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Book Review

In situ Fragments in Beinecke Library Incunabula

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Abstract: This article describes the results of a survey of the Beinecke Library's over 3,400 incunabula for in situ manuscript fragments. It offers a benchmark for the incidence of manuscript fragments in these bindings (7–8%) and considers the relationship between in situ fragments and book size. It also suggests further avenues for research on in situ binding fragments with implications for studies of provenance, binding techniques, and the formation of North American collections.

Keywords: in situ fragments, Yale, Beinecke Library, incunabula

In a 1994 article, the then-curator of Early Books and Manuscripts at the Beinecke Library, Robert Babcock, described roughly a half dozen examples of classical texts preserved in sixteenth-century bindings from Venice.[1] In the article, Babcock observes a pattern of manuscript binding fragment content (classical texts) as well as a

* This project was only possible with the exceedingly generous cooperation of the Beinecke Library staff at all levels. I am forever indebted to Raymond Clemens for hiring me as a curatorial assistant, encouraging my work, trusting me with the collections, and setting me on the path to working with manuscript fragments; to E.C. Shroeder for allowing me to represent the Beinecke Library partnership at the two *Fragmentarium* meetings (Fribourg 2016 and St. Gall 2017) and for the summer fellowship that allowed me to complete my initial survey; to Beinecke archivist Mark Custer for his help wresting incunabula metadata from the library's back-end cataloguing systems; and to the incredible Access Services staff of the Beinecke, who compiled carts of volumes for me to study, brainstormed methods for working through the collections for the purposes of this survey, and otherwise facilitated this research in a dozen ways, including making me feel at home in the Beinecke, particularly Natalia Sciarini, John Monahan, Moira Fitzgerald, Ingrid Lennon-Pressey, Anne Marie Menta, Mary Ellen Budney, Anna Franz, and Adrienne Sharpe.

1 R.G. Babcock, "Manuscripts of Classical Authors in the Bindings of Sixteenth-Century Venetian Books", *Scrittura e Civiltà* 18 (1994), 309–324. Please see the appendix for updates about the volumes Babcock identified in his study.

pattern of their material configuration: one of the contributions of this article was in detailing the practice of using of binding fragments as spine liner strips that had not been described before. Babcock's study suggested that the Beinecke collection was in need of a more comprehensive survey of early bindings, both for the purpose of creating fuller descriptions of the volumes themselves, and in order to identify similar examples or patterns of manuscript material used in the bindings.[2] In 2010–2011, some of the Beinecke bindings were studied by Scott Husby in the context of his long-term project on American collections of fifteenth-century print volumes in original bindings, the *Bookbindings on Incunables* database.[3] In the course of his data collecting, Husby recorded ninety-four Beinecke incunabula volumes that contained fragments of medieval manuscripts, though the presence of in situ fragments was not the focus of his census work, nor was his survey restricted to the Beinecke collections, either: he also visited two other campus collections during his fellowship. This article builds on the foundational work of these predecessors and focuses exclusively on fragments of manuscripts used in incunabula bindings that are now in the Beinecke Library collection. My own contribution is to propose two new axes for the study of binding fragments: to consider the relationship between in situ binding fragments and book size, and, using this collection, to offer a data-driven benchmark for the incidence of in situ binding fragments in incunabula (7–8%).

The survey of incunabula bindings that I undertook to gather this data was begun while I was working part-time during graduate school as a Curatorial Assistant. It was later completed with the generous support of a Beinecke Library *Fragmentarium* Fellowship in summer 2017. This research and the associated fellowship provided

2 Babcock, "Manuscripts of Classical Authors", 311.

3 S. Husby, "Bookbindings on Incunabula in American Library Collections: A Working Census", in *Early Printed Books As Material Objects: Proceedings of the Conference Organized by the IFLA Rare Books and Manuscripts Section Munich, 19–21 August 2009*, ed. B. Wagner, and M. Reed, New York 2010, 205–215. *The Scott Husby Database of Bookbindings on Incunables*, formerly hosted on the website of the Bibliographical Society of America, and later by Princeton Libraries, is unfortunately no longer hosted online or publicly accessible.

one of the initial six *Fragmentarium* case studies. The goal of my case study at the Beinecke was twofold: first, to complete the survey (begun in 2015) of incunabula within the collection in order to identify those volumes that still preserved manuscript fragments in their bindings; second, to begin systematically photographing and cataloguing the binding fragments identified in the course of the survey. Further and ongoing aims of this work include completing photography of the volumes, and making these binding fragment records searchable and discoverable within the Yale Libraries catalogue, by first indicating the presence of manuscript waste within the host volume records, and by then creating catalogue records for the binding fragments themselves. Unlike at the Bodleian Library—where *Fragmentarium* Fellow Ruth Mullet worked on binding fragments for a companion case study—no systematic or comprehensive census of in situ fragments had previously been undertaken at the Beinecke.[4] Existing records, then, included Scott Husby's notes described above, and some paper records inside the books themselves: incunabula that were acquired early in the Beinecke's history had been carefully described on typewritten collation slips pasted inside the back boards of most volumes. These collation slips occasionally make mention of manuscript binding material, either by simply signaling the presence of manuscript binding material, or by characterizing in a general manner the contents of binding fragments made of print or manuscript waste. Many collation slips, however, do not mention manuscript waste at all, and in numerous cases the papers are themselves pasted directly onto manuscript board liners or pastedowns.

At the outset of the project, my decision to survey incunabula holdings was, in some respects, arbitrary, because there is no predictable relationship between the printing date of the bookblock and the date of the binding in which the bookblock is currently found. What is more, the practice of binding with manuscript material was already well established before the advent of print,

4 R. Mullet, "In Situ Manuscript Fragments in the Incunables of the Bodleian Library, Oxford: A *Fragmentarium* Case Study." *Fragmentology* 1 (2018), 111–120.

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and it continued beyond the incunable era and well into the eighteenth century, with occasionally even later examples.[5] In other words, an incunabulum with in situ binding fragments might have been bound in the fifteenth century with that manuscript waste or rebound with it in the seventeenth century. On the other hand, limiting my scope to incunabula was motivated by some considerations that were purely practical: the Beinecke holds some 3,400 incunabula. As such, it represents one of the larger incunabula collections in North America. Other significant holdings can be found at the Newberry Library (2,000 volumes), the Morgan Library and Museum (2,800 volumes), Houghton Library (3,000 volumes), and the Huntington Library (5,500 volumes), with the largest collection, some 5,600 volumes, at the Library of Congress. Since I surveyed the entire collection, the decision to limit my attention to incunabula was done to constrain the scope of volumes surveyed to a more or less reasonable number of items. We can anticipate that a survey of earlier and later volumes held by the Beinecke would bring to light numerous additional binding fragments, and in fact, Robert Babcock's article offers a first step in this direction. I hope that other efforts will follow.

The work that I describe here is also a first step. In addition to the larger aims of a research collaboration with Kıvılcım Yavuz focused on nuancing taxonomies of in situ manuscript binding fragments, the purpose of the present article is to report preliminary numbers of in situ fragments in the Beinecke Library incunabula.[6] Where Ruth Mullet has shown the promise of studying in situ fragments within their host volume context to recover provenance information about binders and readers of incunabula, and Ivana Dobcheva and Christopher Mackert were able to reunite some ex situ fragments with their host volumes and identify some idiosyncratic binding practices after their own binding study and cataloguing efforts, the present survey extends the work of these important precedents while adding a new perspective: that of in situ fragment studies

5 See below on pp. 145–147 for an example.

6 I am grateful to the University of Leeds for aiding in establishing this collaboration with the support of an AHC International Academic Mobility Fund grant in July 2025.

within the context of North American rare book collections.[7] These North American collections, formed differently than their European counterparts, offer in turn a different sphere of comparison through examples of in situ binding fragments, as well as early print volumes, from many and disparate origins. After reporting the overall results of the binding survey, I will offer some observations about patterns of the reuse of manuscripts as binding material taken from this corpus. I will then highlight a handful of examples that emerge from this context as unusual, and which might inform future efforts to use evidence from the way that in situ fragments feature in bindings as a source of provenance information. Finally, I will analyze the survey findings in the context of North American collections more generally and suggest some future directions and possible payoffs for in situ binding fragments research. These future directions include identifying uncommon or even idiosyncratic binding techniques using manuscript material and nuancing the vocabulary of in situ binding fragments in order to facilitate the identification of such uncommon practices. The payoff is suggested in the enormous potential for new kinds of provenance information that in situ fragments represent, from specific binders to regional practices, and even to commercial networks of manuscript binders' waste.

Overall, my survey work in 2015 and 2017 resulted in the identification of 240 incunabula out of the 3,400 in the collection that contain binding fragments. Those 240 volumes contained at least 462 distinct fragments representing 318 original *codices discissi*. In many cases, a single volume or a set of volumes might contain multiple fragments from the same original codex. In general, these numbers indicate a 7% incidence rate of in situ binding fragments across the collection—that is, not of fragments surviving only in those volumes retaining their original bindings, but across all of the Beinecke's fifteenth-century print holdings. At the same time, this 7% incidence rate is conservative. A handful of additional volumes in the Yale University library catalogue are tagged with the MARC

7 Mullet, "In situ Manuscript Fragments"; I. Dobcheva and C. Mackert, "Manuscript Fragments in the University Library, Leipzig: Types and Cataloguing Patterns", *Fragmentology* 1 (2018), 83–110.

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index term Genre/Form (field 655) "Manuscript waste (Binding)." After concatenating duplicate records resulting from multiple copies of an incunable, each with a different call number, showing up in search results, there are twelve volumes I have added to my survey results based on this index term. Another eleven volumes were identified by Husby as containing manuscript waste, but were not items that I had identified in my own survey, either because I failed to find these specific examples, because the volumes were overlooked in paging, or by some other accident. Adding both of these additional numbers to my own total gives us 263 volumes out of 3,400 containing manuscript fragments in their bindings, or an incidence rate of closer to 8%. Despite the infelicities in my early data collection, and my plans to return to the Beinecke and to the project to collect additional images and clarify and reconcile the various catalogue and survey information about specific volumes, the results are nonetheless worth sharing at this time for the larger picture this collection offers of binding practices with manuscript materials across a wide geographic and chronological range.

These survey numbers merit a few additional caveats. First, I did not distinguish between recycled binding materials deriving from documents and those coming from manuscripts (*codices discissi*). Both kinds of original handwritten objects figure in the dataset. Second, although my goal for this project was to catalogue the Beinecke binding fragments, I included in my dataset some volumes containing binding fragments that cannot yet be read or fully described. Examples include limp and parchment bindings that were made from repurposed documents, which were glued to the boards front-side-down or which had their text darkened or otherwise obscured, partially damaged or partially lifted pastedowns revealing the presence of manuscript board liners, and sewing guards in the center of quires whose presence can be noted but whose text cannot yet be recovered due to any combination of folding stubs into the gutter, trimming stubs close to the stitching, or simply a tight binding [Figure 1]. These yet "invisible" fragments, numerous in the collection, require further study via special imaging techniques that were not available to me in 2017, and so their description was left to a later time, but for my purposes, the presence of manuscript binding

Figure 1: Bottom edge view of Zi 4158, Beinecke Rare Book and Manuscript Library, Yale University

material still merited their inclusion in the survey. I have also included in the survey count manuscript fragments represented only by offsets (the transfer of ink from ex situ fragments) that remain visible, usually on a board where a film of glue originally securing a pastedown has retained an impression of the writing that was once attached to it, though offsets can also occur within the text block from adjacent manuscript material, such as in the center of quires that once featured sewing guards.

Finally, the Beinecke Library is actively acquiring and now reports holdings of 3,500 incunabula, though these volumes are not

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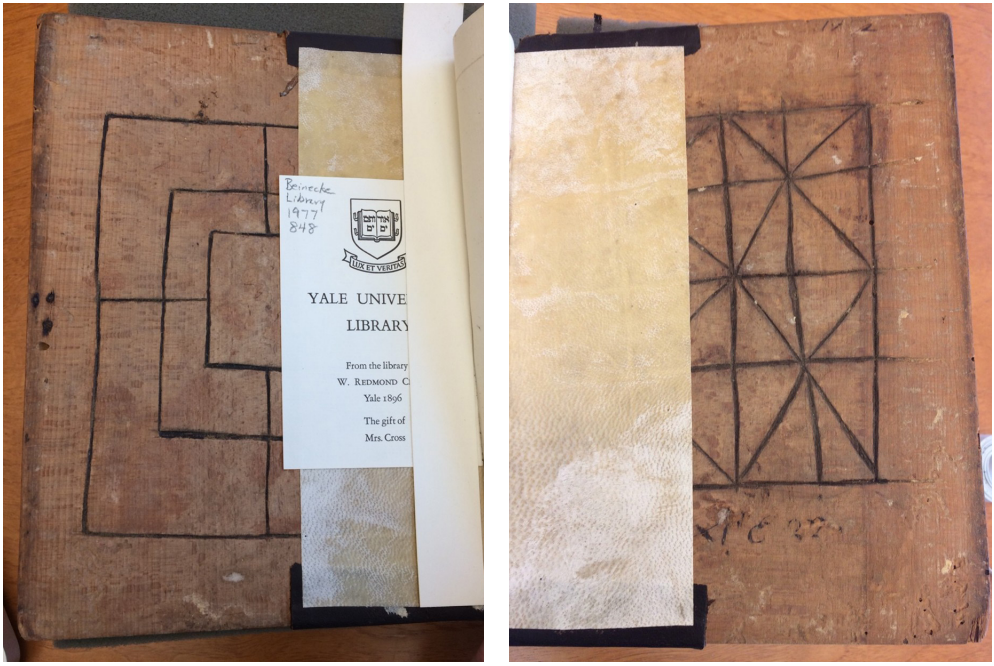

Figure 2: The game boards on the front (Nine Men's Morris) and back (Alquerque) inside boards of 1977 848, Beinecke Rare Book and Manuscript Library, Yale University

all catalogued and not all yet searchable with the Special Collections subject "Incunabula in Yale Library." My survey only accounts for volumes of the oldest acquisitions, a period during which incunabula were shelved by format (with call numbers Zi ## for octavo, Zi +## for quarto, and ZZi ## for in-folio volumes), and of the incunabula arranged by acquisition year (eg. 1974 ## for octavo, 1974 +## for quarto, and 1974 Folio ## for in-folio volumes) from 1971 through 2015 and those volumes that had been acquired in 2017 and accessioned by May 2017. Finally, because of my particular focus on premodern manuscripts used within bindings, I excluded from the records I report here examples of manuscript binding fragments from later periods, binding fragments of printers' waste, pre-1600 manuscript material bound into or recorded within the bookblock of an incunabulum, and lifted pastedowns with notes, texts, and inscriptions

that were added by a reader or owner after the volume's first binding. The survey provided a unique opportunity to observe thousands of incunabula, and to note other features of these volumes beyond their use of manuscript binding materials, such as their hardware, stamping and tooling motifs, leather finishing techniques, and—in one case—the use or reuse of the volume's oak boards for the medieval strategy board games Nine Men's Morris and Alquerque [see Figure 2].

Although I do not have comprehensive data for all the volumes represented in the survey, Scott Husby has kindly and generously shared his data on the bindings of Yale volumes in which he observed manuscript waste. Husby's data, though a cross-section of the larger picture, is nonetheless interesting in that it contradicts the impression that binding fragments may only survive in, or predominantly in, original bindings. The volumes Husby identified as containing manuscript fragments came not only from the Beinecke Library (94 volumes), but also from the Medical Historical Library of the Harvey Cushing / John Hay Whitney Medical Library (20 volumes) and the rare book collection of the Lillian Goldman Law Library (15 volumes), both also at Yale University. Of these 129 volumes with in situ manuscript fragments, Husby identifies 81 bindings as more or less contemporary with the date of printing before 1501, which represents about 63% of the bindings containing manuscript fragments that he noted. The remaining 36% of the volumes are currently housed in later, post-fifteenth-century bindings. More than 18%, or nearly one in five of the volumes containing manuscript fragments, are identified by Husby as "modern" bindings, from the nineteenth century or later. These data stand in contrast to findings from European collections in large state institutions, which suggest that bindings with manuscript fragments drastically diminished in the late seventeenth century, and so attest to the importance and unique perspective of North American collections.[8] There are many factors

8 See, for example, N. Pickwoad, "The Use of Fragments of Medieval Manuscripts in the Construction and Covering of Bindings on Printed Books" in *Interpreting and Collecting Fragments of Medieval Books: Proceedings of the Seminar in the History of the Book to 1500*, Oxford 1998, ed. L.L. Brownrigg and M.M. Smith, Los Altos Hills 2000, 13; K. Kaska and F. Simader, "Vom Umgang

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at play, including binding context (artisanal versus industrial) and the potential reuse by modern binders of manuscript fragments from these imprints' earlier bindings. In any case, the number of later bindings containing in situ fragments is considerable and justifies the inclusion of later bindings and, by extension, of later printed volumes, in future binding survey efforts. As an outlying example, one case I will discuss below involves a bookblock, rebound or at least restored in the nineteenth century, wrapped in a leaf from a Carolingian Bible that appears to have been copied at the turn of the eleventh century.

Before turning to exceptional cases such as this early Bible leaf wrapper, I will now offer additional overviews of the Beinecke data in hopes of conveying both the breadth of in situ examples and also the way they suggest certain patterns or norms of manuscript recycling in bindings. The following is not a mathematical exercise but a descriptive one, for which the numbers help illustrate some observations that might be useful for the future study of in situ manuscript fragments. Regarding format, the majority of Beinecke in situ fragments are found in quarto volumes (140 of the 263 volumes or over 53%). A little over a third of the volumes containing manuscript waste are in octavo format (91 vols. or almost 35%), while the fewest examples of in situ fragments are found in in-folio incunables (32 vols. or 12%). The folio examples—at least based on the data compiled here—also contain on average a larger number of in situ fragments per volume than the quartos or octavos. This makes good common sense, given the size of folio boards, the comparatively small size of manuscripts that must have become obsolete by the fifteenth century, and thus the need for a binder to

großer Bibliotheken mit Fragmenten am Beispiel der Österreichischen Nationalbibliothek", in *Frammenti di un discorso storico: per una grammatica dell'aldilà del frammento*, ed. C. Tristano, Spoleto 2019, 348; A.M. Stützle-Dobrowolska, "Was uns Makulatureinbände über die Bücherschätze des vorreformatorischen Grossmünsterstifts überliefern", *Zürcher Taschenbuch* 134 (2014), 96; J. Brunius, "The Recycling of Manuscripts in Sixteenth-Century Sweden" and A. Ommundsen, "A Norwegian – and European – jigsaw puzzle of manuscript fragments", in *Nordic Latin Manuscript Fragments. The Destruction and Reconstruction of Medieval Books*, ed. A. Ommundsen and T. Heikkilä, London 2017, 71 and 135 respectively.

Format	Share of collection	with in situ ms.	Share of in situ ms. volumes.	% of format with in situ mss.
Octavos	51.09%	91	34.6%	5.24%
Quartos	43.85%	140	53.2%	9.39%
Folio	5.06%	32	12.2%	18.60%
Total	100%	263	100%	7.74%

Table 1: Beinecke incunabula in situ fragments by format

use multiple leaves of smaller manuscripts to cover the boards with binding waste used as board liners or pastedowns. With respect to the overall makeup of the collections, the numbers of quarto and folio volumes are overrepresented among those volumes containing fragments [Table 1].[9] However, these numbers are better contextualized within the incidence rate of fragments when separated by format. In considering the collection in these terms, it seems clear that the larger the volume, the greater the chances of finding in situ manuscript fragments.

There are many reasons why these observations about format and the incidence rate of in situ fragments may or may not be generalizable: the scope of my survey (limited only to this collection of the oldest printed books from Western Europe); survivorship bias; the provenance of a particular item, including the likelihood of that item being rebound; and the number of times it has changed hands, particularly in the twentieth-century rare books market as dealers and buyers became increasingly interested in fragments. On the other hand, the data are consistent in both the overrepresentation of binding fragments in quartos and folios with respect to the makeup of the Beinecke collection, and with the rates of incidence by format. This suggests that the larger format volumes on the whole not only contain larger numbers of fragments, but that they also more frequently retain in situ fragments. The logic of the

9 When these data were collected, the Beinecke incunabula collection had roughly 3,400 volumes. The exported records provided to me consisted only of records that were consistently catalogued, represented items held by the Beinecke Library, and contained the Special Collections Subject "Incunabula in Yale Library" mentioned above, some 2,492 volumes, and I have extrapolated the proportion of folio, quarto, and octavo volumes to the full 3,400.

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first observation holds, considering that more manuscript material is needed to cover, line, or otherwise reinforce larger format books. The second is harder to explain, but perhaps the rate of incidence of in situ fragments in folio volumes is related to the relative scarcity of volumes of this size. Another possible explanation is purely economic in nature: manuscript fragments were recycled materials used to keep down binding costs, which is why they do not appear in luxury bindings in visible or prominent places. As bindings for larger volumes are more expensive, perhaps the use of manuscript fragments was simply a cost-saving measure to make such bindings more affordable.[10]

It will come as no surprise that the vast majority of in situ fragments in Beinecke incunabula are written in Latin, and that the fragments come overwhelmingly from liturgical books. Among these are a large number of liturgica with music recorded in a variety of notational systems. In terms of languages represented, the survey also turned up, however, a handful of documents in German, a French literary manuscript, two volumes wrapped in leaves from a Spanish account of legal proceedings concerning family law, and several fragments from Hebrew manuscripts (more on these below). Regarding the genre of in situ manuscripts, the binding fragments include a legal dictionary, literary manuscripts of poetry and prose, theological and philosophical works, treatises on canon law, hagiography, a grammar, Torahs and Bibles, and various documents, including a papal bull. The in situ fragments also cover a wide chronological range extending from the turn of the eleventh century through the late sixteenth century, and even later examples that, as described above, were excluded.

It is not always easy to determine how manuscript waste was originally incorporated into a binding, even when these fragments remain in situ. Damage caused by handling or by environmental conditions, glue failure over time, conservation interventions, and successive rebindings can obscure the physical context of some original binding materials. Still, the in situ fragments surveyed here occur in a predictable range of locations within the volume:

10 I am grateful to the anonymous referee for this insight.

as coverings or wrappers over wood or stacked paper boards, folded into limp bindings, as endpapers attached and arranged in a variety of ways to the bookblock and the boards or as separate pastedowns, and as board liners, spine liners, text guards (around first and last gatherings), and sewing guards (in the center of one or more gatherings).[11] Rather than quantify the different types of manuscript reuse, all of which are numerous across the surveyed items, or nuance the terminology in a way that highlights the different techniques on display in these cases, I will focus first on certain qualitative observations about the use of manuscript binding material that speak to broader practices.

For example, we might arrange the in situ fragments on a spectrum from functional to aesthetic according to how they are used in a given binding context. The categories are not entirely distinct, as there is a great deal of overlap, and admittedly they are also quite subjective. And, indeed, all binding fragments necessarily serve a function. But the Beinecke examples as a whole are suggestive of a range of practices and proclivities among binders within which these categories can highlight some distinctions.[12] On one extreme, that of functionality, we might place sewing guards as a general rule, since they are often so severely trimmed that their presence can only be confirmed by looking from the top or bottom edge of the volume, as in Figure 1, but the contents of the *codex discissus* remain inaccessible, particularly in a tight binding where visual access to the gutter is impossible without threatening the integrity of the binding structures. Similarly, board and spine liners are often concealed and can even be undetectable unless the volume has suffered damage to the binding or researchers have recourse to technological interventions such as X-Ray fluorescence, CT scanning, endoscopy, or other emerging recovery techniques.[13] Finally, wrappers made of

11 On text guards and sewing guards, see the *Language of Bindings* (LOB) database (https://lob.is.ed.ac.uk/concept/3697, and https://lob.is.ed.ac.uk/concept/3282, respectively).

12 Pickwoad makes similar observations about the "decorative impulse" of some binders. See Pickwoad, "The Use of Fragments of Medieval Manuscripts", 4–6.

13 See J.E. Ensley, K.H. Tachau, S.A. Walsh, H. Zhang, G. Simon, L. Moser, J. Atha, P. Dilley, E.A. Hoffman, and M. Sonka, "Using computed tomography to recover hidden medieval fragments beneath early modern leather bindings,

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recycled manuscripts can be placed closer to the extreme of function over aesthetics where either 1) the recycled material comes from a document and the blank dorse is placed facing the outside of the volume or 2) the side of the manuscript facing the outside of the volume once contained text but now has been erased or intentionally discolored. The latter is the case with the binding of Beinecke Library Zi 5451, which contains a copy of a work on charity, *Pro Monte pietatis consilia, sive, Quaestiones super mutuo judaico et civili et divino*, printed in Venice in 1498 by Johannes Tacuinus. Interestingly, this imprint that argues against usury and the practices of Jewish moneylenders is bound in a leaf of a Hebrew manuscript [Figure 3]. Although the leaf appears to have been deliberately erased, it is still partially legible, certainly to the extent that the writing is recognizable as Hebrew. The leaf is even oriented so that the text reads properly from right to left.[14] Still, it is tempting to read intention behind the selection of this particular fragment as a wrapper for this particular imprint.

On the other end of the functional-aesthetic spectrum, binders clearly admired many recycled manuscripts for their artistry and their beauty, repurposing them in a way that highlights these features. Covers made from manuscript material often carefully align the text with the spine when possible, and in some cases, place a decorated or illuminated initial at the top left corner of the front board. Perhaps it is simply a result of the larger numbers of recycled liturgical books, but it seems that musical notation also held a special aesthetic value for binders. This may be partly due to the conventions of copying medieval music, as the use of red for staves and to indicate melismas in text underlay leads to a higher ratio of red to black in these manuscripts. On this aesthetic end of the spectrum, we might

first results", *Heritage Science* 11 (2023), 82; J.R. Duivenvoorden, A. Käyhkö, E. Kwakkel, and J. Dik, "Hidden library: visualizing fragments of medieval manuscripts in early-modern bookbindings with mobile macro-XRF scanner", *Heritage Science* 5 (2017), 6; T. Porck and I. van Kuijk, "Project Report: Medieval Fragments Revealed with FragmEndoscopy: A Pilot Project to Detect and Record Spine Linings with an Endoscopic Camera", *Fragmentology* 7 (2024), 123–134.

14 I am grateful to Malachi Beit-Arié and Sarah Ifft Decker for their help in examining this and other Hebrew fragments identified during the survey.

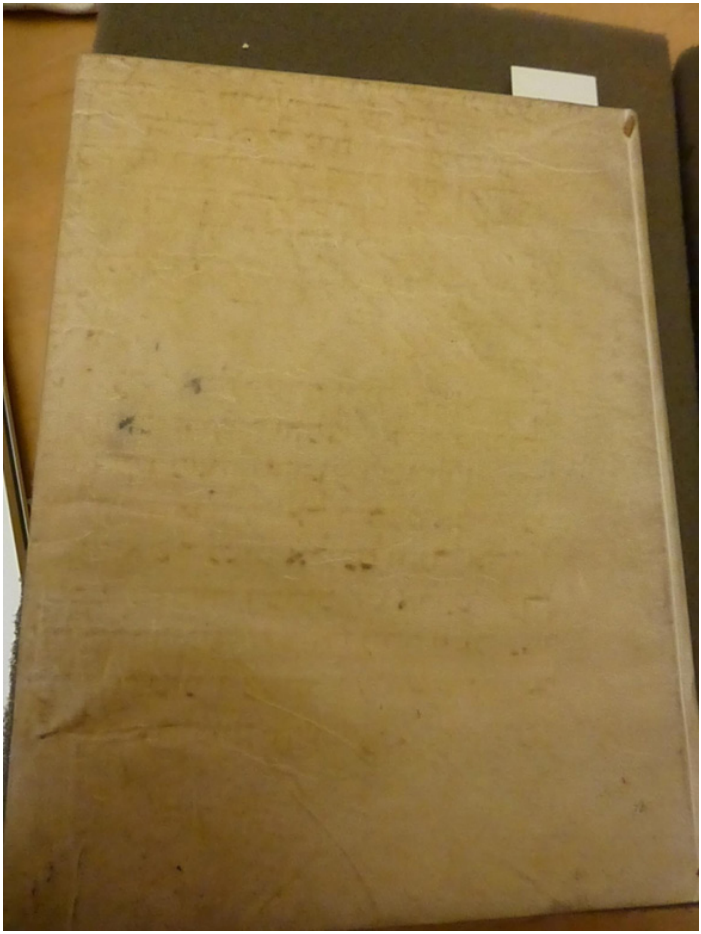

Figure 3: A Hebrew leaf used to cover Zi 5451, Beinecke Rare Book and Manuscript Library, Yale University

also place other examples where Hebrew fragments were used in bindings. In one case, ZZi 7537, fragments of a Torah were used as text guards and were trimmed only so that the endleaf matched the dimensions of the bookblock. That is, the binders seem to have purposefully left more of the parchment material in place and visible. Of course, there are other examples of text-hook endleaves, where a free flyleaf is secured around the outside of the first or final gathering of the volume, with a stub visible inside the bookblock, or

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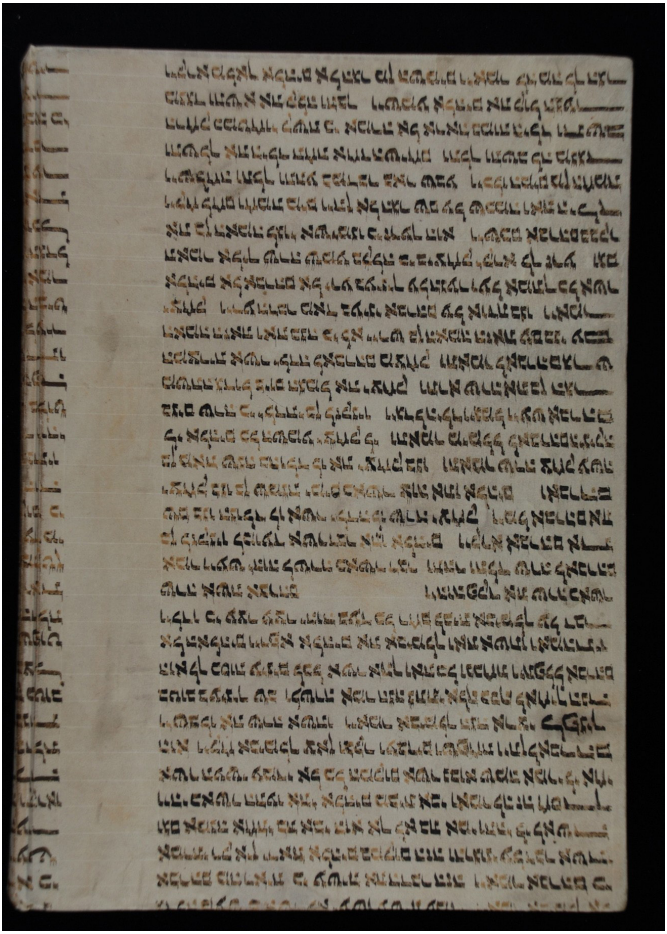

Figure 4: The front cover of Zi +3487.3 featuring an upside-down Torah fragment, Beinecke Rare Book and Manuscript Library, Yale University

where the text-hook endleaf also serves as a pastedown.[15] But there are also many examples of text-hook endleaves where the endleaves are trimmed significantly and then adhered to the board under a pastedown of paper or of other manuscript material. We might also consider as an example of the aesthetic reuse of binding material the case of another Torah fragment used as a wrapper, this time with the text facing outward [Figure 4]. In this volume, Zi +3487.3,

15 On text-hook endleaves, see *Language of Bindings* (http://w3id.org/lob/concept/1662).

a binder has carefully placed a Hebrew manuscript so that the edge of the written area aligns with the outer hinge. However, the binder, who could not read Hebrew, could not distinguish between the double justified edges of the written area and ultimately placed the writing upside down. These examples are perhaps a testament to the interest that these fragments—and maybe even Hebrew characters themselves—held as visual artifacts. At the same time, they raise uncomfortable questions about the dismemberment of Torah scrolls—which would not typically be recycled for binding materials by Jewish communities in the way Bible fragments might be used to Christian ones, but would have been disposed of through ceremonial burial—and the relationships between Christian and Jewish communities, including late-fifteenth century pogroms.[16]

We can extend considerations of legibility to the fragments of Latin alphabet scripts as well, given that binders opt in almost all cases to orient pastedowns legibly, or with the top of the manuscript leaf placed toward the head of the volume. Exceptions occur when the size of the imprint exceeds the size of the *codex discissus*, in which case often a manuscript bifolium is opened and pasted such that the manuscript text is perpendicular to the printed text. In attending to binders' choices in these cases, we might note whether there is directional continuity across the volume's in situ fragments, or whether on either side of the volume, the top of the manuscript bifolium is oriented toward the gutter or toward the fore-edge. In any case, the fact that binders, when possible, place manuscript fragments in ways that make them legible might suggest that binders as a general rule are literate artisans and perhaps that some are involved in other areas of bookcraft. A larger sample size of early bindings will be the testing grounds for such a hypothesis.

Having made these general observations about the surveyed in situ fragments, I now want to turn to a few volumes that illustrate more unique cases and, thus, potential avenues for further study. First among these is an unusual binding technique in an

16 On the use of Hebrew binding fragments, see A. Lehnhardt and J. Olszowy-Schlanger, eds., *Books within Books: New Discoveries in Old Book Bindings*, Leiden 2013. On the question of Torah fragments in bindings, see in particular the contributions by Campanini, Lehnhardt, Kogel, and Visi and Jánošíková.

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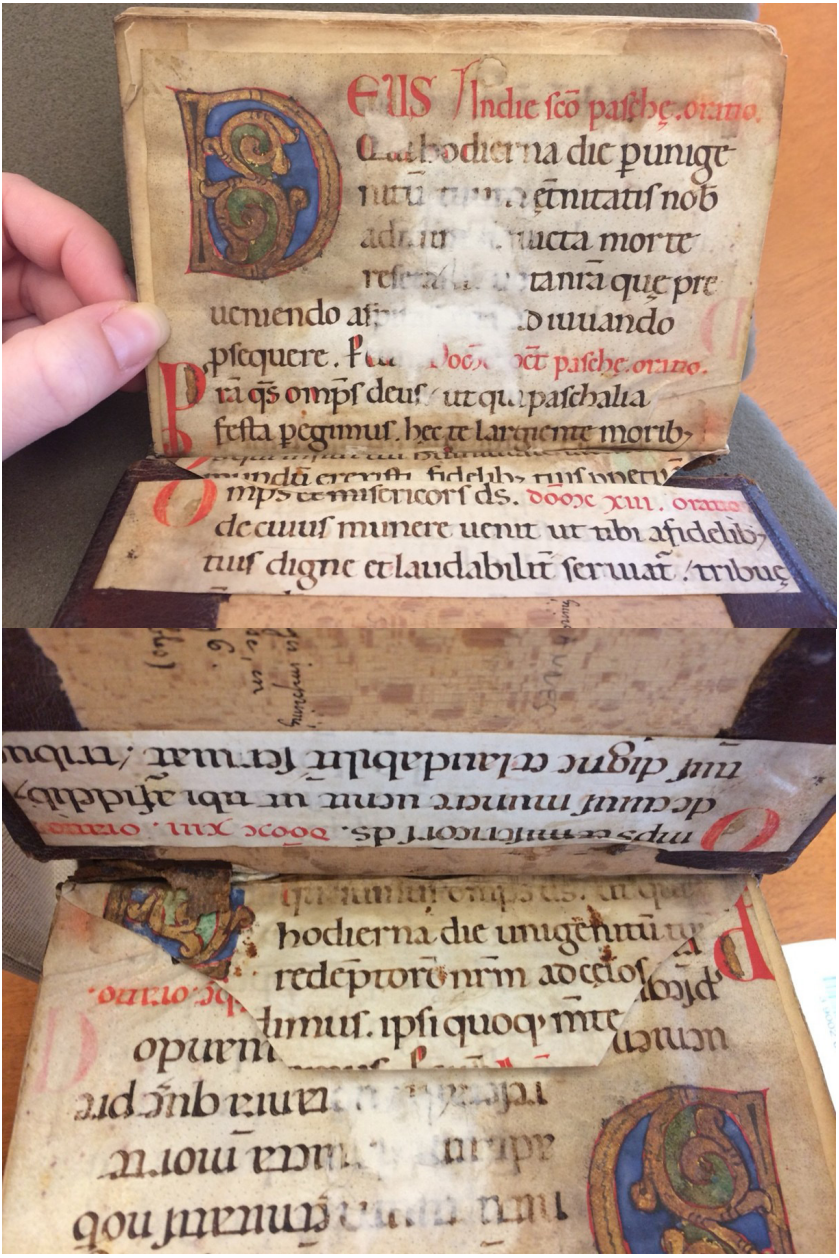

Figure 5: The unique tucked endleaves of 1988 834 with ink discoloration, Beinecke Rare Book and Manuscript Library, Yale University

octavo volume containing two titles, both printed in Venice in 1496: Beinecke Library 1988 834. In this volume, leaves from a beautiful, small format, twelfth-century Italian collectar have been turned perpendicular to the volume and folded widthwise to create endpapers. Instead of the more typical configuration of a conjoined flyleaf and pastedown, in this case the outer endleaves are trimmed into a lozenge shape to be tucked under a strip of parchment from the same manuscript—possibly a strip from the same leaf—which is adhered to the board only at the top and bottom [see Figure 5]. This arrangement protected and preserved a green paint color in a vine initial on the outer endleaf stub, where the green paint on the flyleaf vine initial has become significantly darkened by exposure. A similar tucked endpaper arrangement, particularly in another northern Italian volume, would immediately suggest the same binder or another from the same workshop, given the unique nature of this creative endpaper structure.

The oldest fragment identified in the survey, briefly mentioned above, was used as a wrapper over a Venice 1471 imprint of Leonardus de Utino's *Quadragesimale aureum* printed by Franciscus Renner de Heilbronn. The binding itself is more recent; it could be as late as the early nineteenth century, based on the use of Florentine paper and the condition of the wrapper. Certainly the paper was added at that time. The cover of Zi +4153 comes from a manuscript Bible dating to the late tenth or early eleventh century [see Figure 6]. The very measured Caroline minuscule has some beautiful early letter forms and abbreviations, such as the e caudata, the capital a, and the r of "Princeps" in column b at the top of the front cover. The *codex discissus* was a large volume, as this single leaf was sufficient to wrap around the boards of the quarto imprint. Visible on the cover are parts of the book of Job chapters 28, 29, and 30. The rubric on the back board is the first verse of chapter 29. The first verse of chapter 30 (*Nunc autem deridunt me iuniores temporum*…) in the second column, is, strangely, not rubricated. There is some discoloration present on both sides of the cover on the side nearest the hinge. This discoloration is due to a spine wrapper of Florentine endpaper material, remnants of which are still visible inside the boards. For such an early manuscript, the ink is incredibly well preserved.

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Figure 6: A Bible leaf from the turn of the eleventh century used to wrap Zi +4153, Beinecke Rare Book and Manuscript Library, Yale University. From top to bottom: front cover, spine detail, back cover.

Indeed, the most significant damage to the parchment and to the writing is from the nineteenth-century paper that formed a sort of quarter binding. It is truly rare to find manuscript fragments this early in North America, let alone in such excellent condition. And it

is remarkable if indeed the leaf was repurposed in the modern era. If other leaves survive and were within reach of the same binder, they will certainly be easily identifiable through the early hand, the prominent featuring of the manuscript material on the volume's boards, and—if truly the work of a modern binder—the Florentine paper.

Finally, the Beinecke incunabula bindings contained numerous twelfth-century liturgical fragments from Austria and Germany, which are a strength of the manuscript collections of the Beinecke in general. One of the most surprising finds of the survey was an offset on the back board of a volume printed in Augsburg in 1471: Zi +1525. Lisa Fagin Davis identified this offset as belonging to a leaf of the Gottschalk Antiphonal, a manuscript produced at Lambach abbey which she has reconstructed [F-75ud] and published on extensively. She has also reported this particular offset already.[17] Nevertheless, I mention this example again because the volume is an incunable that came to Yale as a gift in 1965—that is to say, via an entirely different route than the dozens of other Lambach Abbey fragments that are found among the Beinecke manuscripts.[18] This volume bears provenance marks of the monastery at Scheyern and two private collectors who owned it before it came to Yale. This item is thus a perfect example of both the contingencies of collection formation as well as the promise of studying binding fragments both in and ex situ for the provenance information that they provide, each and together.

The particularity of North American rare books collections such as that of the Beinecke Library is that they have been formed piecemeal over time, constrained sometimes by import and export licenses, shaped by curatorial strengths and interests. By contrast, British and European collections may comprise whole or partial monastic and aristocratic libraries, offering collections cohesion and acquisition patterns that are entirely different in nature. These kinds of collections allow for the detailed study of individual monasteries and their scribal practices and textual traditions, of regional

17 L.F. Davis, "An Echo of the Remanent", *Florilegium* 35 (2018), 5–30.

18 See R.G. Babcock, *Reconstructing a Medieval Library: Fragments from Lambach*, New Haven, CT, 1993; and L.F Davis, *The Gottschalk Antiphonary: Music and Liturgy in Twelfth-Century Lambach*, Cambridge 2000.

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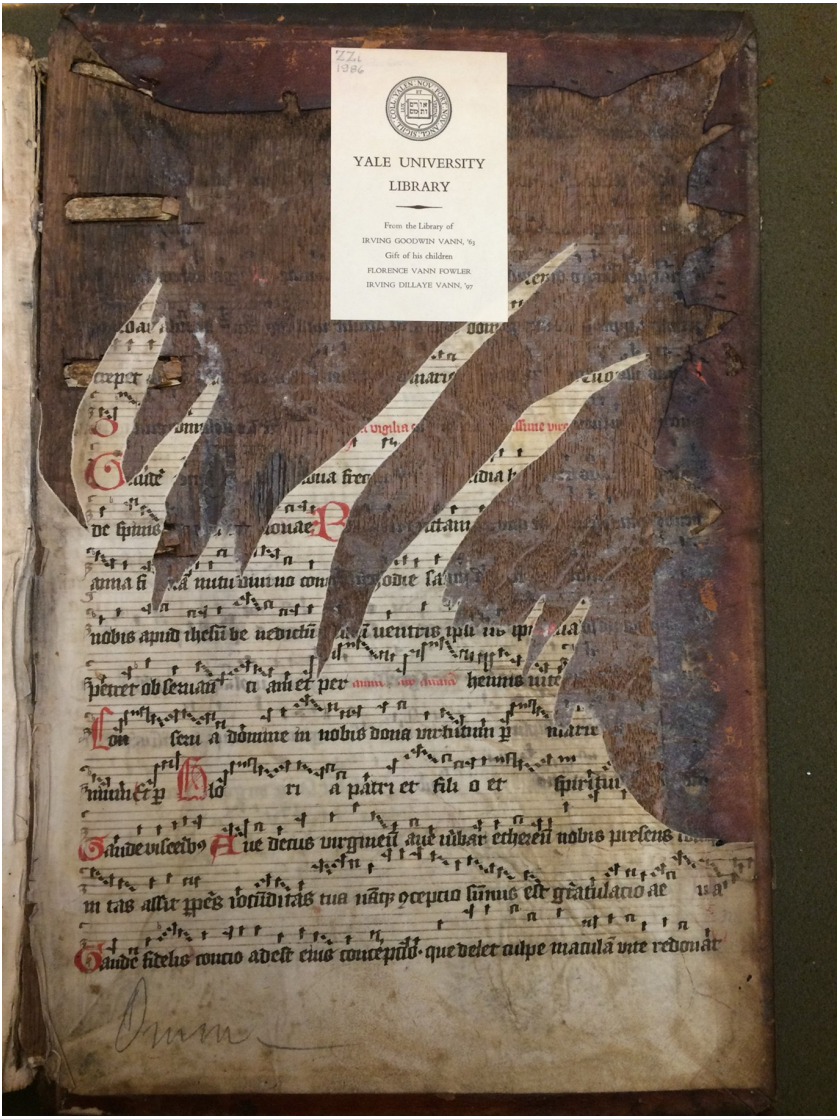

Figure 7: An antiphonal leaf used as a pastedown in ZZi 1986, Beinecke Rare Book and Manuscript Library, Yale University. An attempt to remove the pastedown from the back board has shredded the parchment.

scribal and illumination techniques, and so many other localizable practices in premodern bookcrafts. In the context of binding fragments, binders often used bits of the same manuscript for multiple

volumes. In monastic binderies, an entire *codex discissus* might live on by its use in the bindings of dozens of other volumes, a fact which allows for the substantial reconstruction of that *codex discissus*. Indeed, this was the case for the abbey library at Lambach. Yet this kind of reconstructive study is more difficult in the US because of the eclectic nature of American institutional collections, the aleatory way that materials made their way across the Atlantic, and the shifting vagaries of the auction, rare book, and antiquarian markets that provide opportunities for the sale and acquisition of early books. At every change in custody, a book with in situ fragments might be rebound or repaired—such as replacing a partially lifted manuscript pastedown with a fresh paper one—to meet the needs and expectations of the market. In some cases, dealers themselves may have removed binding materials for their own purposes. The back board of ZZi 1986 testifies, it seems, to an attempt to remove a manuscript pastedown that was still well adhered to its host volume [Figure 7].

Collection-level binding surveys have been undertaken at the University of Notre Dame, the University of Texas at Austin, Harvard University, and the Library of Congress (ongoing). Aside from UT Austin, I am not aware of collection-level data about the results of these surveys.[19] For this reason, the results of the Beinecke incunabula survey are a case study for the way in which they offer a large-scale overview of the incidence of in situ fragments in such a collection, and for how they might also suggest, in type and in number, the kinds of manuscript fragments to be found in other North American collections. The present article will serve, I hope, as an important first benchmark of the incidence rate of in situ manuscript binding material in North American incunabula collections, and it will be interesting to see how that benchmark will be adjusted as more binding surveys are completed and more data compiled.

As Husby's work suggests, other collections of early print materials—even on the campus of Yale University—deserve further attention. In 2017, in addition to the survey I conducted at the Beinecke Library, I also surveyed hundreds of incunabula in the Medical

19 M. Erwin, "Fragments of Medieval Manuscripts in Printed Books: Crowdsourcing and Cataloging Medieval Manuscript Waste in the Book Collection of the Harry Ransom Center", *Manuscripta* 60 (2016), 188–247.

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Historical Library at the Cushing/Whitney Medical Library at Yale. Those 307 volumes included thirty-three volumes containing fragments from forty different original manuscripts, an incidence rate of binding waste of over 10% for the incunabula in that smaller collection. Hundreds of additional incunabula are held in the Yale Center for British Art and the Lillian Goldman Law Library. As I mentioned above, manuscript fragments were used in bindings across a wide chronological range, and so they might be found in any handmade bindings from the Middle Ages to the modern era. During work in the stacks of the Beinecke pulling volumes for this survey, I compiled an additional list of some forty volumes with binding waste visible on the outside of the volume, usually as a wrapper, of books printed in the sixteenth or seventeenth centuries. I have noted still others, contained within the bindings of medieval manuscript books. A catalogue search shows that the Beinecke Library holds at least 2,700 volumes printed in the sixteenth century, and 3,400 volumes printed in the seventeenth century that might be the object of a next phase of this survey. This is to say nothing of the more than 1,500 manuscripts held at the Beinecke. Where binding surveys have focused primarily on early print volumes, the systematic cataloguing of in situ binding material in medieval manuscripts themselves also needs to be part of the picture of binding practices, and may even provide points of continuity with the binding of incunabula and later print volumes. Binding surveys of all these types of materials across various collections will yield a great deal more information about binding practices and patterns. Indeed, in the course of a current grant project, my collaborators and I have encouraged partners to examine bindings in their collections. Partners have already identified more than 150 in situ binding fragments to date, with more certainly to come during the next three years of our work.[20]

20 *The Peripheral Manuscripts Project* [https://www.peripheralmss.org], PI: Elizabeth Hebbard; Co-PIs Michelle Dalmau (Indiana University Libraries) and Sarah Noonan (Saint Mary's College). This project was funded in a first phase by the Council on Library and Information Resources, and in its second phase, begun in September 2025, by the National Endowment of the Humanities. See, for example, a report on some binding fragments at our first-round partner, Xavier University: S. Noonan and A. Ryckbost, "The Manuscript Fragments of Xavier University", *Manuscript Studies* 8:2 (2023), 399–413.

Given the more than 19,000 incunabula currently in collections in North America, based on numbers self-reported by the institutions concerned, listed above, an incidence rate of books with in situ fragments of 8% still suggests more than 1,500 volumes containing binding fragments that remain to be identified and catalogued, and the *codices discissi* that those fragments represent, however many there may be, folded into our understanding of the medieval written record. Though data is not yet available on the incidence rate of in situ fragments within medieval manuscript codices, the survey of those volumes—which number more than 12,000 in North America—will certainly yield hundreds of additional examples. And of course, many of the single leaves and fragments in North American collections are ex situ binding fragments as well, either from host volumes in the same collection or from others. Every surviving offset, then, represents the possibility of eventually reuniting binding material and host volume.

In their sheer numbers, these in situ fragments can shift the picture of the material landscape of the Middle Ages. They represent enormous research potential in liturgical studies, the history of libraries, our knowledge of bookbinding crafts, and in our understanding of the parchment trade. On this latter point, in situ fragments demonstrate the mobility of both manuscript and printed texts in the late medieval period. Volumes that house together printed bookblocks, binding techniques, and manuscript materials that originate in disparate geographic spaces are particularly suggestive of an economy of fragments and trade in parchment from discarded books. Moving beyond the analysis of individual volumes, more data on in situ and even ex situ fragments where they can be identified with their host volumes, will allow us to describe with more nuance how, why, and where manuscripts are recycled. It makes sense that, during the Reformation, we should see an increase in the number of liturgical manuscripts that get recycled within certain geographic parameters. It remains to be seen whether large scale in situ binding data will bear out this assumption. In the meantime, there are many more bindings to be examined and many more data points to be gathered therein.

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Appendix: Babcock Binding Fragments Updates

The purpose of this appendix is to provide additional identifying information about the volumes identified in Babcock's 1994 article, particularly the items' Beinecke call numbers.

Two of the items mentioned in the article, however are not in the Beinecke collections. The copies of Girolamo Giganti, *Tractatus de crimine laesae maiestatis* and Marco Mantova Benevides' *Enchiridion rerum singularium* that Babcock discusses are found in the Rare Book collection of the Lillian Goldman Law Library. At the time of Babcock's article, the Law Library rare collections were on deposit at the Beinecke. They were moved in the late 1990s after a renovation at the Law Library included a dedicated rare book room and vault storage.

The Giganti volume remains as Babcock described. The Benevides volume only retains one fragment in situ; the other three have been removed and housed separately. The change of state of this volume was apparently due to damage it sustained during the 2003 bombing of the Yale Law School, which affected the library facilities and collections.[21] I am indebted to Kathryn James for providing images of these two volumes as well as additional information about the Law Library collections.

Host Volume				**Fragment**		
Work	Printer	Year	Call number	Title	Dating	Comments
Girolamo Giganti, *Tractatus de crimine laesae maiestatis*	[none]	1557	Rare26 03-136	Virgil, *Aeneid*	First half of the 15th c	
Marco Mantova Benevides, *Enchiridion rerum singularium*	ad signum Putei [Bartholomaeum Caesanum]	1551	Rare26 03-164	Priscian, *Institutiones grammaticae*	Mid-12th c	Damaged in 2003; three of the four binding fragments are now housed separately

21 "Explosion at YLS", *Yale Law Report*, 50:2 (2003): 7–11.

The other items mentioned in the article are given below:

Host Volume				**Fragment**		
Work	Printer	Year	Call number	Title	Dating	Comments
Urbano Bolzanio, *Grammaticae institutiones ad Graecam linguam*	Aldus Manutius	1560	Gb5 557Bb	Cicero, *De oratore*, c. 54 & 55	15th c	Four parchment strips
Lettere di principi (in 3 vols.)	Giordano Ziletti	1575	Hd21 18L	Cicero, *De officiis*	15th c	In four strips, with illuminated initial
Marc Antoine Muret, *Variarum lectionum libri VIII*	Giordano Ziletti	1559	Gr12 M942 A1 1559	Virgil, *Aeneid*	Mid-12thc	The binding has since been removed and the manuscript fragments catalogued separately as 1993 1
Francesco Petrarca, *Sonetti et Canzoni*	Marcolini	1539	Hc53 41J	Livy, *Ab urbe condita*		Fragment contains text from the first Decade
Italian translation of Tacitus, *Le Historie Auguste di Cornelio Tacito novellamente fatte Italiane*	Vincenzo Vaugris	1544	Gnt1 ci544	Florus, *Epitome bellorum omnium*	14th c	
Additional items mentioned in Babcock, "Manuscripts of Classical Authors", n. 7:						
Rhetorica ad herennium and Cicero, *De Oratore*	Aldus Manutius (Sammelband)	1569	Gnc60 a554b	Medical treatise	12th c (?)	
Bernardo Segni, *Rettorica et poetica d'Aristotile tradotte di greco in lingua vulgare Fiorentina*	Bartholamio da Lodrone, Francesco Venetiano	1551	Gfa84 mi548B	Text on *amicitia*	15th c	Fragment consists of strips

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