, three research networks of considerable influence in the digital humanities are HUMLAB at Umeå University, the Centre for Digital Humanities at the University of Gothenburg, and the Humanities Lab at Lund University. Although these research networks do not include digital scholarly editing as part of their body of work, nor any digitization of cultural

heritage materials, members of these centers are regularly involved in digital textual scholarship and interact closely with the staff of Litteraturbanken, Gothenburg University Library, and Uppsala University Library. Digital scholarly editing work takes shape in different ways and in different research environments in Sweden. The decentralized ecosystem of collaborative digital work in the Scandinavian countries, and particularly in Sweden, involves framing libraries as digital service providers and, far less frequently, as equal research partners in the development of digital scholarly editing projects.

2.1. Litteraturbanken

Litteraturbanken (The Swedish Literature Bank) is a web-based project designed for producing, collecting and displaying digital reproductions of Swedish language literary works and is one of only a handful of projects or societies focused on the digital dissemination of Swedish literature. It is an important resource for digital editions of well- and lesser-known authors in the Swedish literary canon, and the collection continues to expand (Dahlström & Dillen, 2017). Regarding the Swedish-Finnish literary and linguistic connection, Espen Ore writes, “although literature written in Swedish in Finland is published by Finnish institutions and literature from Sweden by Swedish institutions, Litteraturbanken [...] acts as a repository for digital critical editions in Swedish from both countries” (Ore, 2015, p. 65).

Based at Gothenburg University, Litteraturbanken is governed by a board including members from the Swedish Academy, the National Library of Sweden, the Royal Swedish Academy of Letters, History and Antiquities, Språkbanken (The Swedish Language Bank) at the University of Gothenburg, the Swedish Society of Belles Lettres and the Society of Swedish Literature in Finland.¹² The project has been operational since 2004, and was initially funded by the Riksbanken Jubileumsfond (Foundation for Humanities and Social Sciences). Since 2009, Litteraturbanken has been funded by the Swedish Academy of Letters, History and Antiquities, and receives additional support from the National Library of Sweden and the Society of Swedish Literature in Finland.¹³ The project team includes eight editorial staff and three additional people providing technical support for the project. Members of the editorial team are experienced “literary, linguistic, and textual scholars,” and therefore bring a critical eye to the transcription and presentation of the texts offered on the site (Dahlström & Dillen, 2017). While the relationship between

Litteraturbanken staff and university libraries extends beyond Gothenburg University to other universities in Sweden, the project team's proximity to the Gothenburg University Library means that ties are particularly close and materials are (relatively) easier to view and access, as compared to their relationship with other major university libraries such as Lund, Umeå, and Uppsala. At the University, Litteraturbanken staff work closely with the Språkbanken team, the Department of Literature, as well as the Manuscripts Department and the Digital Services Department at the University Library.

As of December 2019, Litteraturbanken comprises 4,200 separate works by 2,163 authors. The site contains 1,064 ePub files, 265,687 pages of e-texts, and 645,834 digital facsimiles ('Litteraturbanken innehåller just nu,' 2019). These figures, while considerable, do not take into account the sizable collections connected to Litteraturbanken, including the Svenskt Översättarlexikon (The Swedish Translator's Dictionary), a bibliographical resource about translations of Swedish heritage works; Skolan (Litteraturbanken's collection of tools and resources specifically designed for classroom use); or Dramawebben (Swedish Drama on the Web). Litteraturbanken staff publish digital editions of Swedish classics after subjecting them to a series of critical interventions. It is important to note that Litteraturbanken also houses several finished and on-going scholarly editing projects, of which the Lagerlöfarkivet (The Selma Lagerlöf Text Archive) is one notable example. These text-based digital objects come from the Swedish literary canon and, where possible due to copyright, the site offers download options, as well as ancillary materials to provide contexts to the collections and sub-projects. These materials include a sound archive of Swedish poetry read on Swedish Radio and an extensive collection of essays written by external researchers and the Litteraturbanken project team. The topics of these essays range from introductions to the texts, the history of genres of Swedish literature, biographical sketches about specific Swedish authors, contextual essays about historical events occurring around the publication of key texts, and about events mentioned in the literature itself, as well as a large number of technical essays about translation, bibliography, and paleography, using examples of manuscripts throughout different eras in Swedish literature.

Though the Litteraturbanken staff define the scope of the project as the production of a repository of texts in the Swedish language, parts of Litteraturbanken can also be viewed as what Unsworth (2000), Palmer (2004), and Schreibman (2013) have called a thematic research collection. As Schreibman writes,

“[thematic research collections] are electronic, contain heterogeneous data types, are extensive but thematically coherent, and are structured but open-ended. They are designed to support research, are written by at least one if not many authors, are interdisciplinary, and are collections of digital primary resources.” Litteraturbanken ticks all of these boxes: it provides a human and machine-readable collection of text-based digital objects freely available for research and teaching purposes. Essentially, ‘Skolan,’ the area of Litteraturbanken developed especially for classroom use, operates as a scholarly publishing and teaching platform for a range of topics related to Swedish literature.

2.2. Uppsala University Library

Founded in 1620, Uppsala University Library has existed in different forms and locations for over 400 years and was the first University Library in Sweden. The Carolina Rediviva building has been the university’s central library location since 1842, and its physical collections include over 700 distinct personal Swedish archives made up of letters, diaries, drafts of literary works, as well as medieval and early modern manuscripts, maps, early printed books, engravings, lithographs, postcards, photographs, drawings, music scores, pamphlets and other cultural heritage ephemera (Uppsala University Library, 2018).¹⁴ Further physical and digital collections are spread across the twelve subject libraries found throughout Uppsala, and one in Visby. Following many other 21st century library innovators, Uppsala University Library provides a Makerspace for 3D printing, creating technical prototypes, and learning about electronics.¹⁵ The library also has two digital labs for “data management, visualization and media production” (Uppsala University Library, 2019).¹⁶ In the library’s internal cultural heritage photographic studio, trained photographers and image technicians submit materials from the library’s collections to the digitization workflow process (this workflow is explained in detail in Section 3.2. below). The Library employs 196 staff, 100 of whom are librarians. Among these employees are also textual scholars with PhDs who have edited their own scholarly editions as well as having worked collaboratively on other scholars’ editions. Uppsala University Library staff provide technical support, digital infrastructure, and extensive historical and literary context for on-site projects such as the Codex Argenteus project (Sweden’s most well-known book and one of the world’s most valuable extant Gothic Bible manuscripts),¹⁷ the Stammbuch project (a transcription and commentary project for a group of 150 *alba amicorum*, or

small notebooks carried by mostly German-speaking university graduates in the 18th and 19th centuries),¹⁸ the Linnean Correspondence Project (a collection of letters to and from renowned 18th century naturalist Carl Linnaeus),¹⁹ and many others, thus adding enriched digital collections grounded in textual scholarship to the library's holdings.

These items are catalogued, and in many cases digitized, for display on ALVIN, a platform for digital cultural heritage led by Uppsala University Library. The platform is overseen by a consortium that includes two other universities: Gothenburg University and Lund University. Contributing institutions include specialist libraries and archives across Sweden, and their cultural works are displayed on ALVIN. Aside from providing access to many digital projects across a range of subjects and historic periods, ALVIN also serves as an online catalogue of items to be – or in the process of being – digitized by the Uppsala University Library and other member institutions. As such, ALVIN boasts a wealth of material across the media spectrum which can be downloaded under a variety of licenses for use and reuse. To date (December 2019), ALVIN contains 160,244 freely displayed digital items. Of these, 88,968 are text-based. From the overall collection, Uppsala University Library has contributed 85,550 items, of which 54,516 are texts, 44,850 of which are freely available online.

The digital collections disseminated on ALVIN and the staff's expertise on textual scholarship gives Uppsala University Library good insight and participation in the Swedish scholarly editing community. Through the receipt and display of digitized content from other institutions on ALVIN, which is maintained on site at Uppsala, the library staff also have considerable knowledge of the landscape of Scandinavian digital text-based research at large. The close relationship that Uppsala University Library staff have to the management and direction of the ALVIN portal was a strong theme in the interviews with Uppsala staff, and indeed ALVIN has been the focus of the librarians' many external presentations both in Sweden and abroad about Swedish library digitization and digital publishing practices.

2.3. Method for Data Collection

To better understand these collaborations and how they are conditioning digital outputs, semi-structured interviews were carried out in English with

three staff members at Litteraturbanken, one staff member from Gothenburg University Library, and five staff members of Uppsala University Library. The interviewees include a professor of literature, a head librarian, two scholars working in libraries on cataloguing and internal editing projects, a digitization coordinator, two cultural heritage photographers, and two editors working on external digital projects. In all cases, the interviewees have been working in their respective positions since the inception of their projects, and/or they have been deeply involved in their institutions' digitization, conservation, and bibliographic activities. As such, they are considered by their peers to be experts in their respective academic and technical work.

The interviews ranged from twenty minutes in length to one hour, and all interviews were audio-recorded, save one, which was conducted via email. Each interviewee was informed about the intended use for the recordings and correspondence in this article, each was offered a copy of the audio recording (when applicable) if they so desired, and each interviewee consented to the recording of the interview before it began. The site visits and initial interviews were carried out in October of 2017 and the follow-up email conversations and by-distance interviews were carried out via Skype and phone in February, March, October, and November 2018. Interviewees have been anonymized and designated a number and letter combination to differentiate them from one another. The Uppsala University Library staff are designated as UUL1, UUL2, UUL3, UUL4, and UUL5, respectively. The Litteraturbanken staff are designated as LB1, LB2, and LB3, respectively. The Gothenburg University Library staff member is designated as GUL1.

3. Diverse Practices, Common Aims

With a firm grounding about the makeup and output of the two Swedish research environments and the specific respondents from Litteraturbanken, Gothenburg University Library, and Uppsala University Library, we can now investigate the major themes that came up during the interviews. First, we delineate the internal digitization workflows of Uppsala University Library and the external digitization workflow between Litteraturbanken and Gothenburg University Library and the tensions surrounding them. These are explained in detail with interview extracts from LB1, LB2, LB3, GUL1, UUL2, UUL3, UUL4, and UUL5. Following that, the editing practices of

the two cases are elaborated in Section 3.2 using information gathered from UUL1, UUL3, UUL4, and LB1, LB2, LB3, and GUL1.

3.1. Digitization Workflows

3.1.1. *Uppsala University Library Digitization Workflow*

While Litteraturbanken relies extensively on external collaborations with staff at Gothenburg University Library for the scanning and OCR (Optical Character Recognition) of source texts, Uppsala University Library has an internal digitization studio where these digitization activities take place. The studio has Canon and Hasselblad cameras, flatbed scanners, and a Treventus book robot. After an extensive internal project to, as UUL2 puts it, “try and find a workflow that fits for us,” the library is now in its third year of using a batch planning method, wherein a Digitization Coordinator uses internal library web pages to group items to be digitized up to a year in advance. As UUL2 notes, this Coordinator

“tries to plan those things so that we [in the digitization studio] don’t only have big maps to digitize, for example, because we have different workstations for different camera solutions. So we need different size of the material or different type of material so we can be most efficient. So me and this person we are doing this batch planning together. We have a lot of interaction [among staff] internally but it’s never informal. It has to go through the right channels. We have the workflow that goes through the whole library from the librarians through the conservation unit through us. It’s well planned” (UUL2, 2018).

The Library’s digitization studio has seven separate workstations, and the selection process for the items to be digitized is largely based on three criteria: funding, fragility, and circulation. Regarding financing and selection, UUL2 notes that a researcher who uses the Library will often find an item or set of items in the Library’s collections and then attempt to secure funding for the digitization. The other instance UUL2 describes where this might occur is when a librarian secures external funding to pay for digitization and/or the time to write extensive bibliographic metadata for a collection that is not a current topic of research, and therefore could benefit from the

exposure that digital dissemination through ALVIN might bring. According to UUL2 these types of externally-funded research projects make up about 80% of the digitization performed by the studio. The other 20% are projects suggested internally by librarians, conservators and other staff to be digitized and put out in ALVIN due to fragility and/or frequent circulation of materials. For example, UUL2 says “We have a glass plate collection that’s starting to vanish, and because it’s going to disappear in the near future, we need to digitize it before it’s gone” (UUL2, 2018). In this case, the Library has an obligation to perform digitization as a means of preservation. The last reason UUL2 mentions for digitization is circulation, i.e. ‘material that is used very often in the reading room’ (UUL2, 2018).

Respondent UUL5 (2018) noted that the ‘the physical condition of the material is also crucial, for example, it may have a form that makes it difficult to make available in our reading rooms or it is about to break down.’ When asked about the digitization of fragile materials, and the amount of interaction the photographers and image technicians have with the conservators in the Library, UUL2 states:

“If the librarians see the particular kinds of materials are fragile, the material goes through the conservation department, and then to us. And sometimes if [conservation] misses something then we send it over to them. And they [the conservators] have given us training [in conservation] so it is easier for us to see what we can do and what we can’t do[...]. We communicate with the conservation unit regularly and they are in the loop [of the batch planning] as well because they are in the workflow. And they can actually be in the workflow anytime and anywhere, depending on when we realize that a material is fragile and/or the librarians see it” (UUL2, 2018).

In that same vein, the digitization studio staff frequently have to rethink their approach to projects based on the objects being digitized, as UUL2 describes below:

“For instance, the [Treventus] robot; we thought the Uppsala dissertations [from the 17th century] should work on [that], and we tried and we tried but no, it didn’t work. So we moved those to the ordinary [flatbed] scanners. It happens all the time. We have to [be agile], because...we try to reach the same level of quality on any piece of equipment – even

though I think the cameras are a little higher [quality]. So in one project, a manuscript can go under the cameras or sometimes the scanners as well. It depends on the shape and fragility of the object" (UUL2, 2018).

Even when funding has been secured for items and they have been cleared by the librarians and the conservators, there are occasionally instances when those items have been placed on a number of different photographic setups and it's not possible to find an appropriate placement that won't damage the item in some way. At Uppsala University Library, the problem has mostly occurred with tight bindings of manuscripts that cannot lie flat, or be opened to a great enough degree that a single page can be photographed. In that case, conservators and librarians are again consulted by the digitization studio to discuss if, and how, to proceed. In some instances, conservators are then tasked with creating manuscript supports that will allow the binding to be loosened without damaging it.

Currently, the digitization studio at Uppsala University Library has one photographer, one assistant, and three image technicians who rotate across the seven work stations. The image technicians "do everything from start to finish, so to speak. They do image capture, and the editing of the files and put some metadata on the image files" (UUL2, 2018). When asked what the difference was between image technicians and photographers, UUL2 said "Yeah it is unclear to us [in the digitization studio]. We are doing the same things. So there's no difference. I think of any of them [interchangeably] as photographers or image technicians." The assistant helps to place materials on the workstations and does some quality control checks for the image files and the metadata, however the extensive, in-depth bibliographical metadata is added into the ALVIN platform by the librarians and the conservators.

The quality control in the Uppsala University Library digitization studio consists of three concrete steps and one optional fourth step: first, after taking the images of a given manuscript in a batch, these images are checked by the team in Adobe Photoshop and Adobe Bridge for blurriness, and then checked again to make sure that the correct number of pages for a given manuscript are present in the batch. Next, the team checks for correct metadata and pagination attached to each image (e.g., cover, folio, recto, verso, back cover). Finally, the images can be checked one-by-one in ALVIN to make sure that the correct images are uploaded with the correct corresponding metadata. Respondent UUL2 (2018) adds that the librarians "sometimes [also] check the

pictures [in ALVIN]. I don't know why because I think it's enough that we do it [...] we like to see if it looks good [in ALVIN]. We're not supposed to do it, but sometimes we just do it anyway to be sure." This *ad hoc* approach to checking the images in ALVIN is also due, UUL2 says, to the sheer volume of ongoing projects, and because the first three quality control checks are meant to find the errors that would be present in ALVIN once the images have been digitally published. What the above chain of processes shows, however, is the importance of knowing the steps in the workflow of digitization to better understand where industry standards and individual experts' subjectivity are in constant interplay.

The access files of the images published by the digitization studio on ALVIN – which in the current batches consist mostly of manuscripts and the old dissertations – are TIFF files at 400 ppi (pixels per inch), while anything under A5 size is offered in 800 ppi. There are also downloadable PDFs offered at 200 ppi.²⁰ Preservation files sustained by the digitization studio team are also TIFFs at 400 ppi. UUL2 noted that OCR is performed using ABBYY, a service generating digital files that have been subjected to OCR (which is also used by the Digital Services department at Gothenburg University Library), and LIMB, an image processing software that also offers OCR encoding on every manuscript where it is possible to get a legible result.²¹ The difficulty in the current workflow, UUL2 argues, is that

“it takes too long to check the OCR [for older scripts]. If you're going to check the OCR you probably need to know about whatever is written. You need to know what counts as good. I think we [in the digitization studio] are not the people to correct that because we don't know” (UUL2, 2018).

And, as UUL3 argued, there simply isn't the time in a librarian's current schedule to proofread the OCR for more complex manuscripts with difficult scripts. One thing that UUL2 noted could be made easier in the digitization workflow is to provide an option for automatically uploading images directly onto the ALVIN platform. Respondent UUL2 further lamented that they “think and hope that we can hire some more persons [...] because I think the university and the library wants to fill up ALVIN faster than we can do at the moment. So we need more personnel” (UUL2, 2018).

When asked whether UUL2 considered the imaging performed in the digitization studio to be critical work, they stressed the number of

interventions by the team in terms of looking at and re-engineering the physical set up for different materials, and the number of quality controls described above:

“The standard is higher with this kind of image capture that we are doing. Both in terms of the quality of the files and the handling of the material. Because we have these calibrated scanners and the [computer] screens are calibrated. And we do a lot of measuring so that everything looks nice in the end” (UUL2, 2018).

This quote demonstrates the importance of how photographers enforce limits on their intervention in the work at hand based on what they think is appropriate for them (versus a scholar) to work on. The calibration to which UUL2 refers is the manual adjustment of a computer screen to accurately represent colours that have been captured in the imaging process. As UUL2 says above, the scanners are also calibrated to accurately capture these colours. Thus, there are two quality control checks in the hardware set-up (computer screens and scanners) that are then checked (as described in the paragraph above) using software. The photography team uses colour cards to ensure that colour accuracy is present in the images – meaning that if you have the image of a manuscript page on your computer screen, and you have the physical manuscript next to you with the same lighting conditions in which it was photographed, the digital and the physical page should look as similar to one another as current image processing software and colour cards allow. The measuring in UUL2’s quote above also refers to the 1:1 scale to which images are captured in the studio, an industry standard for cultural heritage photographers and a useful addition for researchers interested in both the textuality and materiality of a given object. This ‘life size’ scale means that the image is captured with a clarity relevant to the exact size of the object being digitized, and if the digital image were printed at the same size as the object itself, the sharpness and colour of the two items – one a digital image, the other a physical item – would be as close to identical as current photographic lenses and image processing software allow.

3.1.2. Litteraturbanken and Gothenburg University Library Digitization Workflow

Unlike the digitization studio in Uppsala University Library, Gothenburg University Library does not have a photographic set up, which GUL1 called

“a conscious choice, because if you have very complicated cameras, and you have very complicated settings and lighting, and so forth, it’s hard to replace people and it takes a long time to learn. We’ve been talking about getting a station, but for now it’s already a bit crowded in our physical room” (GUL1, 2018).

Instead, they have a series of flatbed scanners, as well as the same Treventus book robot as Uppsala University Library, which GUL1 (2018) said was “a cooperation between Lund, Uppsala, Gothenburg, the National Library, and Umeå in 2011 when all of us bought a Treventus robot.” When discussing critical interventions in the digitization process, GUL1 noted that there is a seeming misunderstanding about the skills needed to work on different types of digitization equipment, with scanners being misrepresented by other digitization professionals: “you get the same problem with a book robot as you do with a complicated camera. You can’t just take a person and put it in front of the robot, it takes a month before you are really qualified and can manage the robot. But the robot was so expensive, so we have to use it!”

When asked to describe critical decisions made during the digitization workflow, GUL1 said that

“most of the choices are made by the coordinator for the materials. He receives the orders from the researchers [...] and first he has to see if the book is free [...] and if it is catalogued. Because we do not want to add any bibliographic data. Then the book comes to us and we have to see if it’s possible to digitize it. If it’s tightly bound or strange in any other way, it could be that we can’t scan it with a decent result. But mostly it’s okay and then it goes down to digitization. They, in their turn, do the final judging if it’s possible or not to do the book. We also OCR everything that’s not a manuscript and not [in] Gothic [script], and if we see that we can scan the book but the OCR will be bad, then we will not scan the book, because the OCR is so important, so we do not want to spend two hours digitizing a book and get lousy OCR” (GUL1, 2018).

When asked how the determination about whether OCR will be substandard is made, GUL1 responded:

“it’s experience. We’ve been OCR-ing books now for six or seven years. We know when a book looks in a certain way, say if it’s tightly bound or

anything like that, we know that it will be impossible to get a scan that will have good OCR" (GUL1, 2018).

This is another example of experience allowing photographers to make critical judgments about how (and if) to approach their digitization work. However, GUL1 noted that there is definitely a back and forth that occurs between the researcher requesting the images and the digitization team. First, the team, through the coordinator, asks the researcher how the scans will be used. If the researcher replies that the OCR is the/a central feature for the need to scan the book, the unit will urge against this, citing quality control, but will not rule it out. Respondent GUL1 (2018) argued that the reason for urging against this is not only because of professional interest in the quality, but also, implicitly, the reputation of the unit: "we have to publish everything that we scan. And we really, really, do not want to publish bad scans [...] it happens sometimes. Not very often." They further cited copyright as the other major reason for turning down an order: "sometimes people do not know how many years an author has to be dead for us to be able to scan their books" (GUL1, 2018).

With regard to fragility of materials, GUL1 noted that

"we have a deal with the [book fetchers] working in the library. If they think it looks fragile then they contact the conservators and ask them what they should do. Sometimes they say "scan it first and we will fix it afterwards," and sometimes they will fix it first and then we scan it. But we do not take those decisions" (GUL1, 2018).

When asked if the Digital Services department frequently works in close proximity with the conservators in the library so that fragility of materials can be assessed, or training on how to handle material can be offered, GUL1 (2018) said that "it's a bit difficult because we're in a completely different building. So we can't just go to them and ask about something. Sometimes our [scanner] operators ask if they really should be scanning something, and then we contact [the conservators] again."

Much like the close relationship that Litteraturbanken has developed with the Department of Manuscripts in the Library, GUL1 notes that the Digital Services department has also developed close ties with the project, and that this professional relationship started in about 2010. The Digital Services

department have a different agreement with the Litteraturbanken team than with other researchers. For example, researchers and students affiliated with Gothenburg University receive their scans and imaging for free because that work is subsidized by the University. However, even though the Litteraturbanken project employs staff who also work at Gothenburg University, the project itself is not funded by the University, rather by the Swedish Academy and the National Library of Sweden, and therefore Litteraturbanken pays for their imaging and scans of their requested materials.

Regarding the closeness of this relationship, GUL1 (2018) points to the ways the Digital Services Department and the Litteraturbanken staff have agreed on structuring the requests for images: "Litteraturbanken is a little more fussy than the others [laughter]. The other [researchers] want an OCR'd PDF and that's okay. But the Litteraturbanken want things a different way than most others." The workflow therefore adapts to accommodate the Litteraturbanken team, in the sense that Digital Services staff have agreed with Litteraturbanken staff, and in particular with LB1, to use keywords for the imaging request form. In the case that LB1 marks the order form with 'OCR,' then the staff use the book robot, which is "not as nice as when we take it with the other scanners (GUL1, 2018)." If, however, LB1 marks the order form with the word 'environment,' then GUL1 and the staff in the Digital Services Department at Gothenburg University Library know that it is the facsimile that is the most important part of the imaging process. It is a signal which tells the staff at Digital Services to use a different piece of equipment than the Treventus Robot, as Litteraturbanken staff may be interested in marginalia, or other features specific to the document itself rather than the text. This in turn changes the workflow. The development of a common vocabulary to denote how the workflow can continue is a sign of deeper collaboration and mutual understanding, and how editors can adapt their work to meet the needs of the digitization team. Digitization staff can then make an assessment as to which scanner suits the materials best, and then work on image capture proceeds: "It has to do with, say an overlap [of text] in the middle [of a book], you can capture that with a flatbed, you can't do that with a robot (GUL1, 2018)." Further changes to the workflow include sending not only a higher-quality access file (PDF) than to other projects (from 200 ppi to 300 ppi), but also the preservation file (TIFF) that the library keeps for its own digital preservation. Further, the Digital Services Department also provides XML files created by the ABBYY Recognition Server for respondent LB2 to process. Depending on the project,

the XML transcription is proofread by student workers and checked again by editorial team members from Litteraturbanken.

The relationship between Gothenburg University Library's Digital Services Department and Litteraturbanken is not without its tensions regarding funding and volume, as GUL1 states below:

“sometimes it can be difficult to keep up with the volume of orders from Litteraturbanken, because they order so many books, and we also are a part, and *want* to be part, of other projects, and we have the [Gothenburg University] researchers and student orders. We have to split our time up into percentages, which means we are sometimes not able to get [Litteraturbanken] the books as fast as they might want. At the same time, that's a way for us to show the library that we need more resources so that we can meet their requests” (GUL1, 2018).

Gothenburg University Library are thus experiencing a similar frustration as noted above by Uppsala University Library staff – that work far exceeds the time and personnel resources available.

3.2. Competing Conceptions of Editorial Work

3.2.1. *Litteraturbanken*

The staff of Litteraturbanken carefully select source documents representing Swedish literary works, and texts of these works are then subjected to OCR internally or by Gothenburg University Library staff. The Litteraturbanken editorial team also occasionally manually transcribe documents so that they will be machine-readable files. All of the transcription texts of digital editions on Litteraturbanken have been encoded using TEI-XML and rigorously checked for transcription errors. This proofreading is often performed by student workers under the supervision of two permanent members of Litteraturbanken staff. As described above in Section 3.1, the scanning and photography of the books is mainly performed by Gothenburg University Library staff in the Digital Services Department that work with Litteraturbanken to provide the printed books and manuscripts; however, Litteraturbanken staff perform some of their own scanning of printed books as well.

A guiding theme to the interviews with members of the Litteraturbanken and Gothenburg University Library team was their collaborative relationship – and how this affects the project’s editorial output. When asked to describe the relationship that Litteraturbanken has with libraries, respondent LB1 (2017) noted that Litteraturbanken collaborates “with a number of libraries throughout Sweden,” and that, with regard to Gothenburg University Library, critical (if informal) editorial work is happening in the library environment. This view was not universally held among the Litteraturbanken team, however. When asked whether any aspects of editing work were happening in Gothenburg University Library, LB2 (2017) responded “bibliography, maybe, but I can’t think of any editing.” This distinction is an important one: Hjørland (2007) has espoused the importance of reconsidering ‘the bibliographic paradigm,’ arguing that doing so would reveal that the real issue is not that bibliography (and in particular analytical bibliography, which considers the history and transmission of a physical book) is not scholarship, but rather that bibliography is not *understood* to be scholarship, and therefore is not recognized as scholarship. This would suggest that the misunderstanding of the bibliographic paradigm and the misconception of what constitutes editorial work in a library environment may be intimately entwined, or indeed, one and the same problem. With the renewed understanding that analytical bibliography traces the history of a text and its transmission in physical form, it is important to place bibliographical work as a key part of editorial work. This point was illustrated by LB1 when discussing the expertise present in Gothenburg University Library:

“[Staff member at the library] can point us in the direction of certain editions, certain copies that are special or interesting to us, if it’s been annotated [staff member] knows about this and can say “you need to take this copy and not that copy because this one has some interesting annotations that could provide a bonus to your facsimile,” and [staff member] has a *deep* knowledge of the manuscripts, of the letters, of everything in the holdings. I mean, [staff member] *is* the Department of Manuscripts” (LB1, 2017).

Such deep knowledge may have been gained through many years’ exposure and familiarity with the collections, but it is also an example of how librarians’ knowledge conditions the knowledge production performed in library-dependent digital projects; a practice that is not understood well enough by textual scholars or the wider ecosystem of digital scholars. Bibliographic

familiarity from staff members at Gothenburg University Library points the Litteraturbanken team in the direction of manuscripts and printed books that would be particularly interesting for editorial reasons, and therefore results in the further exposure of that manuscript or printed book to an editorial gaze.

Respondent LB1 (2017) went on to argue that Litteraturbanken is 'completely' dependent on Gothenburg University Library, and that without the staff there, virtually none of Litteraturbanken's work would be possible. Respondent LB3 (2017) concurred, stating that "We know the people there very well and we can discuss technicalities [...] in a very good way." When Litteraturbanken began to drastically scale up their material digitization orders, Gothenburg University Library's Digital Services Department had to outsource some digitization to other universities as a result, and LB3 (2017) stated that "[t]hey set up a collaboration with other university libraries and Gothenburg University Library has been the center of this collaboration and our main contact throughout." Likewise, as Litteraturbanken's orders represent a significant portion of the digitization activities of Gothenburg University Library's Digital Services Department, the relationship is a symbiotic one: GUL1 (2018) noted "if it were not for Litteraturbanken, we would not be this many people in our department," and added that Litteraturbanken's orders helped the unit to "motivate our existence, up until 2014, when digitization became hot!"

The close collaboration between Gothenburg University Library and the Litteraturbanken team described above has also led to the development of smaller, micro digitization collaborations on one or – in some instances – a handful of manuscripts that are of particular interest to both parties. That, Litteraturbanken respondents state, is where it is possible to verge on what would traditionally be described as a critical edition, "because you do some sort of editorial work" (LB1, 2017). According to LB3 and LB1, this included emending misspelled words in printed texts, and reconstructing texts from multiple manuscripts. When asked whether that editorial work was being performed by Litteraturbanken or library staff, Litteraturbanken respondents confirmed that it was largely on the Litteraturbanken side, but stated that "[the library staff] provide the materials, they provide the digitization, and they provide some sort of knowledge framework which Litteraturbanken can access, because obviously they have a greater knowledge of the holdings which Litteraturbanken can use" (LB1, 2017). These comments give rise

to a sense that the understanding of what exactly constitutes editorial work is fluid and nebulous, and entirely dependent on the project at hand. For example, LB1 (2017) mentioned working with Gothenburg University Library staff who are very knowledgeable on specific authors and 'dipping into' their knowledge and expertise was a way of creating miniature collections within Litteraturbanken. Indeed, LB3 (2018) confirmed this by saying that

“when we talk to the one [in Gothenburg University Library] who is responsible for manuscripts and very very rare books [staff member] really knows very much, and with [staff member] we have discussed what kinds of texts we might find and how to do things with the corpora [...]. [staff member] is a true asset.”

The logic behind categorizing this editorial work as being from the Litteraturbanken side seems to rest on who took the initiative for a project: as it is largely the Litteraturbanken team's idea to pursue a project, anything that comes from a given library (in this case Gothenburg University Library) is considered an aid to Litteraturbanken's critical work. However, both Litteraturbanken staff and Gothenburg University Library staff collaborate together to discuss and decide upon the best source copy of a given text from among several candidates that differ in historical textual versions, illustrations, physical condition, and these material components' collective ability to convey the meaning of the overall work. While LB3 went on to say that this type of editorial work makes up a small amount of the overall scope of Litteraturbanken's offerings, they noted that the help of this staff member at Gothenburg University Library to find not only interesting and relevant manuscripts, but also unpublished materials such as letters, greatly enriches the content of what is being produced and digitally published on Litteraturbanken.

As Litteraturbanken is a multimodal resource with elements for researchers, teachers, and students alike, different elements of the site are useful for these different user groups (Dahlström & Dillen, 2017). Textual scholars might refer to Litteraturbanken as a thematic research collection or digital text collection rather than a digital scholarly edition or a digital library (Dahlström & Dillen, 2017; Henny & Neuber, 2017), but there are similar aspects of work leading to a digital scholarly edition (and indeed a digital library) present in the process of creation, dissemination, and preservation at Litteraturbanken. As with digital scholarly editions, the digital scanning of source materials is requested

from and performed by staff at a library, and the project's workflow includes OCR processing, advanced text encoding on the basis of an agreed-to schema, and finally a proofreading process. In addition, the Litteraturbanken staff use paratexts to introduce the individual works in their corpus, and to explain their significance and reception; more key elements in the scholarly edition. All this implies that Litteraturbanken team members require a skill set that is, in this regard, quite similar to that required for the development of digital scholarly editions.

3.2.2. *Uppsala University Library*

The interviewees from Uppsala University Library had a different experience with regard to editorial work happening in the library. Interviewee UUL1, for example, stated that editorial work was indeed occurring, with for example the Stammbuch project (described briefly in Section 2.2 above):

“a lot of digitizing projects today is also a question of adding metadata which makes it usable in research contexts or actually as research, for example this Stammbuch project I consider as a sort of edition, you make the texts accessible directly on the Internet, but you also add metadata and so on to be able to work with the materials. It's a sort of digitized critical edition” (UUL1, 2017).

Uppsala University Library has the largest collection of *alba amicorum* – some 150 separate books – in Sweden. The Stammbuch project sets out to provide commentary for these very specific types of material objects. The project began with respondent UUL4 receiving a grant for funding from the Riksbankens Jubileumsfond, a Swedish funding organization, in the autumn of 2013. Although UUL4 is the person working on the Stammbuch project, they are not a library staff member. Instead, they are an academic affiliated with an external faculty at Uppsala University who is working on the project part-time in the university library. Although UUL4 is not a permanent member of staff, he has been trained as a librarian, and “in the Autumn of 2012, held a five-week internship in the Uppsala University Library as part of this training” (UUL4, 2017). As a result, UUL4 already had a relationship with staff there, and “together with a colleague from Germany, ... initiated the Stammbuch project by talking with the university library” (UUL4, 2018). But the project work needed to include digitization and transcription of the

alba amicorum, and because of the wait time for the funding, and then the batch planning of the digitization, it did not start until 2015. Respondent UUL4 (2017) said that “the digitization is now completed,” and that cataloguing of the *alba amicorum* “at a ground level” has also been finished. Following that, respondent UUL4 (2017) began working on “an in-depth digital catalogue” of the physical and textual characteristics of the *alba amicorum* in the Stammbuch project. As respondent UUL4 (2017) said, “there are no plans of which I know in the library to continue this work with the in-depth cataloguization [sic] of the *alba amicorum*, and I don’t have a fixed position at the library.” For this reason, respondent UUL4 (2017) states, “I hope to continue the in-depth cataloguing beside my [full-time] work.” This situation harkens back to Terras’ (2015) assertion that there is a tension of balancing day to day research support services in libraries with more in-depth editorial and analytical work.

Beside the Uppsala University academics like UUL4 who are working part-time on their own editorial projects in the library setting, respondent UUL1 noted that at Uppsala University Library, “there are a number of people working for the library who have doctoral degrees in Classics, and who have experience working on printed critical editions of Neo Latin texts—but that was before they were employed by the library, mostly” (UUL1, 2017). One example of a critical editing project that is happening in the library is *Bibliotheca Neolatina Upsaliensis*, a group of (so far) five volumes of 16th century doctoral dissertations produced at the University of Uppsala and now held in the Special Collections of the University Library and catalogued in DIVA, the Swedish repository for academic research.²² From the entire corpus of old dissertations, UUL3 (2018) notes that “we [at the library] have digitized about one third of really old dissertations. The ones between 1602 and 1850.” When asked whether this editorial work went beyond digitization, respondent UUL3 (2018) noted that the process of transmission, from digitization to digital dissemination, was “not just clerical work but much more than that.” The dissertations have been translated from Latin to Swedish and published in print editions, with critical editing work including introductions, annotations, commentary and other paratextual work by members of library staff. As UUL1 (2017) states, this work is mostly “for fun, and it’s not the most complicated editorial work, but there is still an example. It is an example of how things *can* be done at the library, outside ordinary working channels, with material in the library.” This quote suggests that there is a desire to change the status quo of who can and should perform digital scholarship in or out of

the library. This sentiment was corroborated by respondent UUL3 (2018) who stated that “we are quite a few Latinists at the library, and we do some editorial work, but more of a private nature. We are writing articles and making editions but it is not part of what we are expected to do in our job descriptions.” There is an apparent frustration on the part of librarians who previously had lives as scholars: as respondent UUL3 noted, the editorial work that does occur in the library has called to the fore historical tensions between the university researchers on the one hand, and the library staff on the other:

“[t]he library and the scholars, they have different roles. The libraries historically catalogued and made [materials] available whereas the scholars saw themselves as the ones who should interpret and [...] build the material. And there are two different roles there and there is a tension between those. And I’m not quite sure how to work that out because you know you can’t expect the researchers to catalogue, can you? And on the other hand, the scholars, they don’t want the librarians to make research on the materials [...]. [T]hey want to do the research themselves. There is an historical tension [...]. I have experienced this tension myself. I don’t have a solution, but I do think it’s a good idea to have staff at the library who are experienced scholars, who know both sides” (UUL3, 2018).

When asked if such a tension still existed, UUL3 responded that, indeed, the tension has been institutionalized:

“You know the library is not supposed to do and perform any research. We can’t start research projects at the library. We need to have a [n academic] department who is actually hosting the research project and I think that’s kind of a pity. And you know we cannot, at the library, give courses to students. We can give courses if we have a department backing us up, so you see that this tension that we have been talking about is actually built into the system at the university. The university decides that the library cannot perform research and cannot give lectures, and cannot give courses. I would like to see more courses being performed at the library and maybe also *by* the library” (UUL3, 2018).

This situation and historical tension between the library and the scholarly community in academic departments lends more context to the reason for the library staff not having plans to continue the in-depth cataloguing of the Stammbuch materials as described above by UUL4. This work, which would involve analytical bibliography, is perhaps considered too much of a

blur between the institutionally enforced dichotomy between the role of the librarian and the role of the scholar at Uppsala University. Indeed, UUL1 and UUL3 demonstrate that the situation is not that library staff can't do the scholarly work, rather that there isn't time in their schedules and/or there are institutional boundaries that keep them from doing it. Those factors coupled with the tradition of 'service' orientation in libraries means that librarians are less likely to publish or perform the meta-work of documenting and analyzing their own practices.

When asked what they envisioned as the library's future role in terms of digital editing, respondent UUL1 (2017) pointed towards ALVIN, arguing that the digital platform would continue to grow in number of digital collections – “and onto this it is possible to link projects of various sorts,” for the purpose of providing significant material to perform research “such as transcriptions and other editorial work, like critical editions, ways of showing versions in various interfaces, so there is a possibility of using the digital repository as a sort of base for a lot of critical editorial work.” Conceptualizing the ALVIN platform in this way suggests that research infrastructure provided *by* the library can be a way of enriching both collections and editorial work *within* the library. If researchers are, as UUL1 envisions, linking their projects to ALVIN “for three or five years, or whatever the length of the project,” and if, hand in hand with this linking, Uppsala University Library is hypothetically conceived as a space where research is not only *supported* but also *produced*, then it is possible that ALVIN could become a space where collaborations between researchers placed within and outside of the library could occur, to the further enrichment and interpretation of digital literary materials. Such a change would be a clear assertion and recognition on the part of the library that their role has changed – they are producing their own data and designing ways of seeing and interacting with that data. In this way, the library's digital output could be seen as one long, multi-disciplinary, distributed digital scholarship project.

ALVIN, as it stands now, however, is not utilized in such a way. It is a digital repository and a publishing platform where digital facsimiles of a range of cultural heritage material are displayed and are available for download, mostly under a Creative Commons 0 license (ALVIN, 2019). Because the materials have been digitized over several years by a group of member organizations, the digital facsimiles are of varying quality. The metadata is based on a combination of MODS (Metadata Object Description Schema) and EAD

(Encoded Archival Description). Literary text-based materials on ALVIN are mostly from Western countries, with a very small number of middle and far Eastern exceptions. However UUL1 (2017) sees the potential of ALVIN as a digital interface to bring together variants across university holdings: “Of course if you look at the critical edition as a digitized version of a printed edition, it’s very easy to make it accessible in ALVIN, or the DIVA system,” but, UUL1 (2017) notes, “if you want to do what cannot be done in an ordinary printed edition, for example with lots and lots of versions, that is something that would take time, and searching.” Respondent UUL1 went on to argue in a separate interview that a major shift for ALVIN that is definitely needed is “the possibilities to make transcriptions. These can of course form a sort of critical instance that would involve people doing some kind of assessments of the texts that they are transcribing” (2018). This would, in turn, shift the nature of ALVIN from a static digital repository to an active research environment where more critical textual work could take place.

3.3. Future Improvements in Workflows and Collaborations

Aside from the need for more staff to keep up with the volume of work expressed by interviewees from Uppsala and Gothenburg listed above, in 2017 and 2018 several interviewees across the institutions and projects expressed their frustration about the lack of a national digitization policy in Swedish libraries. As GUL1 (2017) opined, “as you may know, when it comes to Sweden and digitization, we are basically a developing country,” in the sense that initiatives are taken in fits and bursts, but there is no unifying call to action or standard across the cultural heritage organizations and the country. Interviewee LB1 (2017) posited that perhaps more critical work and scholarly editing and digitization is not happening in university libraries because there is a need for digitization policy and a national library strategy “to coordinate activities and make sure that a consistent flow of money is coming in to carry them out.” The consistency would, in effect, formalize and underscore the necessity of the work of digitization, and provide necessary government support behind it. Likewise, such a policy could advocate for the valuable contribution that library-based staff can make in the development of digital scholarship. Given this hypothetical support, librarians, photographers, image technicians, metadata specialists, and project personnel would be able to build up internal editing and transmission activities by building long-term digitization plans, writing collaborative documentation

about workflows, and setting standards across institutions, with the ultimate goal of creating more diverse small-scale digital editions, and in the long run, digitizing Swedish literary texts to the extent that Norway has achieved with the *Bokhylla* (or 'Bookshelf') project (National Library of Norway, 2018).²³ Indeed, LB3 (2018) noted that this was the goal with Litteraturbanken: 'we want to digitize all of our literary history, eventually.' Concerted effort to establish digitization policies could provide ample opportunities to develop digital scholarly editing practices within library and library-dependent research frameworks.

The other frustration mentioned by both Uppsala University Library and Litteraturbanken interviewees is that the National Library of Sweden hasn't actively or openly supported the ALVIN platform, currently the most integrated digital cultural heritage portal in the country. UUL1 (2018) noted "we are in conversations with the National Library, but much more work needs to be done." As ALVIN consists of a cooperation among Swedish research libraries to both display and provide digital records of cultural heritage materials, the hesitation on the part of the National Library to give its support seems odd. Interviewee LB2 said "it would just be great if everything was collected in one place. Everyone should be able to administrate contributions to it, too. But the Royal Library [the National Library of Sweden] hasn't supported it. There's just a lack of coordination which is a big problem." It's certainly no surprise to anyone that the risk appetite of libraries, and particularly publicly funded libraries, is historically very low (Martinez & Terras, 2019). But the trouble seems to be a needle stuck in the groove: "the Royal Library spends so much time theorizing digitization that they never get around to actually doing the critical *work* of it" (LB1, 2017).²⁴

Overwhelmingly, the opinion of interviewees at Uppsala University Library and Litteraturbanken is that currently, librarians (and libraries) serve as a support for the production of scholarship, rather than as the drivers (and spaces) of research itself. While several interviewees agreed that the role of the academic faculties is to produce research, they also argued that more action could be taken to create a prevailing 'middle ground,' where traditional academic faculties and libraries come together as equal partners to produce digital editions. This might serve to address the comments of respondent UUL3 above, regarding the tensions between the scholars and the librarians. Interviewee GUL1 (2018) said "I hope that Litteraturbanken's considerable selection of our materials will, someday, convince the Library

itself that it needs to take a more active internal role in selecting our materials for digitization.” Interviewee UUL1 (2017) suggested that a potential model for this more equal collaboration would be joint employment between a given faculty and the library, with the employee and her research situated in the library. There is a precedent for such an appointment, perhaps not in Sweden, but at Cambridge University Library in the UK: some staff of the Darwin Correspondence Project and the Genizah Manuscript Project hold dual appointments in the library and in academic faculties across Cambridge University.²⁵

4. Analysis

Returning for a moment to Renear’s distinction between critical and non-critical editing and Lavagnino’s assertion that for a textual scholar, digital scholarly editions are ‘more interesting’ than digital libraries, one wonders if, given the work performed and disseminated by Litteraturbanken and Uppsala University Library described above, such clear-cut distinctions should be reassessed? In other words, are the lines between critical and non-critical (or between ‘interesting’ and ‘not-interesting’) still relevant, or has a significant shift in the types of editing, projects, and actors occurred in the intervening years since Renear’s and Lavagnino’s publications?

One key difference between the digital scholarly edition and a project like Litteraturbanken is perhaps that Litteraturbanken focuses on elements specifically designed to be useful to students and teachers through the Skolan section, something rarely (if ever) present in a scholarly edition. In a critical edition, the focus of the work is largely on the presentation of the critical apparatus of a group of texts by a single author, including its variants, etc. Divergences between the two types of textual transmissions can be summed up succinctly: scholarly editors often assume that readers of their editions already know about the author, the text, the work, and in some cases, the editorial theory used to present the text. Litteraturbanken, on the other hand, like many digital text collections and a good number of digital libraries, assumes no or very little prior knowledge of the author or the materials. As a result, some scholars may mistakenly assume that text collections and digital libraries, and by extension Litteraturbanken, are examples of textual work that is somehow ‘less’ scholarly (if such a scale exists), or designed for

younger audiences, or for audiences unfamiliar with any type of digitally encoded project. However, this is a mischaracterization: the difference is that Litteraturbanken is not designed *solely* with a narrow selection of researchers in mind.

Even deciding upon a moniker for Litteraturbanken in this article has proved difficult. Significant discussion concerning what could be an appropriate way of describing the work done by Litteraturbanken underlies the fraught conception of what counts as research, what is considered to be publishing, and what is a repository. As Litteraturbanken calls itself a 'literature bank,' for which there is no other comparably named literary project, further confusion ensued. Articles about Litteraturbanken (Dahlsström & Dillen, 2017; Ore, 2015) have referred to it as a repository, much like ALVIN is a repository. However, Litteraturbanken does not offer the same search functions as ALVIN. The interface is much more like a digital library, and the ancillary materials provided on the site would serve to strengthen the argument for its connection to a digital edition or digital text collection. But, unlike a digital library, both Uppsala University Library (through ALVIN) and Litteraturbanken provide a user access to a number of digital critical editions through the Selma Lagerlöf Arkivet and the Strindberg editions, so indeed, the project can be seen again as both a repository and as a digital meta-edition and of itself. Such complexity defies categorization, and we circle back to calling Litteraturbanken a digital publisher, though this is still an unsatisfactory way of representing the project's range of work and outputs. Litteraturbanken is a good example of why, especially in the post-Renear and post-Lavagnino era of digital publishing, we now need to move away from specific terms and think more about the characteristics of specific activities instead.

As this article has demonstrated, however, even when we address the activities involved in the development of a project like ALVIN or Litteraturbanken, some confusion concerning the critical nature of these tasks seems to persevere. This becomes especially apparent when we take the wide range of the interviewed respondents' reactions into account, when they were asked whether or not a specific activity in their collaborative digital workflow (most notably scanning, photography, and proofreading) was a 'critical' activity – i.e. an activity where some judgment must be made, or not. For example, respondent UUL1 (2018), who has personal experience working on critical editions, said "you notice that I was immediately able to think in

these terms [of critical textual transmission], it was not a strange question for me," whereas UUL1 noted that staff such as photographers who had not been trained to view their digital work as a critical or scholarly would find the implication that they were contributing to knowledge production quite strange.

Textual criticism has traditionally been theorized as the process of tracing back multiple variants of a text as they have been copied by multiple witnesses, in order to discover the 'ur' text, and, by extension, to understand the author's original intentions (Gabler, 2018, p. 153; Gaskell, 1972, p. 336). Transmission, then, is the process of moving these variants from one version, or edition, to the next. The most classical application of textual criticism has been on biblical works (Terkel, 1994, p. 1–15). As Hans Walter Gabler has argued, transmission is itself an editorial lodestar, and contributes heavily to our literary canon: "Editors can, for sure, put works and texts, or indeed authors (of the past or the present), on the literary map, and within the ken of a general cultural awareness" (2018, p. 363). However, more recently, *critical* transmission has been defined as the process by which texts are transmitted, through a long chain of decisions and encoding, from the physical (either as a manuscript or printed book) to the digital (Björk, 2015; Dahlström, Hansson, & Kjellman, 2012). By extension, the term 'critical transmission' can therefore also refer to the effect that is created through such digitization – not just its effect on understanding of texts themselves by scholars, but also its effect on a wider disciplinary understanding of what (and in this context: *who*) makes up the workflow and practice of digital scholarly editing. The addition of the word *critical* to the term transmission denotes a focus on the analytical decision-making process inherent in the digitization chain, and brings to the fore implicit assumptions about the way in which transmission is performed, and the extent to which it can be deemed a scholarly process.

The internal collaborative workflow of Uppsala University Library staff to disseminate materials on the ALVIN platform and the external workflow of Litteraturbanken staff with regard to Gothenburg University Library both involve critical transmission activities. The workflow of both projects starts with the selection of relevant and textually interesting materials. In the case of Litteraturbanken, the knowledge of librarians at Gothenburg University Library points the editorial team in the direction of manuscripts that would be particularly interesting for editorial reasons, or suggests certain copies of

printed books over others because of annotations that could add more interesting textual engagement for readers. For Uppsala University Library staff, selection is often tied to financial considerations, or material ones (e.g. in the case of fragile materials that need to be taken out of reading room circulation). In both cases, team members have to engage in financially scoping the work in terms of staff hours, copyright, and the availability of photographic or scanning equipment. In the case of both Uppsala and Litteraturbanken, external funding is needed to carry out the digitization. From there, technical staff – working in close collaboration with conservators, librarians (in the case of Uppsala), and researchers (in the case of Litteraturbanken) – perform the digitization process, which involves photography and/or scanning, colour correction of digital images, file compression, OCR scanning, and (in the case of Uppsala University Library staff) error-proofing the image metadata once it has been uploaded in ALVIN. In the case of Litteraturbanken, digital facsimiles of texts are encoded with TEI-XML, misspelled words of texts are emended (and an apparatus with textual emendations is presented to the reader), the encoding is proofread, and accompanying texts and audio are linked to the digital facsimile to give it context in the wider understanding of the work of a given author. Both workflows include steps for file uploading, creating file download options based on copyright restrictions, and maintaining access and preservation files of digital texts and/or digital facsimiles. There are multiple interventions where a variety of critical skills are needed in order to perform the work, and this work is done in collaboration, following a long chain of analytical decision making.

Just as Terras (2015) described how digitization in libraries is conditioned by resources and institutional frameworks, so too are the processes of digital editing and critical transmission. As we have seen above in our examples of Litteraturbanken and Uppsala University Library, these activities are enacted in different ways depending on the parameters of a given project, the different tools and workflow practices in place, and indeed the experience of the editors, photographers, technologists, conservators, and librarians who may be involved. In these two Swedish digital scholarship environments, critical transmission activities are performed by editors, librarians, technologists and library staff in various forms. This article has shown that the staff involved in this transmission are, to varying degrees, aware of the connection of this process to digital scholarly editing practices. Still, awareness (or not) of what can be deemed editorial work does not change the fact that these processes are, indeed, occurring in the library.

5. Conclusions

In this article, we considered how elements of digital scholarly editing practices are performed in the collaborative digitization and editorial workflows of two Swedish digital research environments. On the one hand, we explored Litteraturbanken, a digital publishing project with digital editing and digital library elements. On the other hand, we explored Uppsala University Library, a library with both digital publishing and editing elements. Litteraturbanken is a project team working closely with a University library but external to that library. Uppsala University Library uses internal collaborations to disseminate digital texts on a national digital catalogue managed by that Library. Uppsala University Library was chosen because it exemplifies the new and changing roles for research libraries – from being the repository of texts to becoming an actual provider of high-quality full-text versions of physical holdings and of advanced research data. Litteraturbanken exemplifies new kinds of actors who are working in the space between where libraries and scholarly editors have traditionally placed themselves.

What brings both Uppsala University Library and Litteraturbanken together, besides their desire to promote the wealth of Swedish and Scandinavian literary history, is that they each comprise a set of complex teams with diverse backgrounds in collaborative digital scholarship practices, that design digital infrastructures for digital literary output, and require deep knowledge of bibliographic and textual scholarship. The two respective groups' expertise in these areas, as well as their familiarity with the standards of digitization, preservation, and sustainability of the data present in digital projects, helps to give them well-established authority on questions of how the relationship between researchers and institutions affects the output of projects on which they work. Below we describe the conclusions of this article and how we can address the issues identified in Litteraturbanken, Gothenburg University Library, and Uppsala University Library.

5.1. New digital outputs are challenging our understanding of who performs scholarship

We argued in Section 4 that examples like Uppsala University Library and Litteraturbanken show a need for a reorientation – from critical versus noncritical editing, or digital library versus digital scholarly edition – toward

considering a range of critical transmission activities. This is not to argue that traditional endeavours no longer hold an interesting place in textual scholarship. Rather, that new digital projects led by library collaborators with experience in scholarly editing and in library digitization are blurring the lines between these traditional projects and opening up the field to new players. The digital facsimile is an excellent example of this: when examined closely, it evidences the critical decisions made by photographers and image technicians to adequately light, colour-grade, sharpen and process images, as well as the analytical bibliographic decisions that are made by librarians and conservators to describe the physical and textual contents of a given document. Much like digital documentary editions, digital facsimiles of printed books or manuscripts provide a reader with the textual and material complexities of a specific source document (rather than a group of source documents, as is the case in critical editions). Unfortunately, with few exceptions, the process of creating digital facsimiles is not given adequate consideration by scholarly editors as evidence of textual scholarship.²⁶

5.2. These new outputs require a reorientation of our existing terminology

Aside from reorienting ourselves toward critical transmission activities, we will also soon need a reassessment of current digitization terminology discussed in Section 1 of this paper. We read about mass digitization (i.e., large-scale digitization of a broad corpus performed clerically and at low cost) versus critical digitization (small-scale digitization of carefully selected materials done critically and at high cost) in the field of digital humanities (Björk, 2015; Dahlström, 2011; Dahlström et al., 2012; Gooding, 2013; Gooding, Terras, & Warwick, 2013). But it is also important to consider that examples like Litteraturbanken and Uppsala University Library demonstrate how the lines between these definitions are blurring as we continue to research the way in which work is carried out in these non-traditional digital environments, and how library collaboration with digital research project teams infuses necessary scholarly interpretations into this work. A physical library collection of a relatively large size may be (relatively) quickly subjected to more and more critical interventions in the digitization workflow as technology and software develop, and as photography equipment becomes increasingly capable of picking up minute visual details of the material aspects of documents. As a result, the vocabulary we use to denote mass digitization and critical digitization will need to change.

5.3. These new projects, outputs, and actors force us to reconsider how we perform scholarship gatekeeping

The interviews we carried out with Uppsala University Library staff have shown how the boundaries between the library on one side and faculties on the other may be blurring due to the complex, library-based editorial work occurring in new projects, but also that institutional barriers are keeping more critical work from occurring in libraries. The close collaboration between library staff and researchers carries with it an imperative to cite and recognize the work of librarians and archivists (and, in this case, photographers and image technicians) as ‘valued interlocutors and intellectual equals’ in the creation of scholarship (Whearty, 2018). To choose not to do so is to perform what I am calling *scholarship gatekeeping*, or the practice of actively enforcing boundaries around who ‘counts’ as a scholar in the digital humanities ecosystem. Through her development of the Caswell Test, Whearty (2018) argues that according appropriate respect for scholarship involves citing archivists and librarians in scholarly output and talking with and listening to these colleagues. While this may seem straightforward enough in principle, this study of Litteraturbanken and Uppsala University Library has made clear that not even the staff members who are participating in library-based digital work would always designate their work as scholarship, and that the widespread practice of erasing input from librarians and archivists in the publication of academic work (e.g., the trope of a scholar ‘unearthing’ or ‘discovering’ a collection in a library or archive that has actually been critically catalogued by a scholar and is freely available to everyone) is intimately connected to this current state of affairs. Just as there exists a long chain of critical transmission activities present in libraries and library-dependent digital projects, so too does there exist a long chain of events through which bibliography, cataloguing, and other library-specific work has been relegated to the sidelines and designated as support, rather than scholarship. Respondent UUL3 brought this up when addressing the ‘historical tension’ between the library and the academic departments at Uppsala University. This ignores the wealth of expertise and significant effect that librarians and technologists have to offer on textual scholarship. This expertise must be recognized for what it is: a condition through which the content of a project is enriched, and without which, a project and its readership suffers.

Library-based cultural heritage digitization continues to become more prevalent and users increasingly assume that any item they might wish to access will be available online (Caro, 2016; Terras, 2015). As this trend continues,

librarians' and library technologists' activities are greatly affected. Similarly, as the possibilities associated with digital editions continue to be explored by textual scholars, there is an opportunity for librarians with backgrounds in textual scholarship and for cultural heritage photographers to assert their place as scholars who can offer expertise, not just as staff working at a library or center where the projects might eventually be catalogued and preserved. Rather, in line with Whearty's thinking detailed above, they should be regarded as equal research partners in the development of digital editing projects. Where once transmission was the realm of printers and textual scholars placed in academic faculties, now access to better equipment and the formulation of new, collaborative workflows, along with the redistribution of textual scholars to library roles, has meant that clear-cut distinctions between the activities of librarians and faculty are blurring, if they ever even existed beyond the institutional boundaries that enforced them. Perhaps we as a scholarly community need to devote time to thinking critically about why we are enforcing these boundaries, and what we stand to lose – or gain – if we let them go. This is certainly not a new call to action, as aspects of the tensions of library-based scholarship have been explored by Nowvieskie (2011), Muñoz (2012), and Morgan (2016) in the past. Digital scholarly editing will continue to progress and perhaps broaden as a set of practices, which either will or will not be widely integrated and adapted into library training programs, research guidelines, mission statements, and nationally-funded policies. Regardless of how those processes are institutionally sanctioned through policy, it is clear that librarians, library-based technologists, and library-dependent projects are already playing a crucial role in the critical transmission of literary texts.

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Notes

¹ <https://www.bodleian.ox.ac.uk/dbooks>. Oxford's Google Books data is still available through the collection, though it is optimized for Internet Explorer, which was a popular browser during the project's inception and delivery (2004–2009). Instructions for interoperability with the Firefox and Chrome browsers, which are used to a much greater extent than Internet Explorer at the present (2019), are provided on the site. One downside is that none of the digitized books have undergone OCR processing (Optical Character Recognition), so they are not machine readable or full-text searchable.

² For more information about the Great Parchment Book and a video detailing its 3D reconstruction, visit <http://www.greatparchmentbook.org>. The 3,000 year-old Chinese Oracle Bones – the second oldest text-bearing objects in the Cambridge University Library collections – can be viewed at <https://cudl.lib.cam.ac.uk/view/MS-CUL-00001-00155/1>.

³ For a significantly more in-depth picture, see Greetham, D. (2013).

⁴ For an introduction to and critique of editorial orientations, see Shillingsburg, P. (1996). For a more recent revision of Shillingsburg's orientations, see Van Hulle, D., and Shillingsburg, P (2015).“

⁵ <http://www.nnedit.org>.

⁶ <https://svenskavitterhetssamfundet.wordpress.com/english/>.

⁷ <http://sks.dk/forside/indhold.asp>.

⁸ <https://www.ibsen.uio.no/>.

⁹ <http://topelius.fi/?language=fin>.

¹⁰ <https://litteraturbanken.se/forfattare/LagerlofS>.

¹¹ The Nordic countries consist of Greenland, Denmark, the Faroe Islands, Finland, Iceland, Norway, and Sweden.

¹² Språkbanken is a research unit in the Department of Swedish at the University of Gothenburg. The prerogative of the unit is the development of linguistic tools for the study of the Swedish language. For more information, see <https://spraakbanken.gu.se/>.

¹³ <https://litteraturbanken.se/om/organisation>.

¹⁴ The Carolina Rediviva Library was extensively refurbished starting in the Spring 2017 and ending in May 2019. More information (in Swedish, though translatable using a browser plug-in) about the process of this reconstruction can be found at <http://rediviva.ub.uu.se/exempelsida/>.

¹⁵ More information about the Ångström Makerspace can be found at <https://ub.uu.se/use-the-library/makerspace>.

¹⁶ For more information about the Ekonomikum Digital Library Lab and the Ångström Visualization Lab, see <https://ub.uu.se/use-the-library/labs/>.

¹⁷ <https://ub.uu.se/about-the-library/exhibitions/codex-argenteus/about-the-project/>.

¹⁸ <http://uu.diva-portal.org/smash/record.jsf?pid=diva2%3A925448&dswid=4478>.

¹⁹ http://www.alvin-portal.org/alvin/resultList.jsf?aq=%5B%5B%7B%22COL%22%3A%22uub_linnaeus_correspondence%22%7D%5D%5D&sortString=relevance_sort_desc&aqe=%5B%5D&af=%5B%5D&searchType=EXTENDED&noOfRows=10&dswid=2756.

²⁰ While it is common to hear and read discussions of 'dpi,' or dots per inch, that is actually a reference to printing. I.e, a given printed image will have 300 dpi, or dots of ink, per inch. When referring to rendering of digital images, the correct nomenclature is the amount of ppi, or pixels per inch, that will be visible on a given screen.

²¹ More information about the LIMB Processing software can be found at <https://www.i2s.fr/en/product/limb-processing>.

²² More information about DIVA (Digitala Vetenskapliga Arkivet) can be found at <http://www.diva-portal.org/smash/search.jsf?dswid=-4724>.

²³ The *Bokhylla* project, which was originally only available to users with a Norwegian IP address, allows digital access to every Norwegian book published until the year 2000. It is now possible for users with non-Norwegian IP addresses to apply for limited access to this vast digital collection. For more information, visit <https://www.nb.no/en/access-to-bokhylla/>.

²⁴ Multiple representatives of the National Library of Sweden were contacted to comment on this point, and although the author was passed (via email) to a source who could comment, a reply was never received.

²⁵ <https://cudl.lib.cam.ac.uk/collections/genizah/1>; <https://www.darwinproject.ac.uk/>.

²⁶ For one notable exception, see Chapter 4 in Pierazzo (2015).