

Acquisition, Collaboration, Teaching: The Role of the Beinecke Library in Driving Research

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For the best part of its history, the Beinecke Library, founded in 1963, concentrated on acquiring significant materials that would expand the frontier of human knowledge. It has also made it possible for scholars to locate those materials by providing exemplary finding aids such as catalogs, inventories and other bibliographic tools. At the turn of the twenty-first century, under the direction of Frank Turner, and then following his passing under E.C. Schroeder, the library repositioned itself as more than a repository of useful material for scholarship. Instead, the Beinecke sought to actively engage scholars, students, and the general public through exhibits and classroom teaching and by harnessing the power of some of the new digital technologies. The relationships among people and organizations such as libraries and universities fuel the vitality that gives the Beinecke a palpable sense of energy apparent to anyone who has visited or worked there. This essay will delineate the library's history and discuss the new programs that make the Beinecke such a unique institution.

The Beinecke Library opened in 1963 and celebrated its fiftieth anniversary in 2013. The anniversary provided an opportunity to look back at the library's founding and transformation through its relatively short history. Even those who have little knowledge about the Beinecke as an institution might still recognize its iconic building and adjoining sculpture garden designed by Isamu Noguchi (1904-1988). Every year roughly 170,000 tourists flow through the Beinecke's single revolving door to stand in awe before the stunning glass-enclosed book tower and marvel at the quality of light transmitted through the building's marble "windows." The building's architect, Gordon Bunshaft (1909-1990), was famously reticent when it came to discussing what he was trying to achieve with his design, but for many the building and the book tower appear to be a jeweled box celebrating the raw beauty of the books, which were rarely on display in modern libraries and never literally at the heart of the building. In much modern architecture it can be difficult to distinguish the use of the building from the outside; one never mistakes the Beinecke for anything other than a library.

In addition to the book tower, tourists are encouraged to view the constantly changing exhibits that are found in two large cases on the building's ground floor and eighteen smaller vitrines that line both sides of the top floor. Two magnificent curved cases were added at a later date; their position at the top of the stairs draws visitors up to view the materials. The library mounts three exhibitions every year; all attempt to reach beyond the university's walls to welcome the larger public to share in the enormous wealth of materials and learning on display there. Two permanent exhibits draw international visitors: the elephantine two-volume folio edition of John Jay Audubon's *The Birds of America* (1827-1838) graces the south side of the mezzanine, while the Gutenberg Bible occupies a shrine-like case on the north side of the book tower. If the library can be thought of as a cathedral, with its tremendous vertical space, the case that contains the Gutenberg Bible resembles a massive reliquary, a medieval sculpture that accents the importance of the saints' bones held inside with clear

sides that enable the “relic” to be viewed from all angles. Like a reliquary, the Gutenberg case has a label indicating what relic is enclosed because bones and books can be difficult to distinguish without labels. I don’t think the religious appearance of the Gutenberg case is a mistake; the 42-line bible occupies a unique position in human history as the first printed book in aurope, although obviously not the first printed material. That distinction belongs to the Empress Shotoku’s printing in 770 of one million copies of the *Hyadumanto Dharani*, each of which was placed in a miniature pagoda.¹

In Bunshaft’s original design of the Beinecke, there was a large reading room, as there is today, and a large anteroom that used to contain the massive card catalogs that were previously necessary for locating information in the building’s collections. In the 1990s, with the card catalog online, the cases were removed. and room was made for tables for scholars to work and consult with students, curators, and library staff. Interestingly, the original plan for the building did not contain any classrooms, but only small rooms designed for groups of five or six people at most to consult and discuss materials. In the 1980s, two medium-sized classrooms were created that could be joined to make a large meeting room, but it was clear to all who worked there that the Beinecke, as a building, was not intended for undergraduate or even graduate instruction.

This changed in the 1990s as scholars began to rediscover the material objects that transmitted texts and began to explore the history of these objects and how a multitude of factors influenced what materials survived and in what form. Rather than a Darwinian survival of the most important pieces of literature, we are now confronted with a more chaotic and random survival of materials, whose existence was often due not to the importance of the text, but to the value of the beautiful illuminations that accompanied the text or the jeweled binding that protected it. Some survivals were mere chance and not the result of any conscious decision to preserve a text. Through researching the objects, scholars would rediscover the importance of that text and eventually work to understand the synthesis of text and image that motivated the original patrons who paid to create the book and the many hands that preserved it over many centuries, each of whom may have had very different motivations for preserving the material.

The building was transformed in 2015 when as part of a larger renovation project, significant additional classroom space was added to the building by relocating the cataloguing unit to another building on Yale’s campus and opening up two large new classrooms and several smaller classrooms. The Beinecke has 170 class sessions, most composed of faculty demonstrating rare books to undergraduates and graduate students; we also offer ten to twelve semester-long classes each year and a sizable number of summer programs in book history.

The transformation in the role of the Beinecke on campus has been accompanied by another revolution that is currently remaking the study of historical materials. This is the incorporation of the new digital tools that make up what has been called the “digital humanities.” This is a useful catchall for many different ways that science has impacted the academic study of the book in the last generation.

The first generation of digital humanities, even before it was called that, was initiated by scholars such as Toshiyuki Takamiya, who as Director of Keio University’s Humanities Media

¹ Brian Hickman, “A Note on the Hyakumanto Dharani,” *Monumenta Nipponica* 30:1 (Spring, 1975): 87-93.

Interface Project (HUMI) was one of the leaders not only in making digital surrogates of important materials, but also providing for their wide and fair distribution. Both of these aspects of what we now call digitization were revolutionary in their time and forced libraries to reconsider how they made their collections available to the public.

Initially, there were a host of anxieties among librarians, curators and archivists about making digital facsimiles of their collections. Some curators worried about the hazards of photography and possible damage to fragile materials; Prof. Takamiya and others in his team developed special tables to gently support the books without stressing the binding, making it possible to photograph them without opening the book fully and without having to have the pages completely flat. Working with photographers and conservators in Japan, they developed methods that were gentle to the books yet enabled them to take high resolution photos that revealed as much of the page as possible. The second worry concerned distribution. If the materials were available online, some argued, then who would actually travel to the library to look at the original? This was a legitimate concern because part of the model that Prof. Takamiya advocated made materials available all over the world. Scholars in Germany were now able to view materials only held in Japan, and students in Africa were able to read books kept in North American archives. Ironically, digitizing the material also made locally inaccessible materials available to almost anyone: Scholars who had not been allowed to consult the original because of stringent restrictions, could now read books in their living room materials they were not permitted to examine down the street in their local archive.

But rather than creating a world where the original was unnecessary, this model created something very different and exciting and something perhaps not even envisioned by its creators. Seeing manuscripts online made people want to see the original even more than they had in the past. Perhaps it was the limitations of photography, or the fact that so many manuscripts could be found that were previously inaccessible or even unknown. Rather than a decrease in reading room visitors, there has been, at the Beinecke and at rare books libraries worldwide, a sharp increase in the number of visitors who want to work with the rare materials. Having discovered them online, these scholars saved many hours of work and were able to focus only on the most important, interesting or troubling aspect of the manuscript, which reduced the amount of time a scholar might need to consult the rare item itself. Scholars were also able to discover which books they didn't need to consult, saving the material from unnecessary handling.

The second generation of digital tools moves in a slightly different direction by increasing our ability to read books that have suffered damage through accident, acts of war, or simply from age. One of the most important of these new technologies is multispectral imaging.

The basic principle behind multispectral imaging is that different light waves reflect back different materials. The human eye is limited in what it can see unaided; the multispectral camera takes images in both ultraviolet and infrared, as well as spectra that the human eye can see, and then computers merge those images into a single image that dramatically enhances our ability to read it.

In 2013 at the Beinecke Library, Chet Van Duzer and a group called the Lazarus Project, now based at the University of Rochester, with a grant from the National Endowment for the Humanities, used multispectral imaging to allow text from the Martellus map to be read for the first time in hundreds of years. The Martellus map is a wall map of the known world in 1491 constructed by the

German cartographer Henricus Martellus. The map arrived at Yale in 1962, the gift of an anonymous donor. Five centuries of fading and scuffing had rendered much of the map's text and other details illegible or invisible, limiting its research value. While the outlines of the continents could still be made out, it was impossible to read most of the text on the map, which for historians was its most important aspect. Because of Martellus' fame as a cartographer and because of the date of the map, it is believed that this map, or one made from it, was used by Christopher Columbus when he sailed west in 1492. If we were able to read the text on the map, we might have a better idea why Columbus made some of the odd choices he did, such as exploring north and south when he found the island today called Hispaniola, rather than the more expected practice which would be to circumnavigate the island. Multispectral imaging might allow historians to recover the text of the map, but there were several impediments.

Because the map was so massive, and the camera needed to make multiple passes over the same a large scaffold was erected allowing the camera to move back and forth on a track capturing 55 different segments. Software provided by the Lazarus Project stitched the images together. Then, at a later stage in processing, different software was used to "guess" letters that had been abraded and were still unreadable. The map can now be read easily, and researchers have determined that the continent of Africa has areas that must have been transmitted to Martellus from native African sources, not from European explorers. It is also clear that Columbus thought he had hit the island nation of Japan, and because on Martellus' map Japan is oriented north-south, Columbus' decision to sail north and south to explore the island makes more sense.²

Another project to take advantage of multispectral imaging was the photo facsimile produced by Yale University Press of the famous Voynich manuscript. The Voynich Manuscript is an enigma wrapped inside a puzzle. Our edition sought to make available to both scholars and the general public a reasonable facsimile of the book, which is the most popular of all the materials searched for on the Beinecke's website. Because there are so many controversies about the authenticity of the book, which is thought by many to be a modern forgery, we conducted tests on the parchment and the inks. Carbon-14 dating of the parchment twenty years ago revealed that the materials were from the early fifteenth century. We repeated that test with similar results; we were further able to determine, through DNA analysis, that the parchment was calf. More importantly, we were able to use raman spectography to examine the composition of the pigments used in the manuscript. The inks had been tested in the past, but technology at that time limited the testing to just a few sites on the page. Using more robust testing we were able to examine the pigments on many pages and discovered that all of them were materials that were widely used in medieval Europe; there was no trace of any modern pigments. The Voynich is still an enigma, but it is clearly a medieval enigma, not a modern one.

More recently we have had the opportunity to research another well-known item in our collections, in this case proving beyond a doubt that it was a forgery, not a medieval product as it claimed to be. The Vinland Map was given to Yale in 1965 by Paul Mellon, the map purports to represent not only the known world from the time before Columbus, but it also contains the only

² Chet van Duzer, *Henricus Martellus's World Map at Yale (c. 1491): Multispectral Imaging, Sources, and Influence* (Springer, 2019).

depictions of Greenland, Iceland, and the East Coast of Newfoundland. We have known since the map was acquired that it was based on a map made by Andrea Bianco in 1436. Recent historical investigations by John Paul Floyd have revealed that the Vinland Map is actually based not on Bianco's 1436 map, but on a printed facsimile map made in 1782. Floyd discovered this by noting mistakes in the 1782 map that were replicated on the Vinland map, but could be found nowhere else.

But many historians and scientists were more concerned with ink analysis. In 1972, the McCrone Group in Chicago discovered a modern form of titanium in the ink used in the Vinland Map. Because this form of titanium was not produced until the twentieth century, it seemed that science had proven the map to be a forgery. However, several other scientists contested these findings, arguing that the samples had been contaminated. Because McCrone was limited to a probe, his group was only able to sample a few small sections of the map. Using new technology, we discovered that titanium was found in every area of the map that used ink. In the case of the Vinland map we were able to prove the opposite of what we found with the Voynich manuscript; the Voynich was clearly a fifteenth century manuscript, while the Vinland was clearly a 20th century fake.

Another aspect of the digital humanities that we are pursuing at the Beinecke involves the instruction of graduate students using the traditional tools of paleography combined with the new markup language XML, in workshops in which advanced graduate students instruct other students, enabling them to take the methods back to teach to students at their home campuses. The impetus for this program, which we call Digital Rolls and Scrolls, came about because of the relationship between the Beinecke and faculty and students at Keio University.

In the summer of 2015, Diane Ducharme and I taught an intensive summer Latin Paleography class at Keio University in Tokyo, Japan. In addition to the digitized materials we brought, Takami Matsuda, the professor in charge of the seminar allowed us access to the rich holdings of Keio University Library's Rare Book collection. This collection was greatly expanded in the 1980s because of the strength of the Japanese economy, which was doing well enough that public universities could purchase medieval European materials. Equally important, they were advised by Toshi Takamiya, whose collecting we celebrated in 2017 with a building-wide exhibit at the Beinecke Library. While they have an outstanding teaching collection with many single leaves and several impressive codices, Diane and I were drawn to the three long sheets that had once been sewn together to form a roll cartulary. While we didn't have time to study the cartulary in place, we agreed to use it as a shared resource the next year when we would offer paleography in New Haven and Takami Matsuda would offer paleography in Tokyo.

The membranes are heavily decorated for a roll cartulary, the primary virtue of the roll form being its "cheapness" compared to a codex. While this level of illumination isn't lavish, it is quite striking for a roll cartulary and certainly not inexpensive to produce. The second virtue of the roll format is that it is easy to sew additional sheets as needed to extend the cartulary. This too was ignored by subsequent owners, with later text being entered on the back of the first membrane rather than appending a new piece of parchment. Perhaps the owner of the cartulary felt it was "finished" at three sheets and therefore entered text on the back, or perhaps he or she didn't want to pay to illuminate another.

At first, we thought that we would transcribe one section each week and then swap texts,

allowing one group to check the work of the other. We were fortunate that the cartulary contained both Middle English and Latin documents, so we started with the English to give the students the opportunity to master the hand before struggling with Latin vocabulary and abbreviations. Because these are charters, they repeat the boilerplate parts that were similar or identical to other charters having a similar purpose within the same cartulary. This facilitated reading additional text, but had the distinct drawback of introducing legal concepts and vocabulary that were strange and unfamiliar to most of the students in the class. Once we had read through the Middle English, we started on the Latin. Given the text's density, it was clear that we were not going to get through the entire cartulary, and in fact, as a group, were unable to complete more than two Latin charters.

Unlike many paleographical exercises that ask students to transcribe a text that has been copied many times before, this assignment held a sense of purpose in transcribing the document; students knew that another group was going to read, correct, and critique the work their group had done. Working this way, students were contributing to real scholarship, both in preparing, in part, a section of the cartulary for publication, and by researching the names, dates and locations that were being contested. Students also learned a significant amount about English "law on the ground": that is, they could see the nature of the dispute (inheritance of land) and the various arguments that were brought forth to prove a case. The cartulary demonstrated what counted as evidence and who was trusted to give testimony. Interestingly in the case of this charter, the fundamental difficulty the family of John Ramesey encountered was that at one point property had been passed down according to an oral rather than a written ceremony, and so the claimants had to recreate the oral promise by getting the parties present to testify about what was said many years before.

I hope these few examples have provided a sense of the many research activities we are currently conducting at the Beinecke. They reveal the importance of acquiring and maintaining rare books in university collections where new technology and a gathering of scientists, historians and conservators is able to drive new knowledge of old materials. The Martellus map provides new insight into how European explorers saw the world around them as they ventured to map it in the 15th and 16th centuries. The Voynich manuscript remains a puzzle, but at least we now know that it is a 15th century puzzle, not a 20th century puzzle. And the Vinland map has been revealed to be a forgery so that future cartographers will not have to account for this anomalous map purporting to show Vikings using graphic mapping centuries earlier than first thought.

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