

Reimagining Mount Holyoke's Past Through 3D Modeling



Samantha A. Malnati

Abstract



It is difficult to picture Mount Holyoke without thinking of its distinctive neo-Gothic architecture. Although this style plays a significant role in Mount Holyoke's current identity, the campus looked very different at its founding in 1837. Mary Lyon's vision for the layout of her female seminary depended on containing all aspects of campus life into one large, central building to promote order and discipline. The Seminary building underwent significant expansion in an effort to preserve Lyon's ideal as the student body increased in size over the years.

When the campus acquired collegiate status in 1888, this ideal shifted. Mount Holyoke adjusted its architectural layout in order to remain competitive with similar institutions, adding smaller academic and residence buildings such as Williston Hall and Rockefeller Hall. Over a span of twenty-six years, three fires resulted in the destruction of the Seminary Building, Williston Hall, and Rockefeller Hall. Although the fires had no casualties, the campus experienced a great loss to its architectural history.

Studying how the college's style and layout have evolved since its founding can give modern viewers a better understanding of Mount Holyoke's shifting priorities throughout the years. Though the physical structures which once comprised Mount Holyoke's campus may be lost, recapturing the experience of visiting these buildings is possible with modern technology. Archival photographs, building plans, and drawings which present a two-dimensional version of the past can be combined to construct a relatively accurate three-dimensional depiction of the site. This allows a viewer to virtually navigate the space and envision what it may have felt like to attend Mount Holyoke in the nineteenth century.

Although based on photographs, creation of the digital model depends on structural and historical assumptions. Images of the structures often deviate from what is recorded in the plans, and some information is missing altogether. Therefore, the model must be considered somewhat independently from the historical buildings. It represents a modern exposition of how a current Mount Holyoke student interprets the lost structures but should not replace the identity of the structure itself. The model should be used as a guideline for analyzing the architectural intentions of early Mount Holyoke, revealing how the architectural style contributed to establishing the school's reputation as an innovative, welcoming space for higher education.

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Undergraduate Thesis

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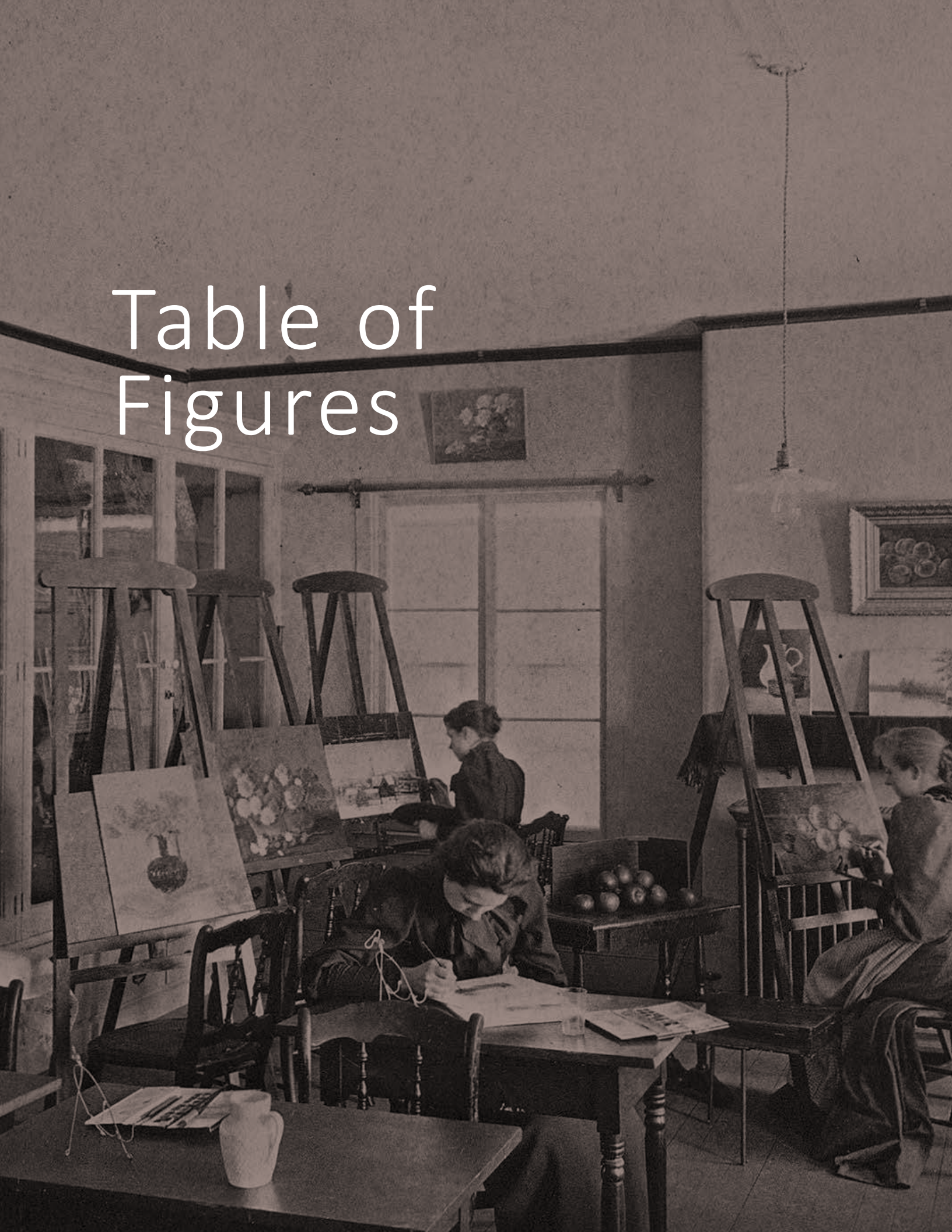


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Links



The reconstruction video can be found at:

<https://bit.ly/2Lr9rcX>

Rhino models of the buildings can be found at:

<https://bit.ly/2JfFmdu>

Collaborative updates and improvements are encouraged

Introduction



As a current student at Mount Holyoke College, my academic experience has been shaped by constant references to the campus' past. I walk past the grave of the school's founder, Mary Lyon, each day on my way to classes and activities. I deal with the frustrations of outdated heating systems in the older structures. I participate in yearly traditions such as Convocation, Mountain Day, and Pangy Day. As I sit in the distinctive library reading room to study, I listen to countless tour groups boast about our role as one of the first historically women's colleges. Despite the constant references to history which surround me, it is difficult to envision the campus as it existed at its founding, and the experiences of the original women who attended such an innovative institution.

Prior to my research, I often wondered how my path on campus mirrored those who had been here before me. Did the original students also take classes in Shattuck Hall? Could they see the same view of Skinner Green that I could see from my room? When my roommate in Pearsons Hall belted out hymns from a seat in her closet every morning and told me that they were so large because Mary Lyon wanted each student to have a private place to pray, I had trouble believing her. It was impossible for me to picture students in the 1800s curled up on the floor of that very same closet, praying as she did each morning.

When visitors learn that Mount Holyoke is over 180 years old, they often assume that the neo-Gothic structures have been there since its founding, due to their equally antiquated appearance. The fires which destroyed three of the original structures on campus are not common knowledge, and even less is known by current students about the lost buildings themselves. As I learned more about Mount Holyoke's past campus structure, I began to view the current campus in a different light. That seemingly irrelevant rock I walked past every day on the path between Williston Library and Abbey Chapel suddenly became a fascinating historic landmark. Could it be a remnant from the cornerstone of the original Seminary Building? Other questions like this began to emerge as I envisioned the rectangular structure of the Seminary Building on the modern campus. Did it extend all the way back to what is now Clapp Hall? Was there always a slight slope to the ground beyond the building or was the terrain artificially adjusted?

While considering the answers to these questions I began to rethink what it was like to walk through the campus at the time of its founding. My modern experience as a student at Mount Holyoke is considerably different from that of one of its first students. I will never truly feel the excitement, anticipation, and pride which the nineteenth century women may have felt as they walked onto campus, knowing that they were the pioneers of women's higher

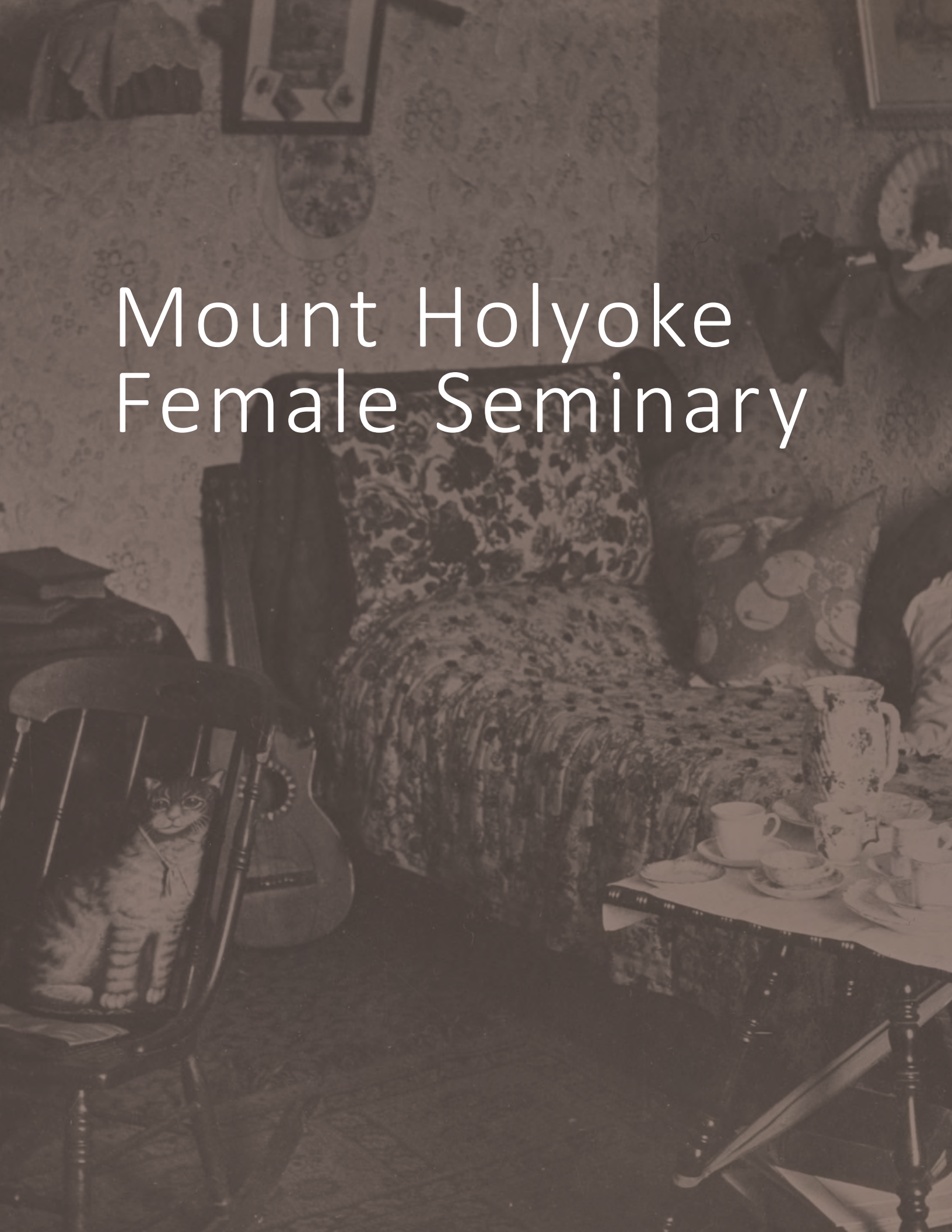
education. I will never be able to empathize with the experiences of Hortense Parker, the first African-American graduate in 1883, or Toshi Miyagawa, the first Japanese graduate in 1889, and their own unique views of the campus and its racial climate. These experiences inevitably shape the way the space is seen by individual students, making its exact likeness unattainable. Yet through studying the structure of the buildings and their positions on campus I can easily imagine the universally mundane experiences which make up life as a student. As I worked on reconstructing the wooden chairs within the lecture hall in Williston, I envisioned myself sitting



in those seats, doodling in my notes on the desktop attached to the arm of the chair, gazing out the window at Mary Lyon's grave in the distance, half-listening to the professor at the front of the room. When I hear of Mount Holyoke's rich historical significance now, I no longer have a fuzzy view of the students who first called this school their home. Now I can vividly picture the early structures on campus and the students who sat at one of those desks in Williston's lecture room. It is my hope that this project will be able to provide that understanding for all Mount Holyoke students and faculty who are interested in learning more about the college's history.



Mount Holyoke Female Seminary



In 1837, Mary Lyon founded an educational institution unique in both its concept and physical design. Mount Holyoke Female Seminary became a pioneer in women's education and influenced the creation of other historically women's colleges across the United States, such as Smith College and Wellesley College, both founded by Mount Holyoke trustees. To this day, the college's reputation as an esteemed and innovative educational institution is promoted in part through the imagery created by the architectural style of its campus. Photographs of neo-Gothic structures such as Williston Library or Abbey Chapel are used on much of the college's recruitment material, and the school's logo features a simplified, though distinctive, representation of the Gothic gates that mark the entrance to campus. However, the current campus differs greatly from its original design. Between 1896 and 1922, fires destroyed three buildings on campus, taking with them a piece of Mount Holyoke's history. Studying the intention behind the campus architecture and how it has evolved since the school's founding can be used to reveal differences in student experiences over time.

During a period when higher education was available only to men or to a select group of upper-class women, Mary Lyon envisioned an institution which could provide such an experience to women like herself who could not afford private, expensive schooling. In filling this gap, Lyon "saw [her] task primarily as professional preparation.... The female seminary took as its earnest job the training of women for teaching and for Republican motherhood".¹ Lyon also saw a vital benefit to scientific education, which was not normally offered to women at the time. Mount Holyoke's original curriculum required that students take seven courses in the sciences and mathematics for graduation. A chemistry teacher herself, Lyon encouraged her students to pursue careers in the sciences, such as teaching and research positions. In this way, Mount Holyoke Female Seminary represented a space for young women to explore academic interests typically unavailable to women.

Drawing on her religious background, Lyon's goals for Mount Holyoke centered around the enforcement of order, piety, and discipline. The regimented lifestyle and teaching methods of Mount Holyoke's early years produced productive, evangelical, and competent women, with 82.5% of graduates in the first decade becoming teachers.² The success of this new style of teaching depended on the physical structure of the building which housed the students and enabled them to achieve the level of studious discipline Mary Lyon intended.

1 Helen Lefkowitz Horowitz. *Alma Mater: Design and Experience in the Women's Colleges from Their Nineteenth-century Beginnings to the 1930s*, (Amherst, MA: University of Massachusetts Press, 1993), 11.
 2 Horowitz, *Alma Mater*, 27.

When Mary Lyon initially created the female seminary, its site in South Hadley, Massachusetts housed only seventy-seven students, two teachers, and a limited number of academic, dining, living, and working spaces. Unlike men's college campuses of the time, Lyon chose to house the entire school within a single building. This structure resembled that of inns, factories, or asylums, like the Connecticut Retreat for the Insane, where Lyon's sister was admitted in her youth. The asylum, located in Hartford, Connecticut, was built in 1822 as a single structure centered around a main corridor, typical of many nineteenth century asylum plans.³ This organization was a deliberate choice to uphold "the understanding that the correct environment could offer a solution for insanity... [by placing residents] in the relaxing setting of nature and the structure and discipline of asylum architecture and asylum life".⁴ Full immersion into the values and lifestyle of the institution was a strategy that Mary Lyon felt would be similarly effective in an educational setting.

Despite the evident similarities between asylum structures and Mount Holyoke's Seminary building, there is a distinct and significant difference when it comes to the buildings' exterior facades. Both buildings exemplify traits of Georgian architecture with simple and symmetrical exteriors, gabled roofs, large windows, tall brick chimneys, and centered entryways. But it is in the design of the entryway that the structures differ. Characteristic of traditional domestic architecture, the Seminary building features a large wooden, two-story porch surrounding the central doorway, marking the structure as a home rather than institution. Local residential architect, Chauncey Shepherd, designed and built the Seminary according to Mary Lyon's vision. The combination of residential and asylum architecture makes the Seminary building an effective space for both living and studying. Its homey qualities create a sense of community, while the regimented structure ensures that students cannot get so comfortable that they disregard the importance of their studies.

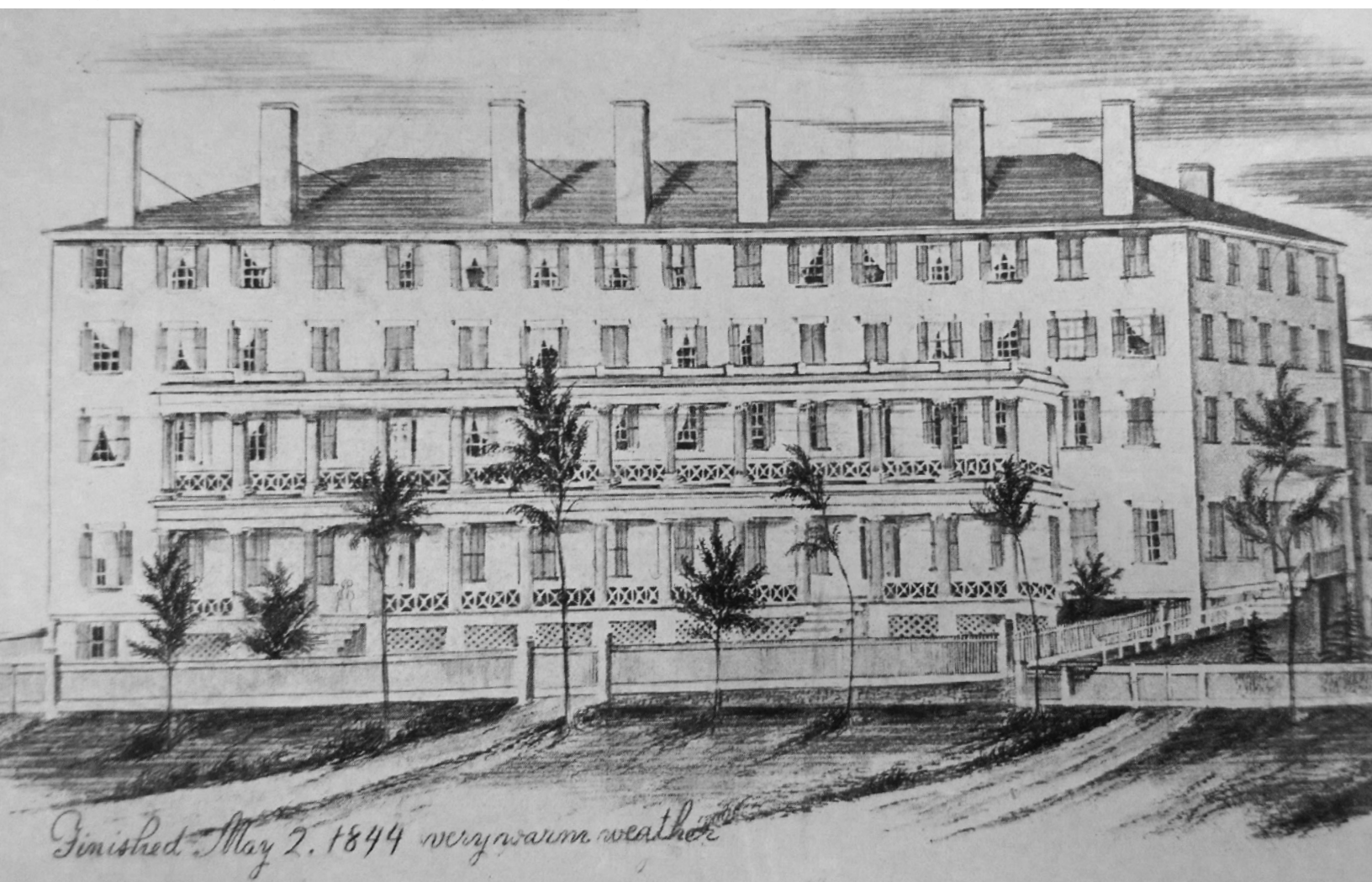
3 Lauren Hoopes. *On the Periphery: A Survey of Nineteenth-Century Asylums in the United States*. (Ann Arbor, MI: ProQuest LLC, 2015)

4 Hoopes, *Periphery*, 7.

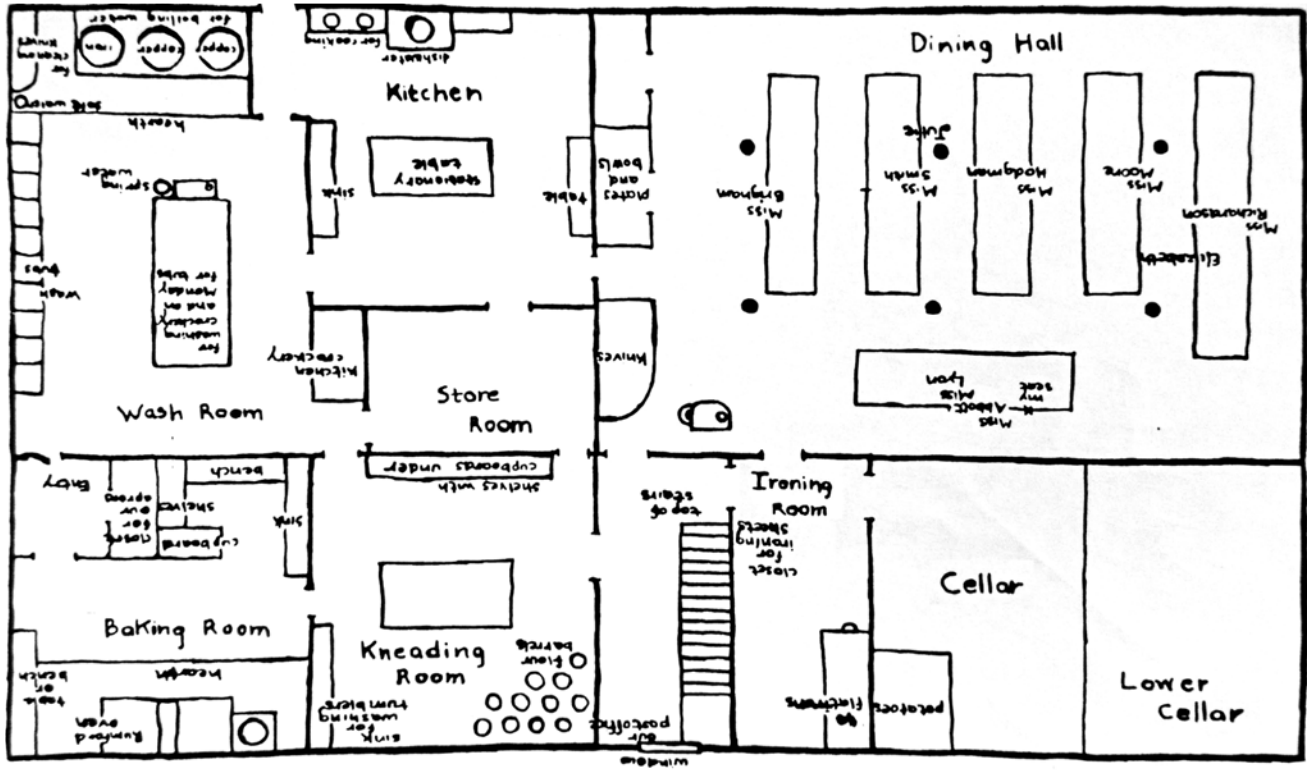


figure 1: Connecticut Retreat for the Insane, c. 1824 (above)

figure 2: Mount Holyoke Female Seminary building, 1844 (below)



BASEMENT



FIRST FLOOR

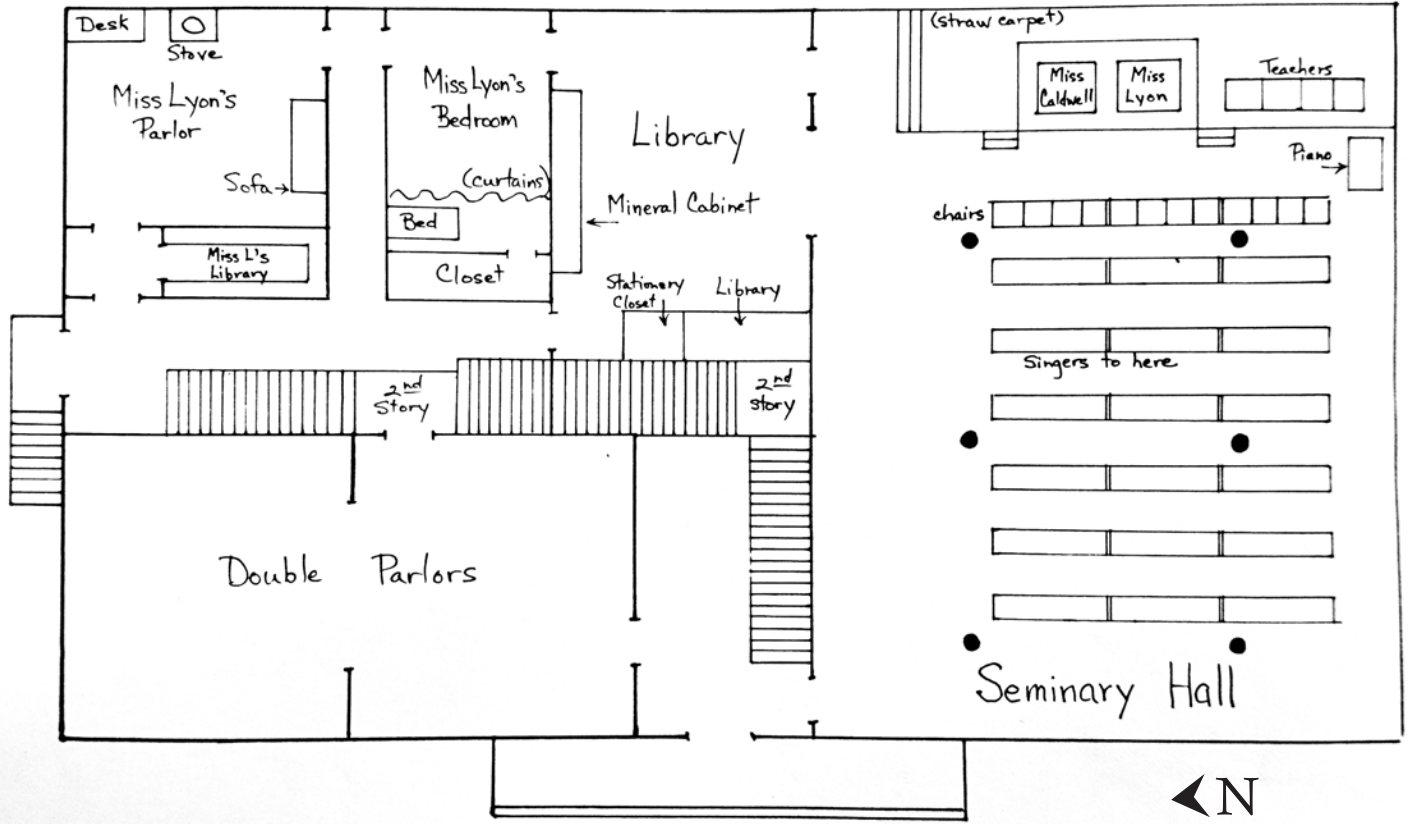


figure 4: Sketch of original Seminary building plan by Lucy Goodale, 1839

To the left of the first floor entryway, on the north end of the building, were a series of parlors for greeting guests to the Seminary. Although a welcoming space, the walls of these parlors were painted an austere white in accordance with Mary Lyon's preference for practicality and order. The south side of the building housed a large, equally plain room, with white walls and marble floors. Six rows of cherry desks with green lids and a single row of maple chairs were aligned to face a stepped platform where teachers and faculty sat.⁹ A doorway within this lecture room led to a library containing geological objects and stationery supplies. Walking past the library leads one to Mary Lyon's personal living quarters. The placement of Lyon's private living suite on the ground floor reflects the traditional location of a guest room within most New England homes, reaffirming the residential aspects of the building.

As more students attended the Seminary, the building required significant expansion to maintain Mary Lyon's desire for a single centralized structure. The primary rectangular form was lengthened on the south side and the porch extended in 1841. This renovation also included the construction of a 200 foot south wing housing additional residence rooms. Twelve years after the south wing's completion, a north wing was built to mirror its partner and create a central courtyard. The east end of this courtyard was sealed in 1865 by a large gymnasium and lower carriage entrance, leading to a wood storage area and boiler rooms. Adjacent to the newly completed quadrangle was a small library, built in 1870 and connected to the north end of the original structure by an enclosed corridor.

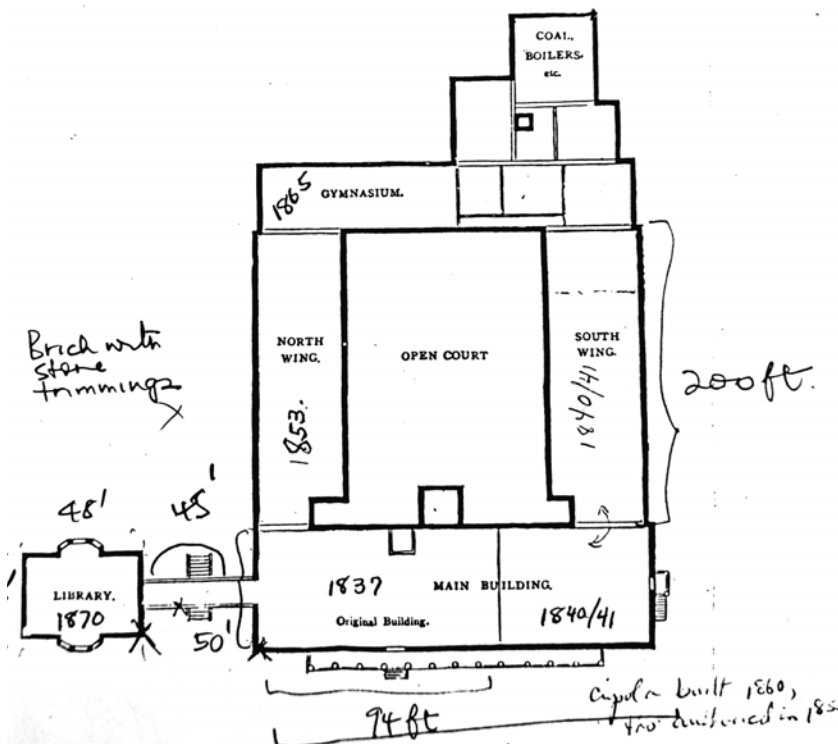


figure 5: Plan of Seminary expansion

The Seminary's small library was designed by Boston architect Hammatt Billings in a medieval style. Billings also designed Wellesley College's first structure, College Hall, in 1875. Destroyed by a fire in 1914, College Hall shares many similarities with Mount Holyoke's Seminary Building. Wellesley's founder, Henry Fowle Durant, took inspiration from Mount Holyoke's success and chose to house all aspects of campus life in a single structure. The Picturesque architecture of College Hall abided by similar principles of order and proportion as Mary Lyon's ideals. However, unlike the Seminary

Building, College Hall resembled a more grandiose style with spires, arches, and decorative Corinthian columns. This ornamentation reflected the preference for embellishment which defined many late nineteenth-century styles.



*figure 6: College Hall, Wellesley College, c. 1876
Photo accessed from Wellesley College Digital Archives*

As interior decorating trends evolved, so too did the originally modest, white walled Seminary building. The interior eventually changed to resemble a late Victorian style with vibrant colors, intricately detailed wallpaper, and patterned upholstery. Student rooms, such as the triple drawn by Elizabeth Landfear in figure 3, were highly decorated with paintings, photographs, rugs, and furniture. Despite Mary Lyon's desire for each student to have their own private space, Landfear's sketch shows that the space became quite crowded with multiple students sharing one room.

The growth of the campus and Mount Holyoke's collegiate charter in 1888 rendered the single-structure model outdated and inefficient as greater emphasis was placed on education rather than order and discipline. Other colleges at the time, like nearby Smith College which was founded in 1871, were structured around clusters of smaller buildings, each with their own unique functions. The wider range of educational facilities this type of clustered layout offered made other institutions more attractive to potential applicants. In an effort to remain competitive and accommodate their growing community, Mount Holyoke constructed additional academic buildings, such as Williston Hall in 1876 and Williston Observatory in 1881. Nevertheless, the Seminary building remained the focal point of campus until its destruction in 1896.

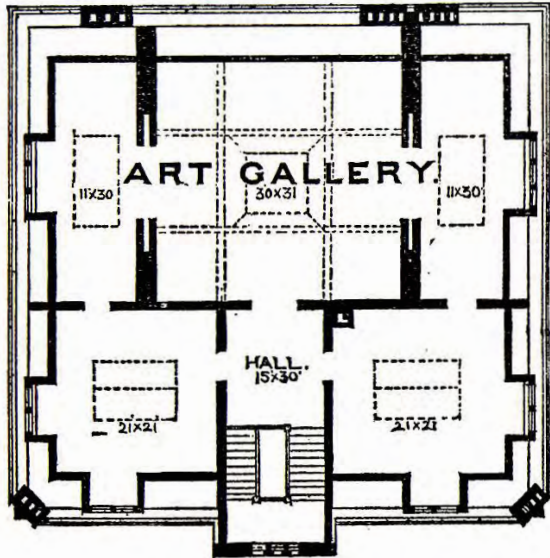


figure 7: Seminary General parlor, 1884

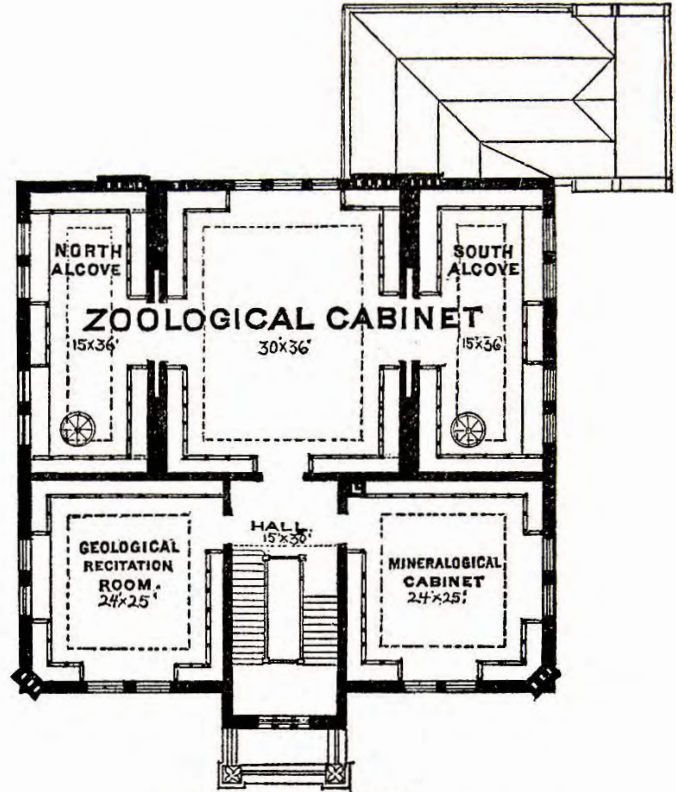


The Campus Expands

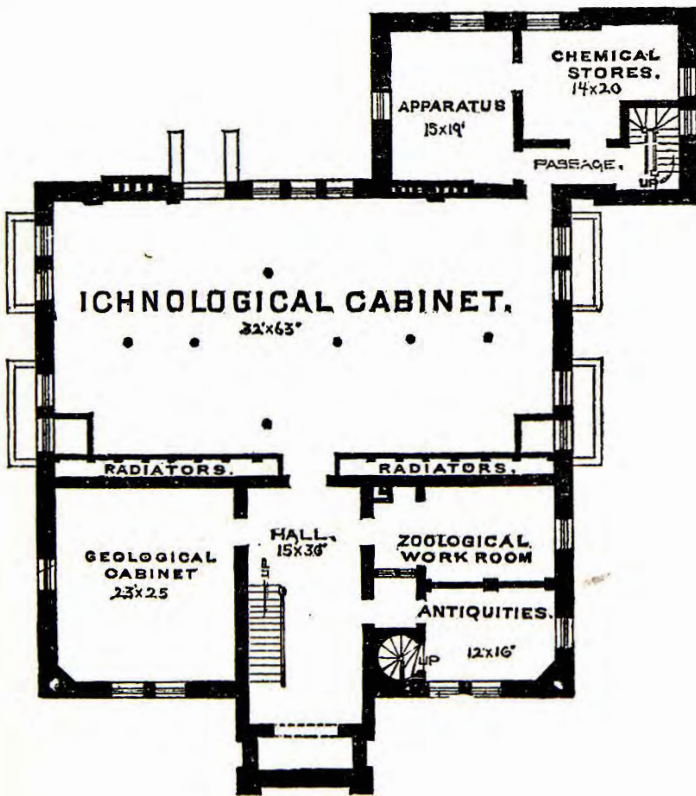
The humble Georgian architecture of the Seminary building was abandoned in the design of Williston Hall as the college moved toward a different visual ideal. In nearby Northampton, MA, the acclaimed architectural firm, Peabody and Stearns, built Smith College's first academic building in 1875. College Hall, which continues to mark the entrance to Smith's current campus, was built in a decorative, Gothic style to emphasize the elite education which takes place there. In an effort to replicate this ideal and compete with Smith, Mount Holyoke hired the same firm to design Williston Hall, built just one year later. Peabody and Stearns also designed an 1888 addition to the Seminary library in a somewhat Romanesque medieval style, with semicircular arches and corbel tables at the level of the roof eaves to match the style of the 1870 library. Peabody and Stearns also designed Williston Observatory, the oldest remaining structure on campus today.



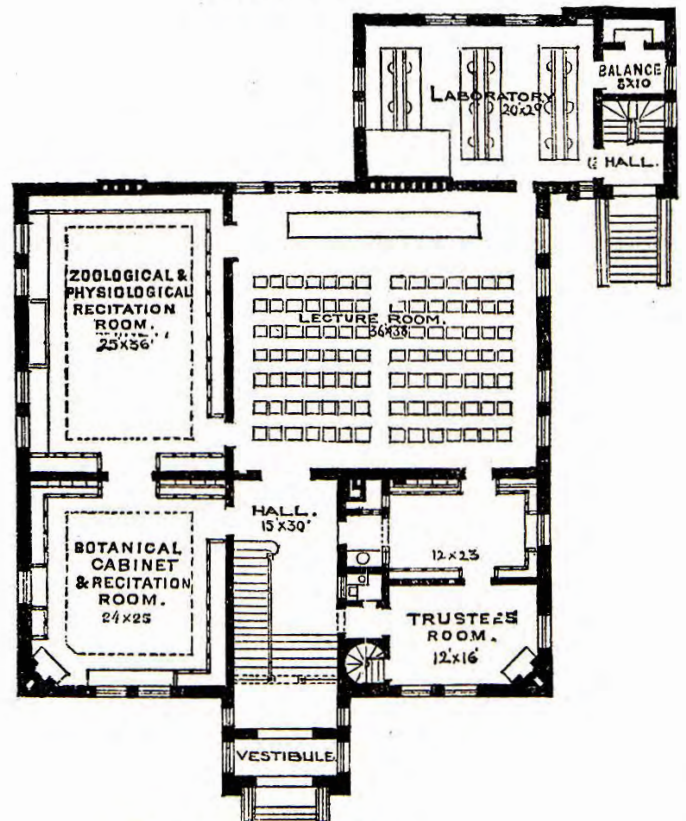
THIRD STORY PLAN.



SECOND STORY PLAN.



BASEMENT PLAN.



FIRST STORY PLAN.

figure 8: Williston Hall floor plans, Peabody and Stearns

The main door of Williston Hall opened into a double vestibule and spacious stairway. Beyond the hallway was a large lecture hall with tiered seating for ninety-eight students which faced a long wooden desk at the far end of the room. Botanical recitation rooms and specimen cabinets lined the north side of the building's first floor. The opposite side housed the trustee's room, likely used as a meeting place for trustees of the Seminary. A spiral staircase in the corner of the room connects trustees to the room of antiquities in the basement. Also found in the basement are a series of geological cabinets housing fossils of various sizes. Similar geological rooms comprise the second floor. Entered by way of the central staircase, double doors open to a 30 by 36-foot zoological cabinet, flanked by two small alcoves on either side. Recitation classrooms of 25 by 24 feet lead off of the main stairwell. A similar arrangement is found on the third floor, though the space is narrower due to the steeply sloped ceiling. The art gallery, inaugurated in 1876 with Mrs. A. L. Williston's gift of Albert Bierstadt's "Hetch Hetchy Canyon," fills most of the third floor. Each of the five rooms is illuminated by daylight with five large skylights, one in the center of each room.

The exterior of the building features typical Ruskinian Gothic elements, similar to the exterior of Smith's College Hall. Decorative polychromatic trim lines the brick buildings, creating varying textures to the facade. Ornate pillars surround the doorways, and the chimneys extend high at the corners of the structure. The heavy masonry is topped with steep gable slate roofs, giving the structures a grand, commanding presence. Pointed arches mark the central windows and doorway on Williston Hall and the bell tower on College Hall.

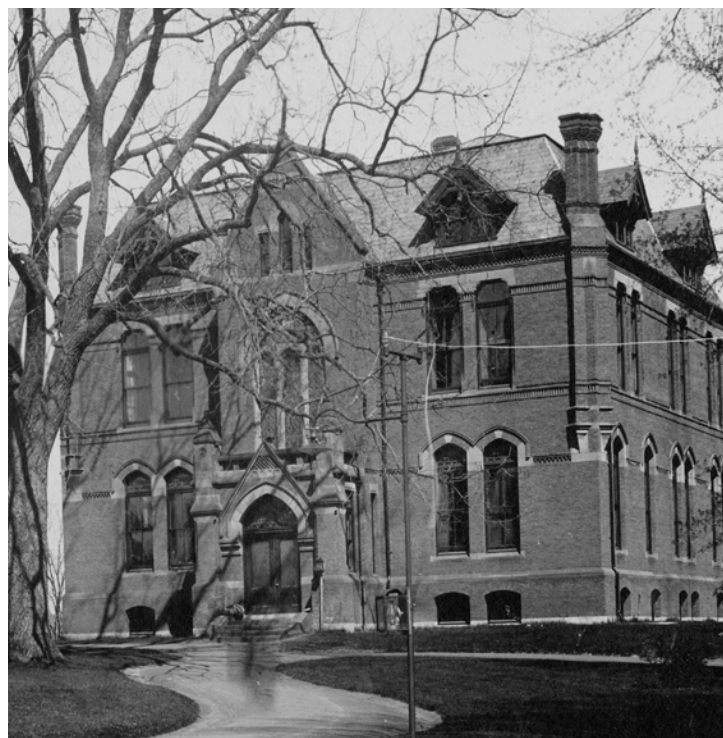


figure 9: College Hall, Smith College, c. 1900. Photo accessed from Smith College Archives (left); Williston Hall, c. 1876 (right)

The Gothic revival architecture of these buildings influenced the later designs of Brigham, Pearsons, Porter, Rockefeller, and Safford residence halls, which were all built in 1897 following the destruction of the Seminary building. Residence halls organized into clusters of smaller buildings allowed more freedom and leisure space for the students than was available in the Seminary building. The modern use of several specialized structures reveals the expanding curriculum and desire to promote the credibility of the campus as a competitive educational institution where a variety of individual disciplines can be explored. Mount Holyoke's evolving goals are evident not only in its achievement of collegiate status in 1888, but also in the visual layout of the campus' design. With the exception of Williston Hall and the original Rockefeller Hall which were destroyed by fires in 1917 and 1922, respectively, the other original Gothic revival buildings remain key elements of the campus' current architectural style. The three devastating fires allowed for a more intentionally designed layout according to Olmsted's plan, which emphasized the spacious campus and lush scenery. Meandering paths and garden spaces connecting each building are seen in figure 10 below. Both the layout as well as the cohesive use of Gothic architecture continue to serve as distinctive qualities of Mount Holyoke's campus today.

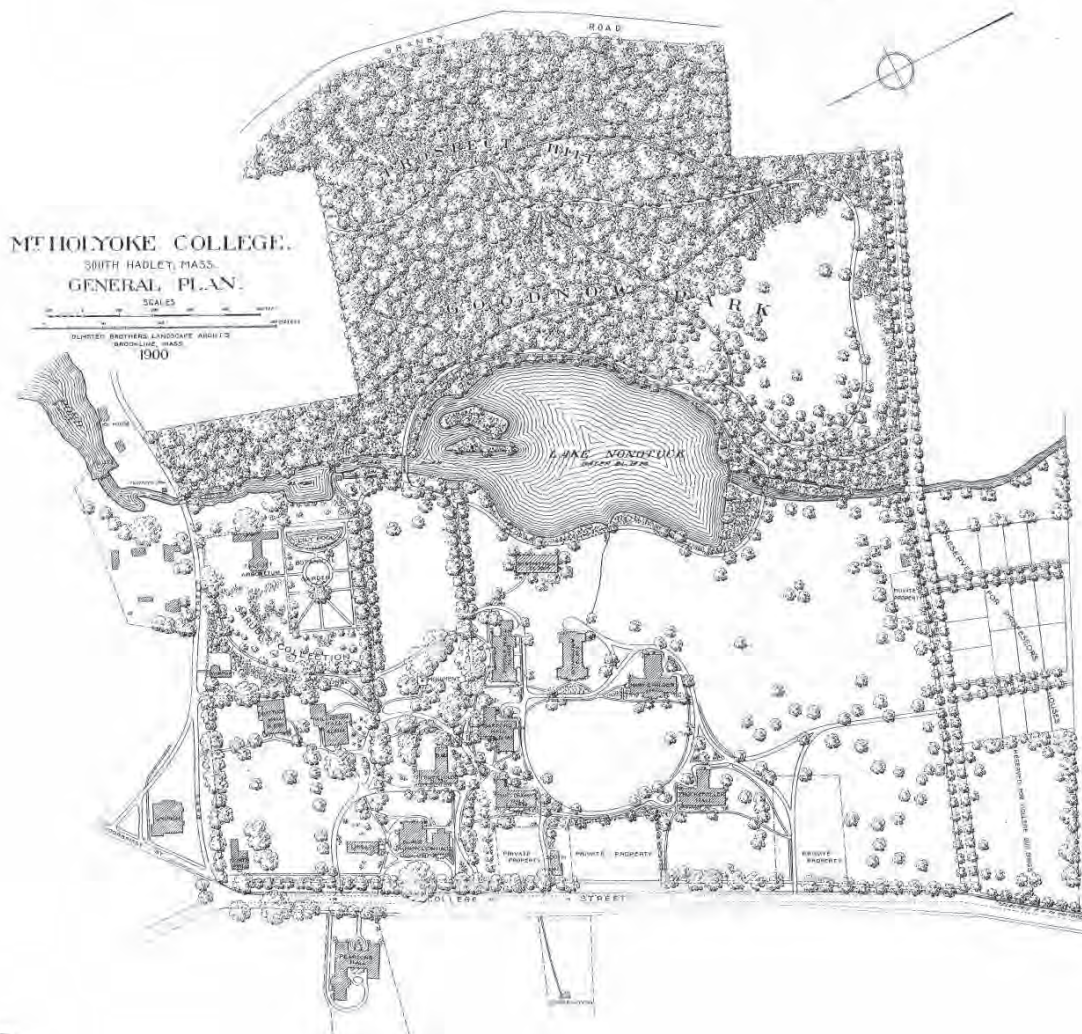


figure 10: Olmsted's general plan for Mount Holyoke's campus, 1900



figure 11: (top, left to right) Brigham, Safford, and Porter Hall, c. 1898; same view, 2019 (bottom)



Reconstruction Process



For years, architectural history has only been studied through photographs, drawings, and objects which capture a static snapshot of the past. Structural reconstructions were limited to two-dimensional media like drawings, watercolors, and photo montages. Physical models, although a more dynamic medium, prevents viewer immersion into the site. The advent of digital modelling software makes three-dimensional reconstructions of historic structures more accessible. By digitally reconstructing buildings which no longer exist, we are able to enter these spaces as if they were still standing today. This experience asserts the physical reality of the structures and their locations on campus. At a pioneering institution like Mount Holyoke where ritual and tradition are at the forefront of the campus identity, presenting the college's past in a palpable format encourages viewers to consider the presence of the original structures as they navigate the current space. Witnessing the proximity of the Seminary building to the main road in the reconstruction cannot help but draw connections to the fact that it occupies the space which is now Williston Library, Abbey Chapel, and Mary Lyon Hall, causing viewers to consider these buildings and their histories in a new light.

Digital modelling provides a secondary advantage to physical reconstruction in that the structure is editable and can constantly change and improve as new information about the original building emerges. This in itself raises some challenges, as modeling software can become outdated or die off completely as companies fail. Models require periodic upkeep and improvements as new historic documentation is discovered and technology advances. Not only must the model remain up to date, it must be continually presented in a widely accessible format based on the public's evolving access to technology. Accessibility problems include the fact that "some simulation software is proprietary; online delivery requires high bandwidth, stable browsers, and strong graphics cards on the viewers' machines, and legal rights to imagery must be explored".¹⁰ Preserving accessibility to the models of Mount Holyoke's early campus is vital in its use as a tool to study early visitors' experiences.

10 Diane Favro, "Se Non E Vero, E Ben Trovato (If Not True, It Is Well Conceived): Digital Immersive Reconstructions of Historical Environments," 274.

Williston Hall

My reconstruction process began with Williston Hall, prior to its 1889 addition, due to the abundance of informative primary source documents. Building plans, photographs, and drawings of the structure supplied by Mount Holyoke's Archives and Special Collections can be viewed in Appendix A. The differing viewpoints offered by such documents were then pieced together to create a three dimensional model using Rhino software. Using Rhino allows for the creation of curvilinear shapes and complex geometries which help to recreate the intricate details of Williston's facade. I began the model by outlining a two dimensional layout of the walls and doors based on their location in the floor plans drawn by Peabody and Stearns.

The base surfaces of the walls were extruded upward to create a three-dimensional room. While exact dimensions for the length and width of the buildings were recorded on the plans, the height of the walls, windows, and doors had to be estimated based on their relation to the measurements provided. As seen in figure 12 below, the width of Williston's second story room, which is described as 24 feet in the plan, acts as a scale for my approximation of the height of the first floor (shown in red). This assessment compromised due to the fact that the marked width of the interior room differs from the exterior view when wall thickness is considered. At roughly a foot and a half thick, it is unclear from the plans whether the marked dimensions include this thickness or are the dimensions the free spans of the room. The ambiguity of the plans therefore impacts the reliability of the vertical assessment. Additionally, the use of a photograph for scale creates distortion of the image due to the angle at which it is taken. Thus the exact scale of the building must be understood as conjecture.

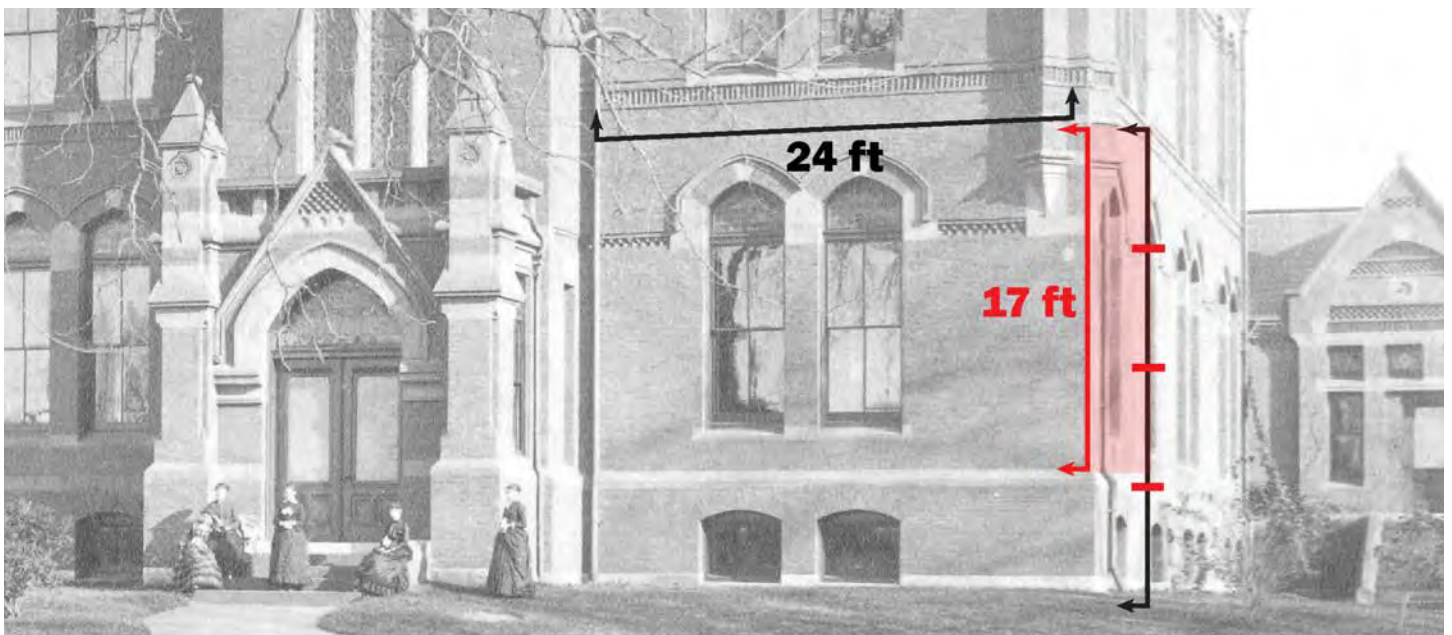


figure 12: Williston Hall approximation of dimensions

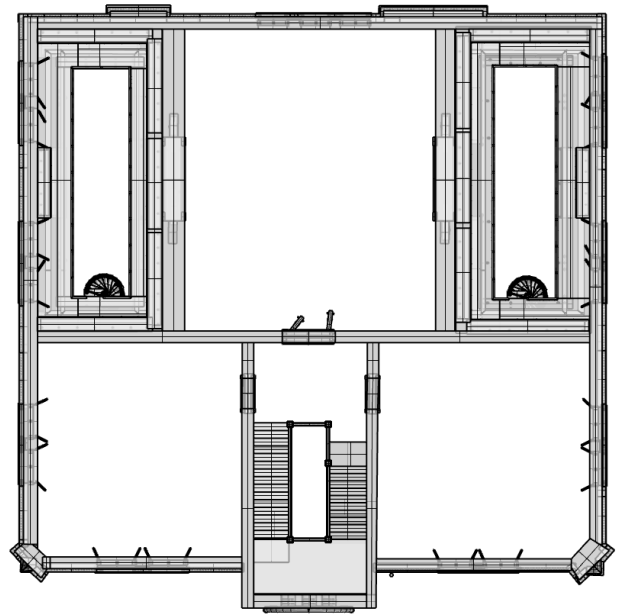
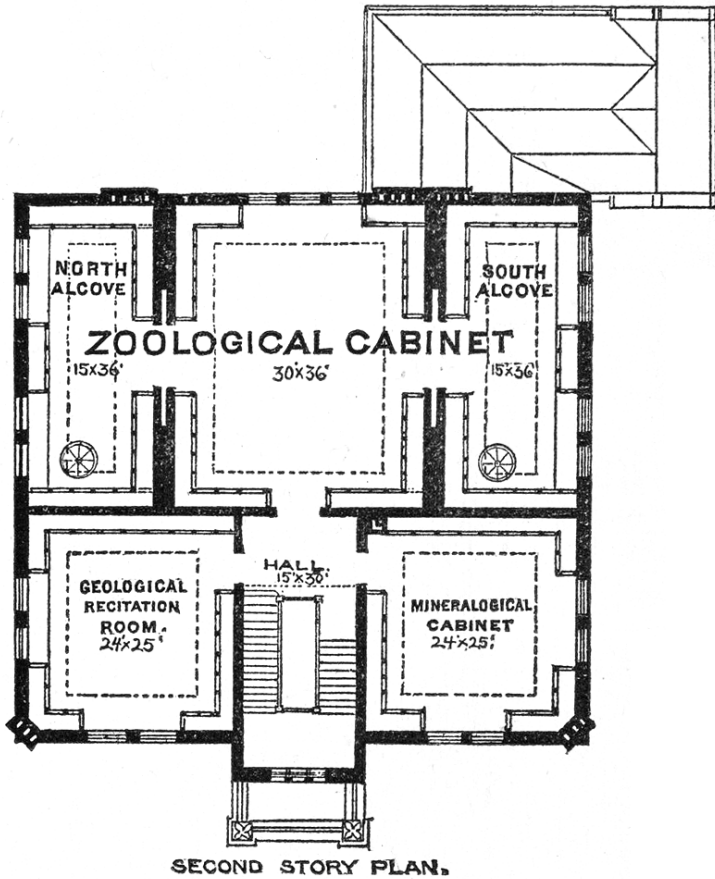
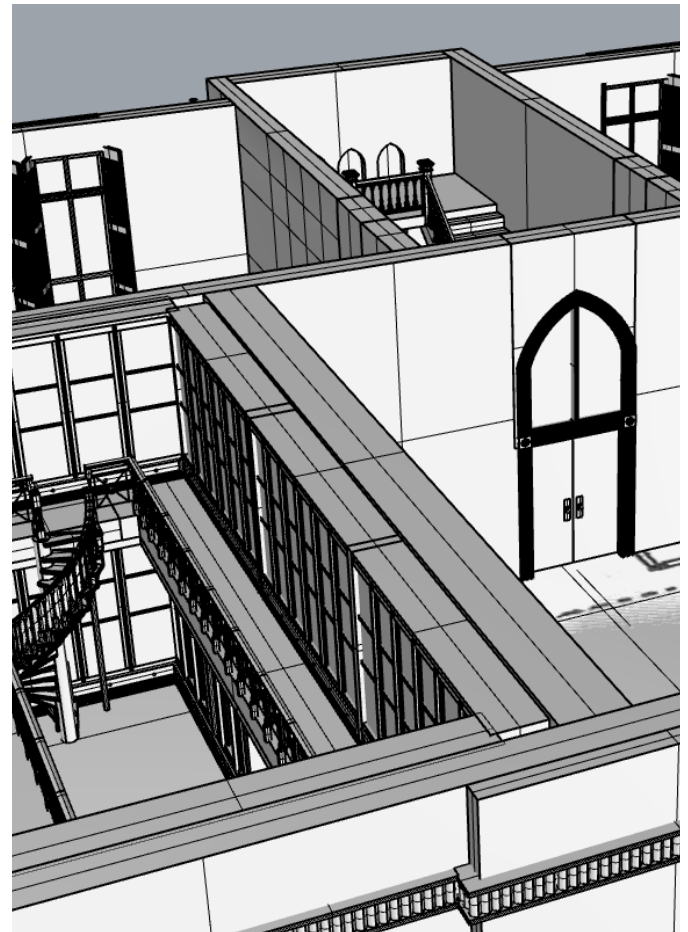
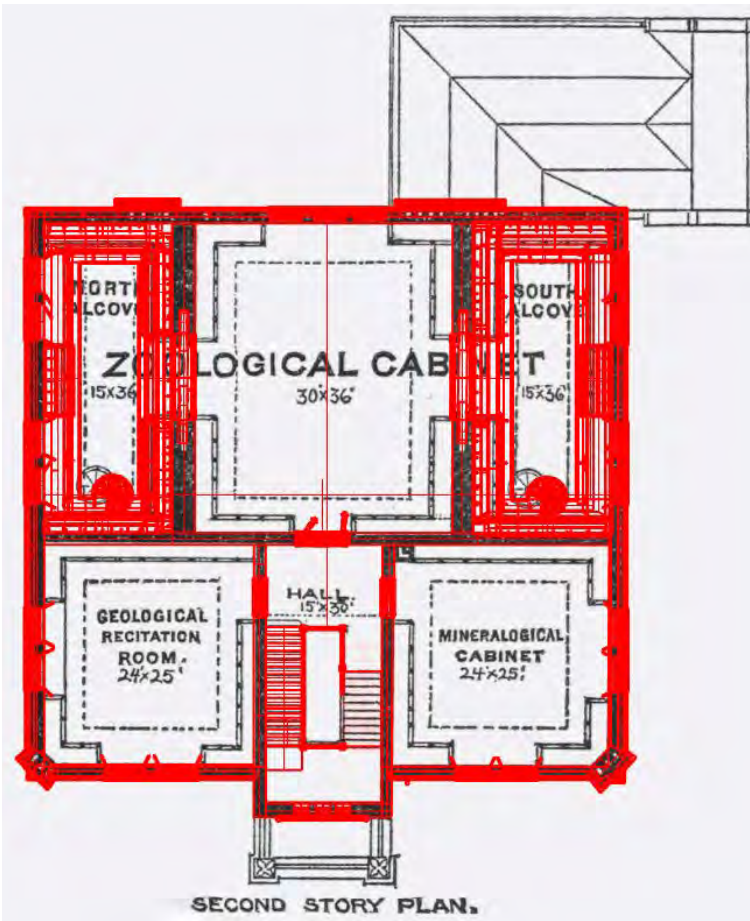
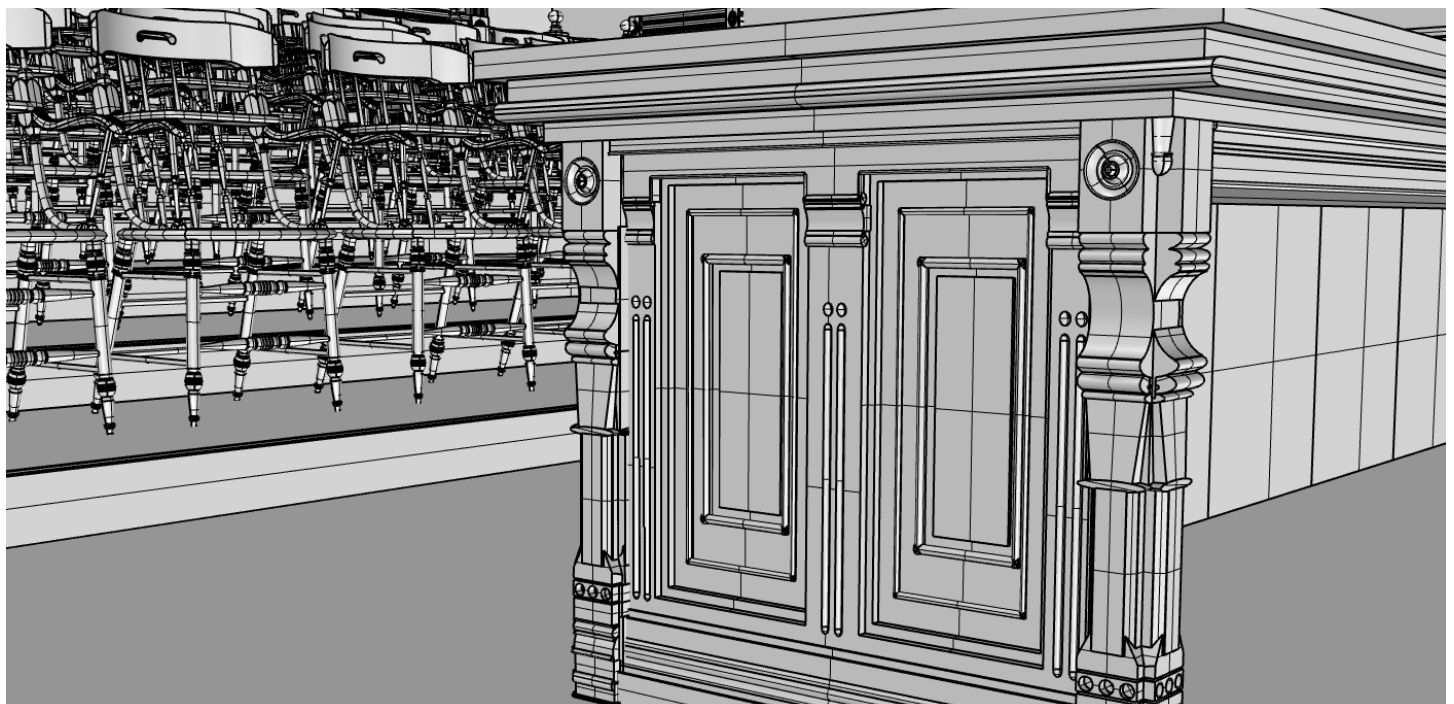
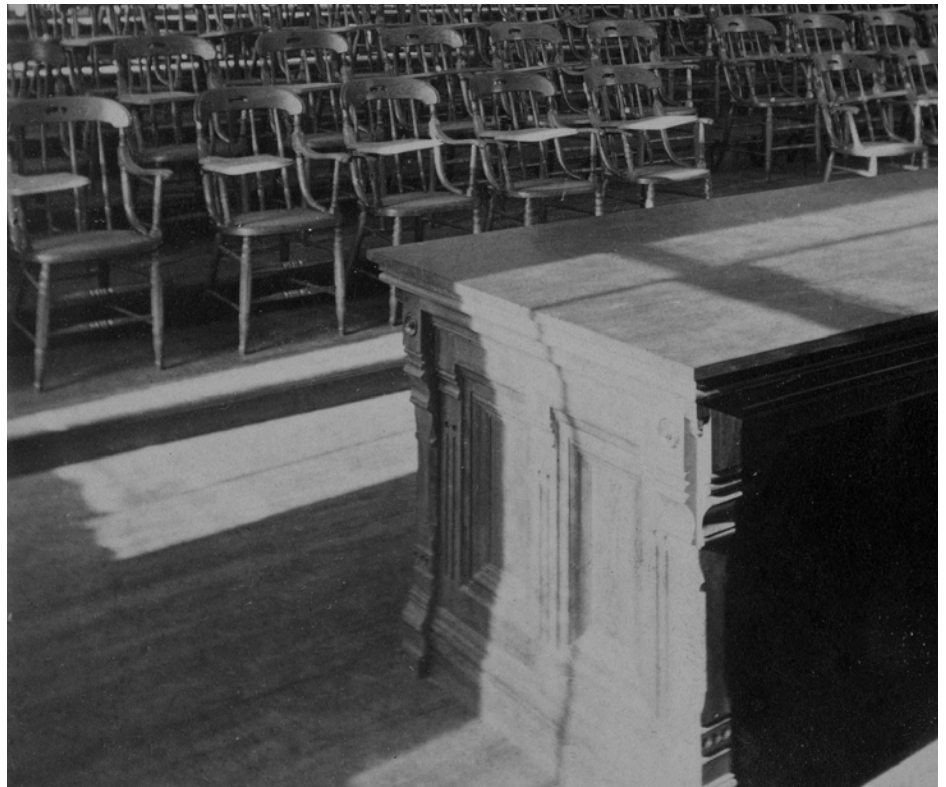
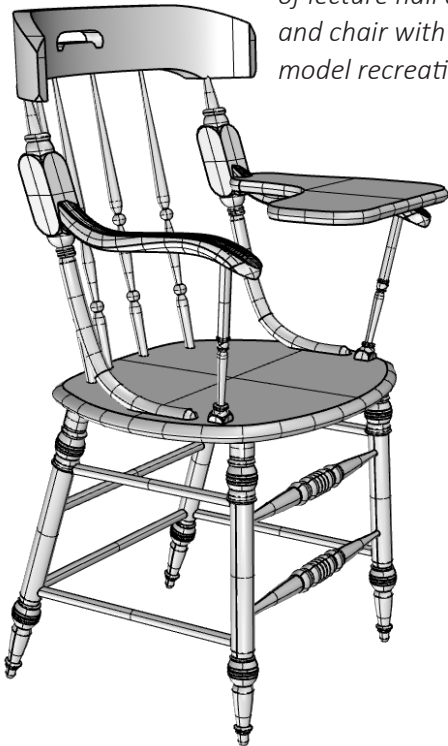


figure 13: (left to right) Williston Hall second story plan; top view of model; overlay of plan and model (in red); perspective view of model



After creating the main structure of the building, photographs of interior rooms allowed for some level of detail to be added. Although similar to what is presented by the photos, these details are approximations, distorted by the low quality of the old photographs and the limited angles from which to gather information. For instance, the long wooden desk in Williston Hall's main lecture room only has a clear photograph of its short edge, leaving me to assume that the other sides had a similar detailing. Chairs present in the room can only be seen from one angle and from a great distance, making accurate recreation impossible.

figure 14: close up of lecture hall desk and chair with model recreation



The spiral staircases and balconies of the second-floor alcoves required a similar approximation. No documentation exists for the exact height of the balcony or rise and run of the steps. Based on typical step rise of seven inches and run of eleven inches, and the number of steps shown in the photo, I approximated the height of the balcony at nine and a half feet. As shown in figure 15, the dimensions appear slightly off in the model, though again, both are influenced by the angle at which the image was taken.

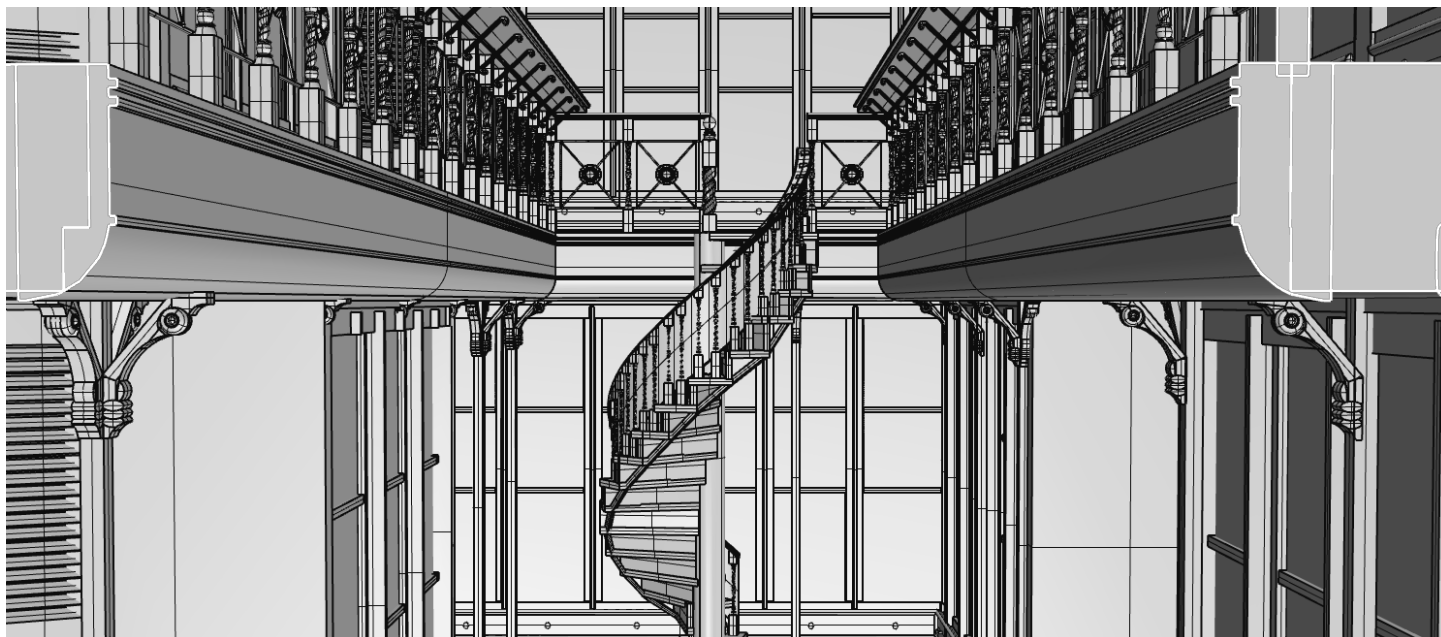


figure 15: comparison of Williston Hall second floor south alcove model (top) with photograph (bottom)

The front facade features an intricate level of detail which cannot be fully viewed in any of the photographs, all of which were taken at eye level.

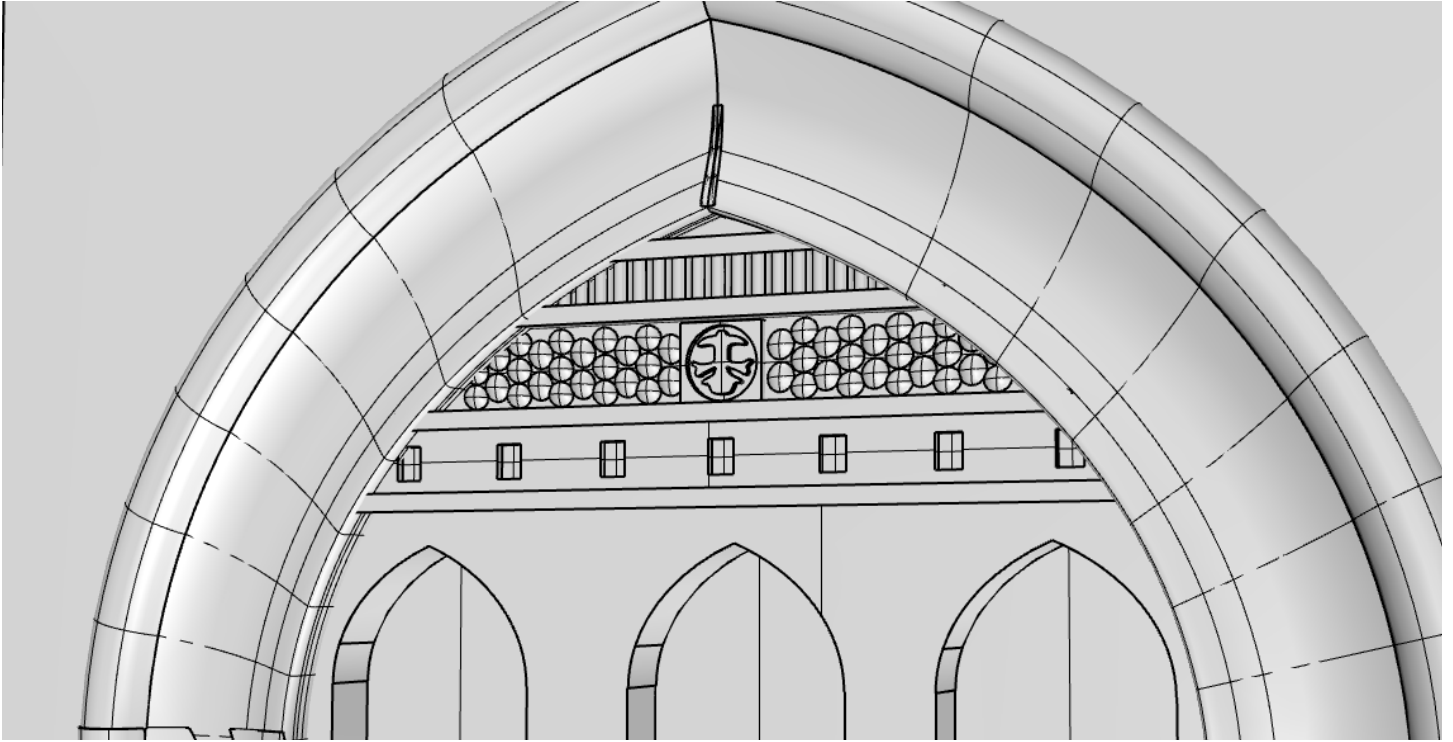


figure 16: Williston Hall exterior facade model (top); photograph of Williston exterior c. 1890 (bottom)

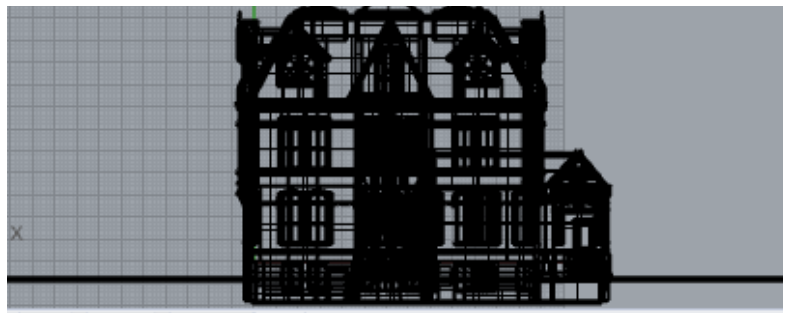
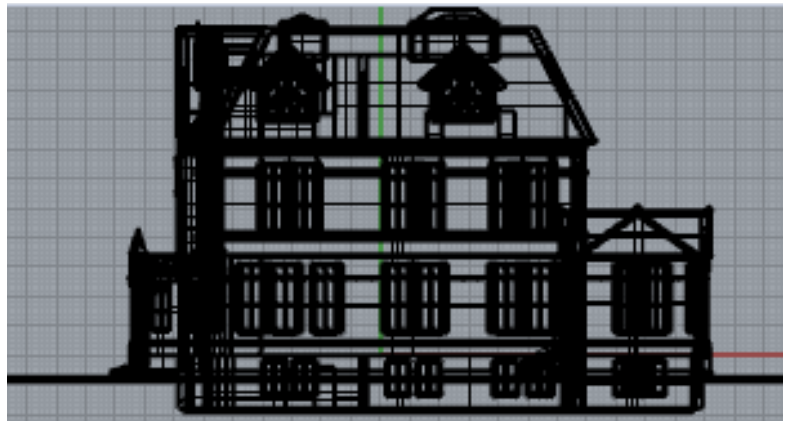
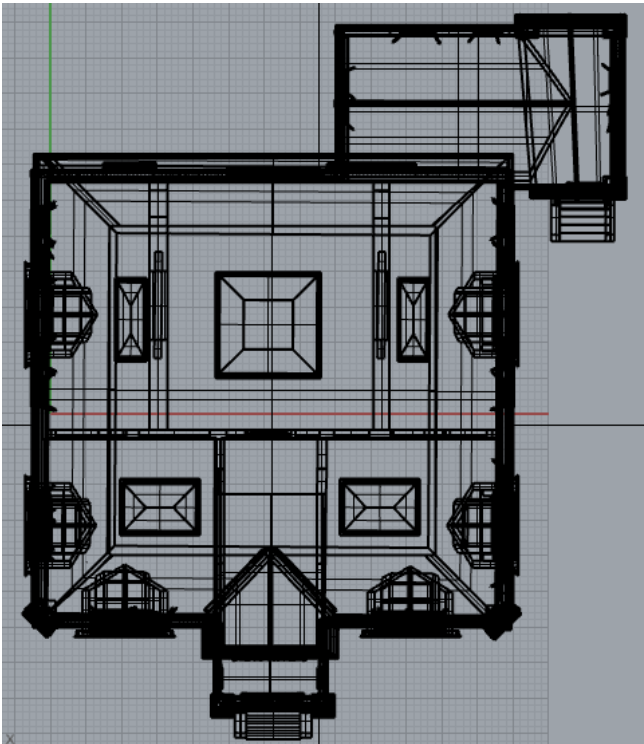


figure 17: perspective, top, and elevation views of Williston Hall Rhino model

Seminary Building

Reconstructing Williston Hall and the Seminary building required slightly different approaches due to the type of information available for the individual buildings. Intricate plans of each floor of Williston Hall allowed for a greater level of interior detail than was possible in the Seminary building model, which had less documentation. The plans for Williston Hall were drawn to scale, and included wall thickness and structural elements. Such detailed architectural plans were either not recorded for the Seminary building, or were drawn after its construction in 1837. Instead, all that exists to document the interior of the building are drawings done from memory by a former student, Lucy Goodale, in 1839 (figure 4). My model recreates the final version of the structure, following its 1888 library addition.



figure 18: Seminary Building model (top); exterior photograph of Seminary Building, c. 1890 (bottom)

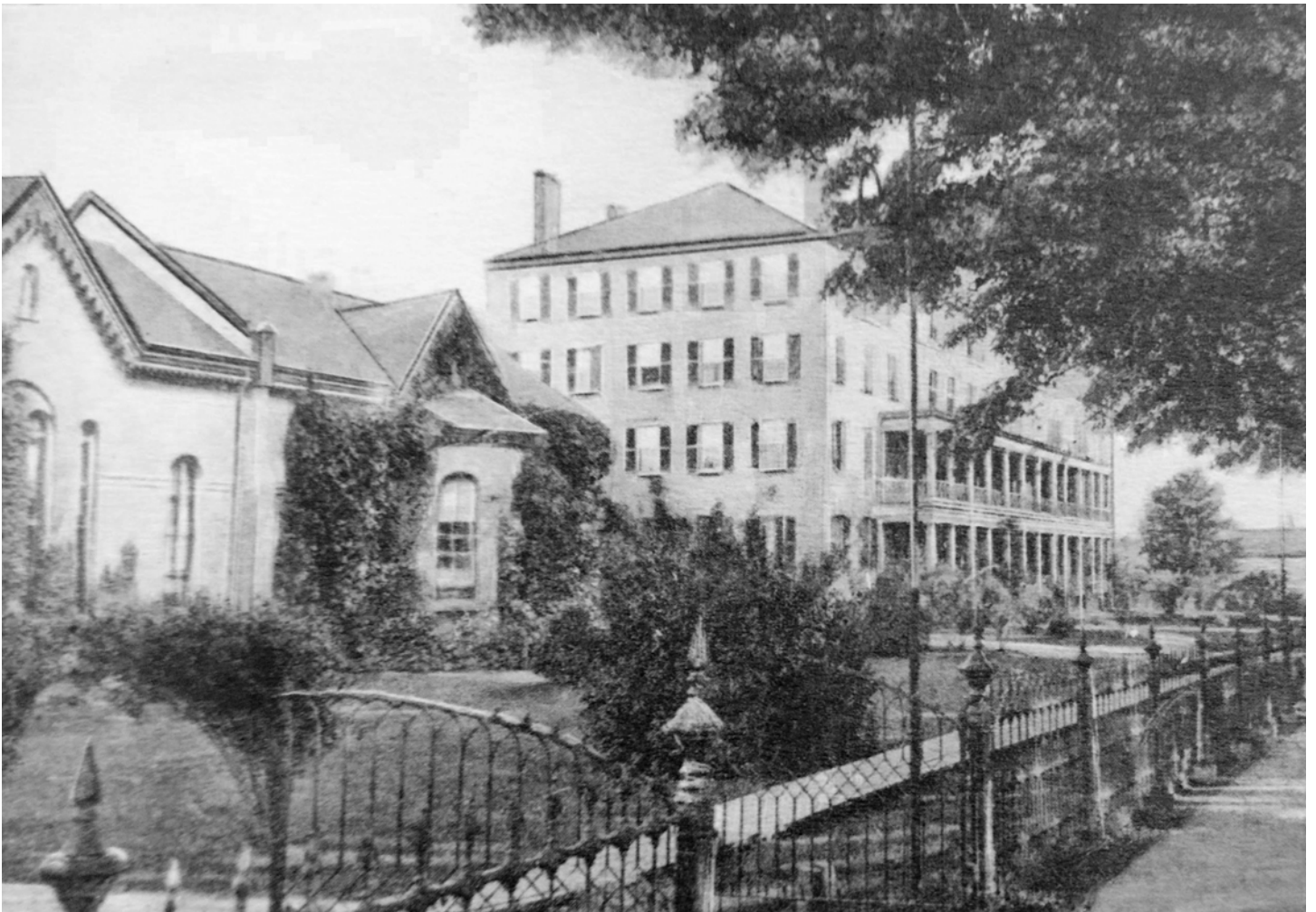
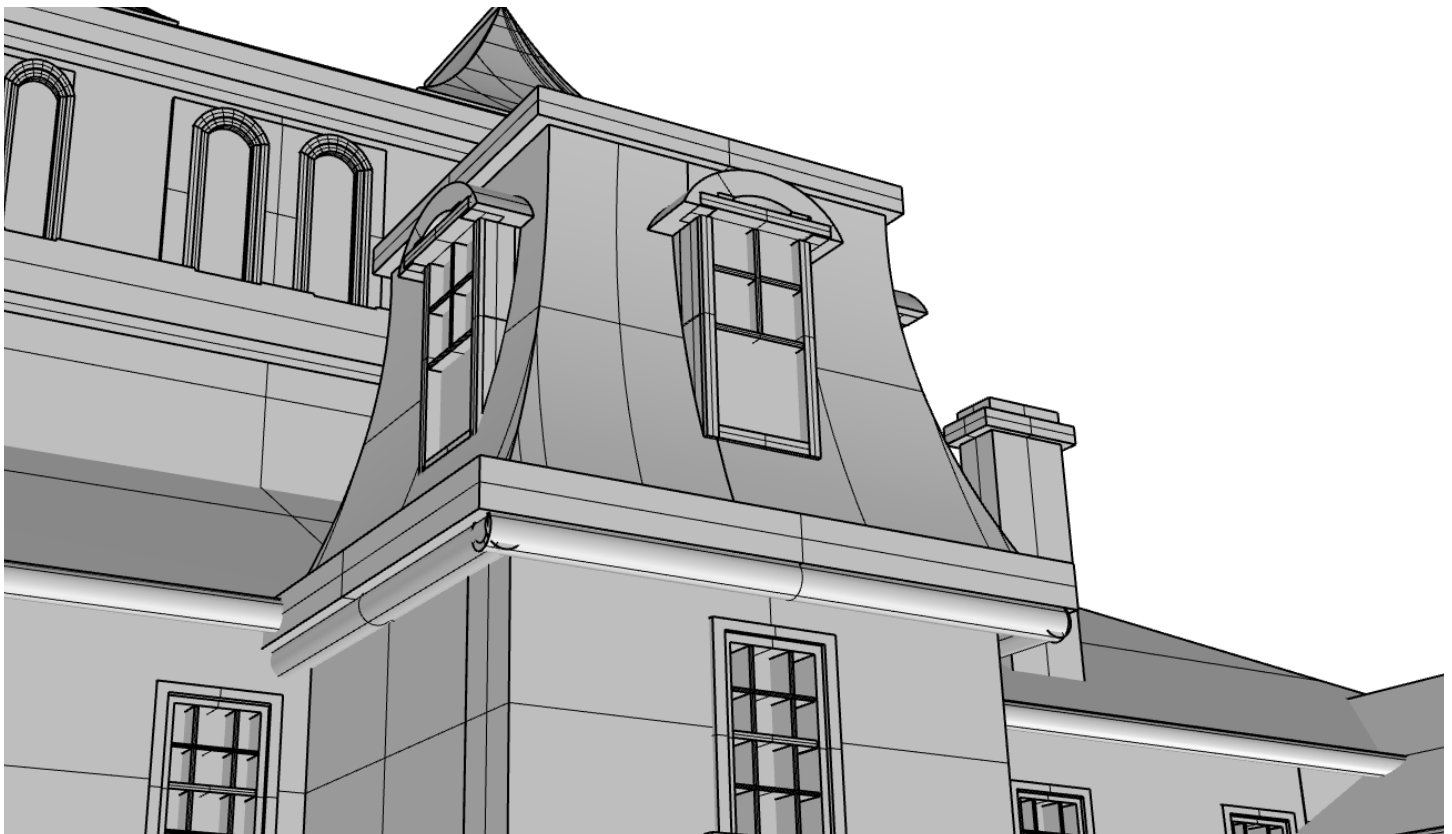


figure 19: Seminary Building model (top); exterior view of Seminary library and central building, c. 1890 (bottom)

Despite lack of interior documentation, the exterior required a similar photo analysis as that of Williston Hall in order to approximate detailed elements. The comparison below shows the bathroom tower, built in 1880, which brought water into the building from a 450 foot deep well. Once again, there is significant perspectival distortion in the low-quality photograph due to the angle at which it was taken.



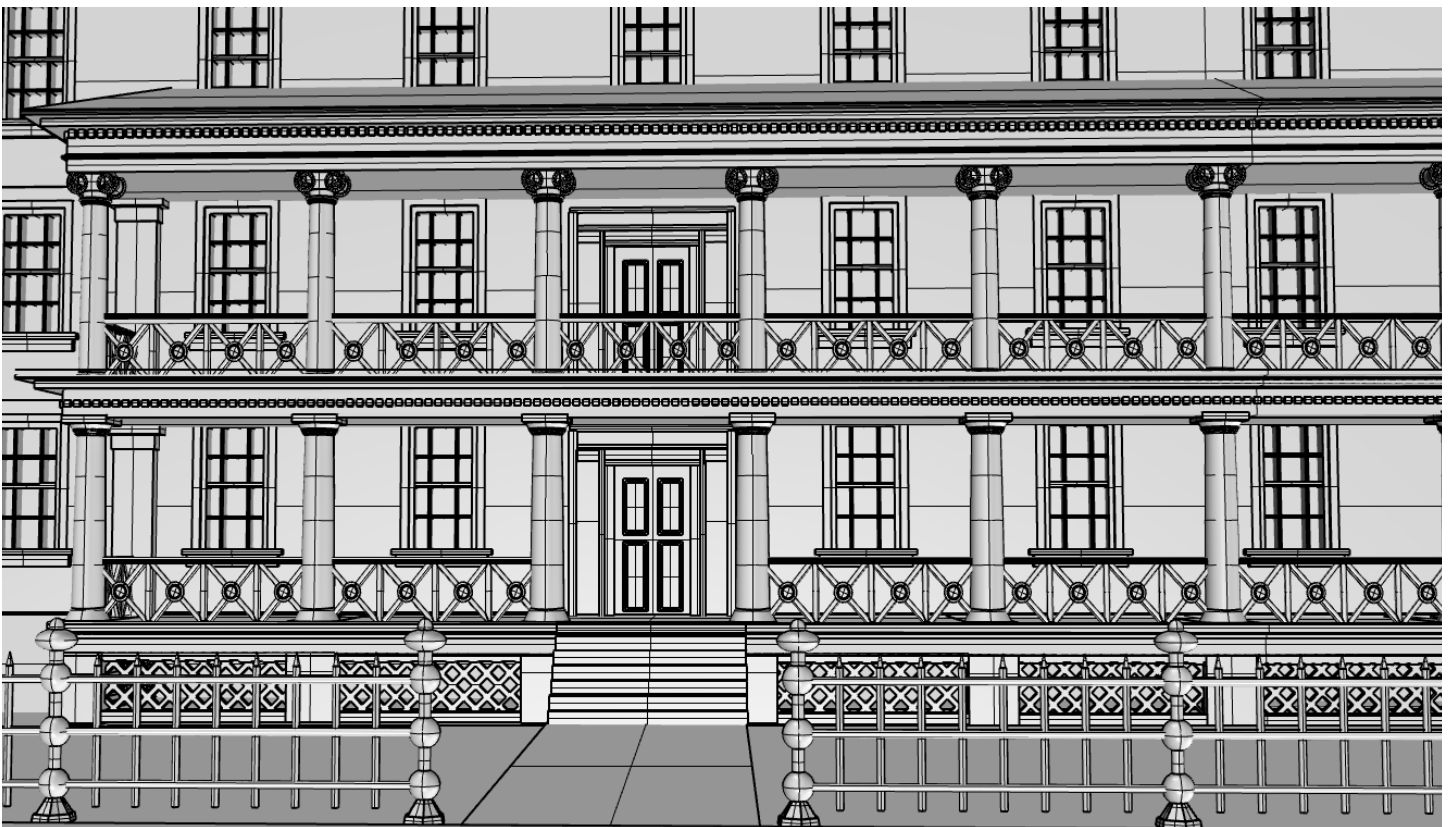
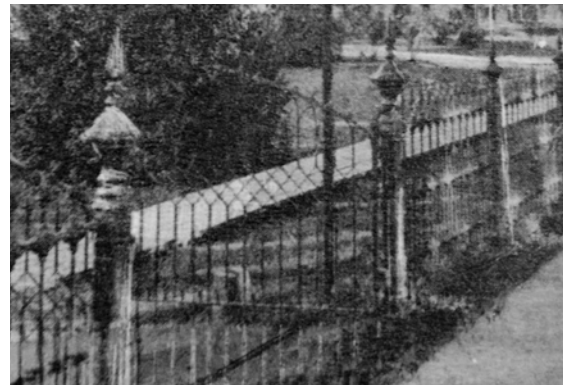
*figure 20: Seminary Building
bathroom tower (right); bathroom
tower model (below)*



The details of the Seminary building's columned front porch are shown in a group photograph of the class of 1877. It is clear in the photograph that the porch follows the proper structure of Roman and Renaissance columns, with Doric on the lower level and Ionic above. Even still, exact dimensions and features of the decorative elements are impossible to replicate due to the distance of the photograph. Similarly, the iron fence added in 1876 which shields the structure from the main road can be seen in an exterior photograph, allowing for its approximate recreation. A nearly identical iron fence lines the campus today. While its presence takes some of the guesswork out of some aspects such as the spacing and height of the posts, it still does not indicate a perfect recreation, as the fence may have been altered over the years.



*figure 21: Seminary class of 1877 (left);
close-up of iron fence (top right);
model of Seminary (below)*



Creation of Video



Although the terrain in the rendering is inaccurate, other aspects of the landscape, such as sun position, can be more precisely controlled. Since the Seminary Building was built along the road which is now MA-116, the exact cardinal direction can be replicated in the model. Information about solar features of South Hadley in the 1800s can be gathered and used with the model to study lighting conditions.

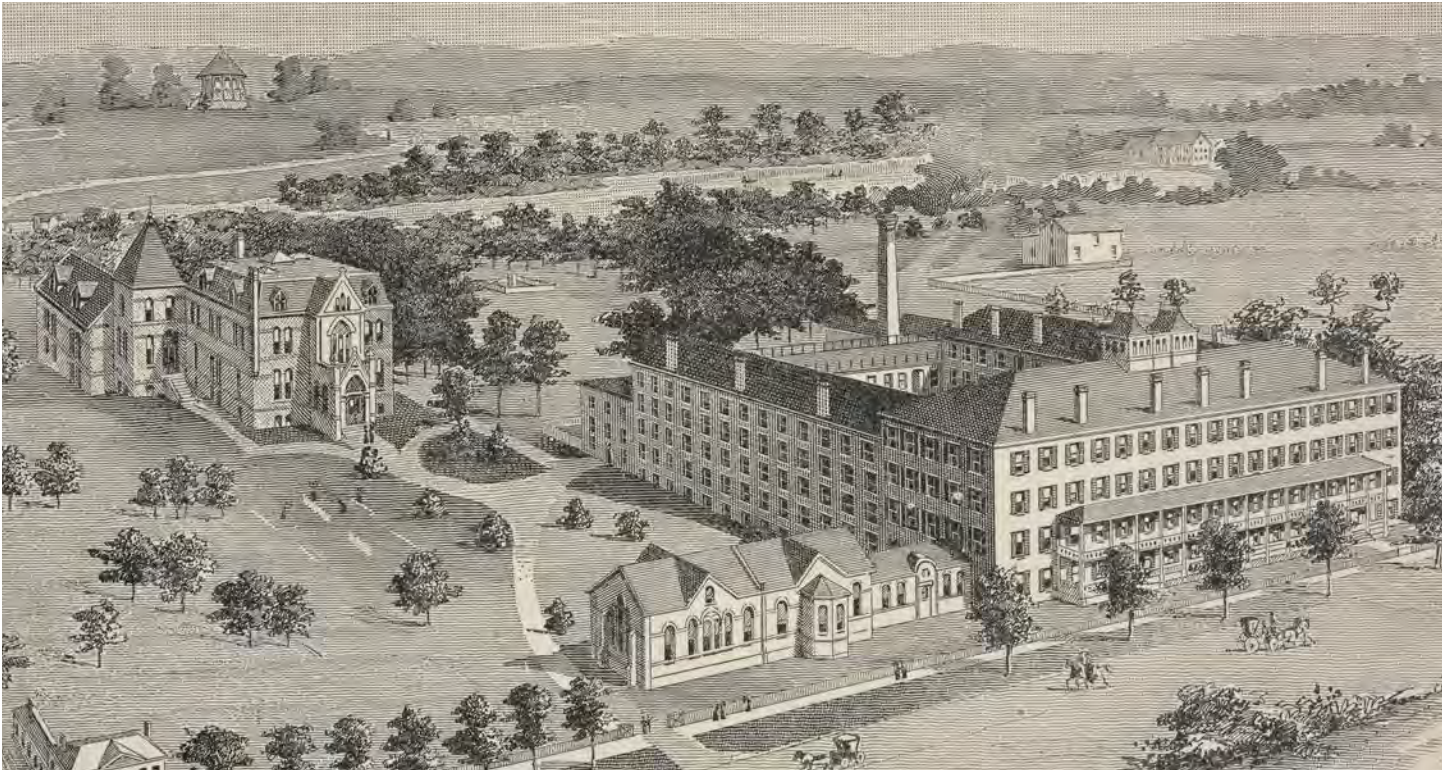


figure 23: Comparison of bird's eye drawing, c. 1890 (top) with rendered model of early morning scene (bottom)

While photographic evidence of the buildings gives some indication as to material properties, their exact colorization and texture requires numerous decisions to be made by the model's creator when brought out of its grayscale form. It is clear in photographs that the exterior of Williston Hall is made from brick, but the exact type and shade of brick is impossible to tell. Choosing to use a specific type of brick over hundreds of options influences the way the rendering, and by extension, the buildings, are perceived.

Further complicating this issue is the question of what state to present the buildings. In my rendering, both Williston Hall and the Seminary building are presented as pristine, new structures, which contradicts what is known about the construction dates of individual components of the buildings, as they span nearly forty years. Details such as weathering, graffiti, and damage are not seen in the model. The danger of presenting the buildings at their initial, unmarred conception is that, "this emphasis has had the unfortunate side-effect of marginalizing buildings and relegating them to the status of a product, rather than a process".¹² The immaculate state of all components of the buildings disregard their many renovations throughout the years. In a project that is intended to reveal the shifts in the campus' architectural style, the unnaturally pure appearance of the models serves to detract from this understanding.

Despite my efforts to envision the daily path of a Mount Holyoke student in the late 1800-'s, my model includes no evidence that people existed in the space. No initials are etched into the underside of wooden desks, no belongings are present in rooms, no local townspeople are seen wandering campus. The model presents itself very clearly as an idealized realization of the space as it never would have actually existed. While this detracts from the believability of the space, it is beneficial in reminding viewers that they are viewing an imagined recreation in which many elements of the site have been omitted or unnaturally preserved in a way only a digitally fabricated rendering can.

12 Nicola Camerlenghi. *St Paul's Outside the Walls: A Roman Basilica, from Antiquity to the Modern Era*. (Cambridge, United Kingdom: Cambridge University Press, 2018), 19.

In considering the most accessible and descriptive method of making my reconstruction available to a larger audience, I chose to document it in the form of a video exploration of the site. The video is able to incorporate some degree of dynamism into the scene and make the environment more naturalistic by adding features such as flying birds or the rustle of nearby trees. In response to the many assumptions and inaccuracies within the model and its environment, I incorporated photographs of the actual site as each location was approached in the video. By providing the viewer with the same primary source documents upon which I based my model, they are able to analyze the information and discrepancies for themselves. This removal from the immersion of the video allows viewers to come to their own conclusions about the structure. Viewers get a sense that, in the video's creation, I was, "assuming the role of choreographer, to ensure that the representation and related materials are seen in a desired sequence or from a particular viewing spot".¹³ Nevertheless, the decisions made about which photographs to include in the video and which to omit adds another level of complexity by withholding some information from the viewer, influencing their understanding of the space.

As the video pans throughout the campus, it attempts to replicate the path of a visitor by moving at a speed and height which approximates the average 5' 5" person's eye level. However, the scene opens from a bird's eye view of the whole campus and flies unnaturally past the structures, introducing the idea that not all elements are meant to be regarded as realistic. Similarly disconnected from the realistic experience of walking through a space, the video lacks the quality of free will. Actual students or visitors to the campus at the time would have taken infinitely different paths, views, heights, and speeds on their walk through the site. While the video's visual exploration engages only the viewer's sight, other senses such as smell, touch, and hearing would have been active when exploring the space in real life. Thus, the video is not a replication of the site so much as my own modern interpretation of the structures. When viewing the video reconstruction, one gets an idea of being on campus prior to the fires yet must recognize that some distance from the exact experience will always exist.

13 Favro, *Se Non E Vero*, 274.



figure 24: Comparison of rendered model (top) with photograph of Williston Hall Geology Cabinet (bottom)



figure 25: Comparison of rendered model (top) with photograph of Williston Hall Lecture Room (left)



figure 26: Comparison of rendered model (top) with photograph of Williston Hall Art Gallery (bottom)

Challenges



Despite attempting to accurately recreate the historical setting of Mount Holyoke's campus prior to the fires, a number of assumptions were made in order to create the digital model. Not only do the model and accompanying video fail to capture the experience of a visitor at the time as a consequence of the lack of free will, they also do not necessarily reflect the true structure of the buildings. The models must be understood as approximations of the structure to assist viewers in understanding a sense of how the buildings may have appeared on the site. They are not reproductions of the buildings themselves. Similar to Nicola Camerlenghi's goal in digitally reconstructing St. Paul's Basilica, "my decision to write about a building that is no longer extant and that cannot be studied in person was made with the awareness that carefully crafted digital models could help make sense of such a lost space and could help us understand what was where, and when."¹⁴ The intention to use the model as a means of furthering historical analysis depends predominantly on explicitly detailing each assumption and inaccuracy with which the model was made.

Obstacles identified by Camerlenghi in St. Paul's reconstruction, such as discrepancies among sources and incomplete information, posed similar problems in my own process. While the photographs and plans gathered from Mount Holyoke's archives create a detailed dossier of the Seminary building and Williston Hall, there are still elements of the structures for which there exists contradicting reports or no documentation. In these cases, the decision to either leave the area empty or to construct what I believe may have existed there compromises the overall accuracy and authenticity of the model.

14 Camerlenghi, *St Paul's*, 269.

One example of this is found in the interior of the Seminary building. Plans of the structure fail to detail exactly how the interior spaces were divided, beyond the hand drawn images in figures 3 and 4. No such drawings exist for the building's extension, as seen in figure 5. Written documents, photographs, and hand drawn plans of student rooms, elaborate on some details of the interior, yet not enough information can be found to compose an accurate model. Although this information is enough to generate an imagined interior loosely based on the average room's dimensions, many unanswerable questions remain, such as the thickness of the walls, the placement of closets, and the width of the hallways, etc. For this reason, I chose to leave my model of the Seminary empty inside, rather than invent my own version of what may have existed. As a consequence, the video is unable to explore the interior of the building which would have served as the focal point for student life and study on campus.

In other cases, multiple sources exist with conflicting information. This poses a problem when selecting the source upon which to base the construction of the model. Williston Hall has two sets of documented floor plans which are nearly identical to one another. However, as figure 27 reveals, small differences can lead to debate over the actual state of the structure. The plans of Williston's second floor show spiral staircases in two significantly different locations, neither of which is the true location of the staircases shown in photographic evidence. This discrepancy could be explained if the plans are seen as preliminary ideas, refined until they resulted in the version shown in photographs. Alternatively, the plans may show what Williston looked like prior to renovations, for which updated plans do not exist. In either case, this inconsistency causes the plans to lose some credibility when attempting to visualize the built structure. What else may have been built differently than the plans indicate but may not have photographic evidence to contradict them? In this instance I elected to follow the information presented by the photographs rather than the plans, but other elements that rely solely on the plans are potentially inaccurate in the model.

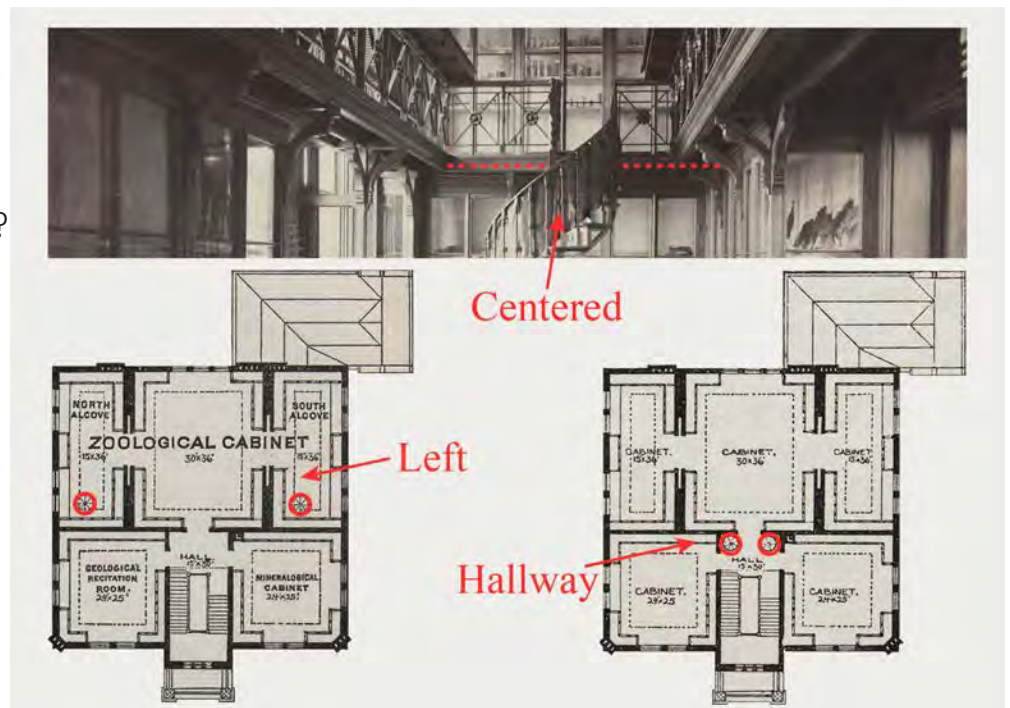


figure 27: Williston Hall plans compared to photograph of second floor south alcove

Plans of Williston's second floor expose another problem: the dashed line which surrounds each room. According to the photograph of the south alcove, this dashed line could indicate the presence of a small balcony running around the room. However, photographs of the main zoological cabinet room reveal that no such balcony existed there, despite the dash line encircling the room on the plans. Therefore, the dashed line may indicate an initial intention to include a balcony in every room of the second floor, which did not come to fruition in the final construction. It could also reference a change of height of the center of the ceiling in each room, a feature which cannot be seen in any of the photographs.



figure 28: Williston Hall second floor Zoological Cabinet

Another uncertainty found when analyzing the plans is seen in the overall length of the Seminary extension. While the plan includes clearly marked dimensions for each portion of the structure, bringing the building into digital modeling software exposes inconsistencies with the drawing. Building the original structure to a width of 94 feet, the indicated length of the building at 200 feet does not fit with its representation. Shown in figure 29 below, the model extends far beyond its location in the plan. In this case, one aspect of the plan is wrong- either the drawing or the marked dimension. My model adopted the marked dimension after analyzing photos which appeared to show the building extending further back than the plan would indicate. Nevertheless, this again relies on the perspective at which the photograph was taken and therefore cannot be seen as entirely accurate.

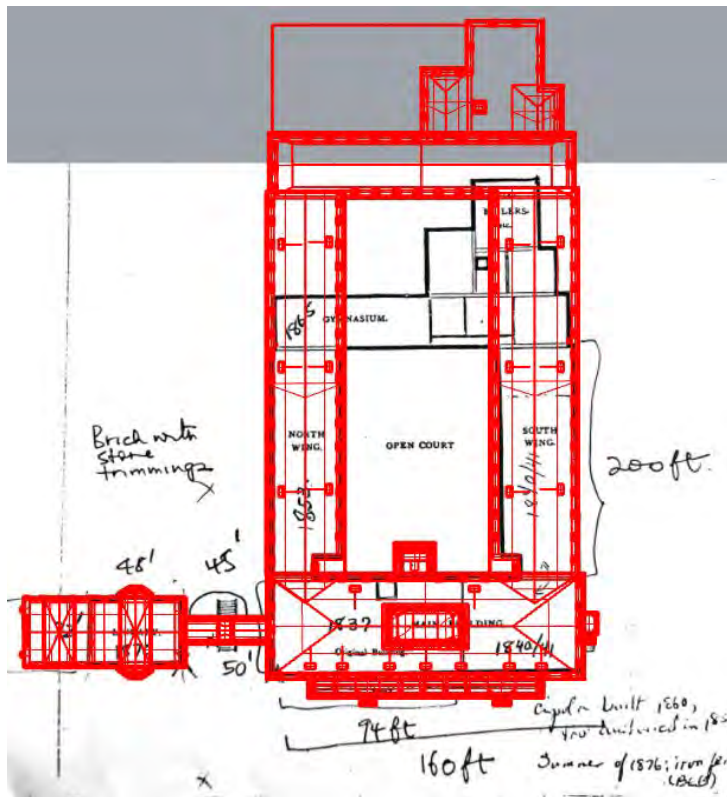


figure 29: Seminary plan with top view of model overlay in red

The color of the materials introduces further complications. The decision to add color to my video reconstruction determines that the model is undoubtedly slightly inaccurate. Whichever colors I chose to represent the various materials throughout the building are based primarily on assumption. Rendering the model with different material representation changes the viewers' perception of the structure. In figure 30, I compare two different colorization options for the exterior of Williston Hall with a completely neutral greyscale version of the model. There is no way to know for certain which version is closest to the actual building, as no color photos exist to consult. One option for making an accurate approximation would be to consult the bricks used at College Hall, built around the same time and by the same firm as Williston Hall. Yet it is unknown whether the two structures used bricks from the same supplier or with the same specifications. Additionally, the modern bricks seen in photographs like figure 31 have withstood nearly 150 years of weathering since their initial construction, which has undoubtedly changed the color.

The creation of a colorful visualization can cause viewers to link the model with the actual structure in their minds, making it easy to forget that this may not have been precisely how the structures appeared. Overwriting history in this way is one of the biggest challenges when working to preserve or revive lost objects through a modern format. Making decisions about how to deal with gaps in information about the buildings affirms the validity of the model. Regardless of the disclaimer that not all of the model is exactly accurate, its visual form makes it appear realistic and authentic. Since assumptions and discrepancies are inevitable, the best way to resolve this issue is to regard the model as its own entity. Although the video is a representation of Williston Hall and the Seminary Building, it is not Mount Holyoke's early campus- instead it offers a reimagination of how I understand its appearance.

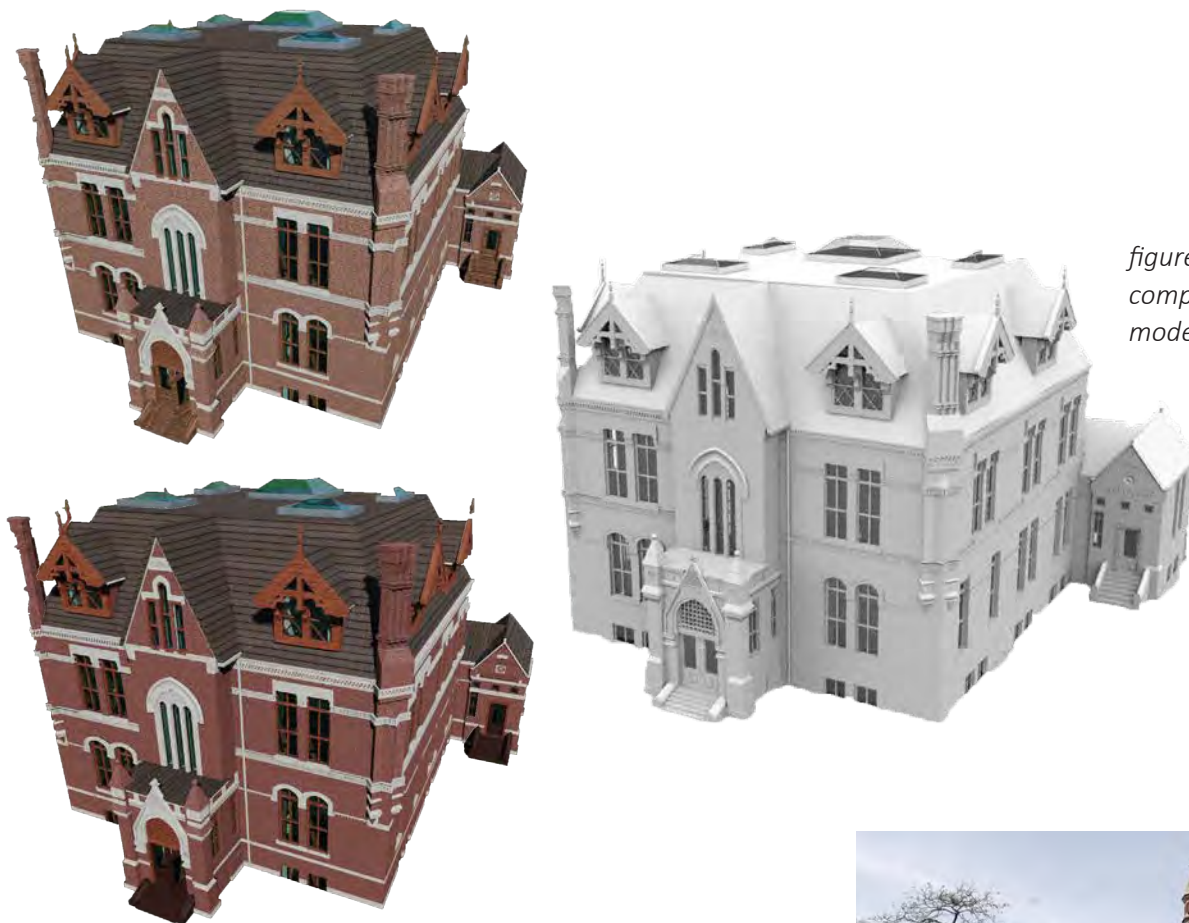


figure 30: Colorization comparisons of Williston models



figure 31: College Hall, Smith College, 2019

Future of the Project



Studying history through modern technology means that, as the past remains the same, our ability to study it is constantly evolving and improving. While the 3D model and exploratory video allow modern viewers to envision the lost Mount Holyoke campus in a new and engaging way, more could be done to improve both the accuracy and interactivity of this experience. The many challenges of digital reconstruction which I have discussed can be reduced as technology is improved. However, the challenges will never be entirely resolved because there will always be unknown aspects of the former buildings for which answers do not exist.

The video I created allows two dimensional photographs to be experienced three dimensionally, yet the absence of choice available to the user robs the video of a degree of naturalism. Other formats, such as those used in video games, allow for more freedom and interactivity which would enhance the experience. If the model were presented in an open world experience, a viewer could choose which path to take throughout the site as they would in real life. Objects could be individually inspected and manipulated in the same way one could have picked them up in real life. Interactivity forces the model further into the realm of invention, requiring an excess of other assumptions to be made about undocumented spaces and objects found throughout the building.

On the other hand, a video game format has its own benefits in the ability to make supplementary information about the structure more available to viewers. Where the video could only provide viewers with a selection of primary source photos, pop-ups can be added to a video game which offer access to all photographic evidence, as well as historical analysis of individual characteristics. These pop-ups can be viewed at will and from an angle not predetermined by the model creator's choreography, deepening the viewers' own personal understanding of the holistic information provided by the model.

While a video game format would enhance the experience, it does not allow for full viewer immersion into the space. Virtual reality (VR) technology allows the viewer to envision themselves entirely within the site, uninhibited by the bounds of a screen. VR mimics qualities of the human experience, allowing users to "exercise their built-in capacity for understanding stereopsis and motion parallax".¹⁵ Our eyes process visual stimuli in 2D, yet are able to perceive the three-dimensionality of the environment through inherent depth cues. This sense of presence, coupled with the ability of VR to create auditory and haptic elements, activates more of the users' senses than would be engaged by simply viewing a screen. In the case of Mount

15 Doug A. Bowman, and Ryan P. McMahan. "Virtual Reality: How Much Immersion Is Enough?" *Computer* 40, no. 7 (2007), 39.

Holyoke's reconstruction, the physical constraint felt when wearing traditional nineteenth-century clothing would need to accompany the simulated environment to enhance the historical believability of the experience.

VR makes it possible to analyze structures in more ways than just visually. Simulating navigation through the space can resolve questions of accessibility. For instance, "through the simulation of a virtual wheelchair, the accessibility of a design can be witnessed first hand. By rolling through the scene, using the integrated collision detection, possible problems can be checked".¹⁶ The Seminary Building and Williston Hall were both built long before the Americans with Disabilities Act (ADA) was created in 1990. Although no laws existed to ensure that they were built in order to accommodate wheelchairs, it is very possible that students or faculty with disabilities attended at the time. Reconstructing a model of the structure and simulating the experience of navigating the space with a wheelchair reveals the ways in which life for some visitors to campus may have been inhibited.

Interactive formats simultaneously achieve greater authenticity of experience while also posing further questions about the accuracy of the model. Where my video format ensures that certain questionable spaces cannot be seen, there would be no way to exclude viewers from these spaces without reaffirming the limitations of the model. Since we do not experience forces which prevent us from looking up at an incomplete ceiling, or walking through a doorway into an unrealized room, experiencing these limitations in the model will remove the viewer from their full immersion within the space. The imprint a viewer makes on the space if they move an object or sit on a piece of furniture also serves to change the space in a way it may not have been affected in the actual building.

Tele-immersion, in which multiple users receive audio and three-dimensional visuals of each other while within a simulated environment, offers an interactive digital space for users to collaborate, improve, and discuss the reconstruction. While this format has its benefits, it introduces a type of interaction which would not have existed in the real space. Multiple animated users mingling in a digitized space where movements such as walking into walls or standing immobile for long periods of time are perceived as normal would not have existed at the real site, therefore removing a level of realism from the immersion. Additionally, these avatars carry with them their own memories of modern society and the understanding that they are currently within a highly technological simulation. Due to the unique and relatively new

16 Stefan Boeykens. "Using 3D Design Software, BIM and Game Engines for Architectural Historical Reconstruction." (*CAAD Futures 2011 : Designing Together*, 2011), 501.

nature of VR itself, users find that, “seeing the stereoscopic graphics pop out of the screen, picking up a virtual object with their real hand, and realizing that head movements change their view of the virtual world all provide a unique experience”.¹⁷ Rather than replicate the experience of being a nineteenth-century New England woman spending her early twenties on the campus of Mount Holyoke, VR users are distinctly aware of their twenty-first century position, prohibiting any chance for complete historical immersion.

17 Bowman, *Virtual Reality*, 36.

Conclusion



Despite the many downsides to presenting information about the past in a three-dimensional digital format, the process of creating detailed digital models can be beneficial to historic analysis. Information about past buildings such as the Seminary Building and Williston Hall exist in old photographs and written accounts yet require a deeper analysis of multiple sources to be understood holistically. Constructing the model demands an exhaustive examination of the site and its structural properties, exposing features which may not have otherwise been studied by historians. Modelers confront, “the interrelationships between wall thicknesses, materials, building techniques, engineering, and other architectural aspects,”¹⁸ which provide an intricate understanding of the structure. Contemplating the precise way in which walls meet the ceiling, or how windows are aligned with interior features such as stairwells forces the model’s creator to consider vital structural details. Studying the history and site of Mount Holyoke’s early campus in my creation of the models helped answer many of my initial questions about the campus’ past.

The depth of analysis and detailed understanding gained by creating a digital model is intensified through their collaborative nature. As discussed previously, model creation depends on continued upkeep and revision as technology and available information improves. The development of these iterations can “be used to narrate the history of a building, a site, or a city over time, and the storytelling component can itself spur new reflection”.¹⁹ Just as the model of the Seminary Building and Williston Hall represent my own interpretation of the structures from a modern perspective, this perspective will undoubtedly evolve and be further developed in the future by others’ revisions to the model. Through this process of collaborative creation, the shifting interests and interpretations of creators provide a supplementary level of analysis of the space.

18 Favro, *Se Non E Vero*, 273.

19 Caroline Bruzelius. “Digital Technologies and New Evidence in Architectural History.” *Journal of the Society of Architectural Historians* 76, no. 4 (2017), 436.

Unfortunately, this process is not universally accessible. Due to people's varying skill levels, time constraints, financial support for adequate resources, and interest, it is unrealistic for everyone to undertake the same reconstruction process if they desire a more complete understanding of Mount Holyoke's architectural evolution. Presentation of the model in an easily understood format through numerous photographs of its detailed and key components, coupled with the exploratory renderings discussed in the previous chapter, offers viewers an understanding similar to one they would have received if they had gone through the reconstruction process themselves. Viewers are given an understanding of the general structure and features of the campus in the late 1800s without having to sift through multiple documents.

Accurate recreation of the past is impossible and unattainable. Regarding digital models as invalid representations of past structures because of their inevitable inaccuracies discounts the significance of the model as its own entity. Reconstructing the Seminary Building and Williston Hall serves to present information about the structures in a new format, not to make a claim to how the buildings actually existed. Students, faculty, administration, and alumni of Mount Holyoke can use these models in a variety of ways. Rather than discuss Mount Holyoke's rich history to prospective students, the admissions office can show them. Creative writing projects which feature the imagined life of an early student can view the model as a tool for describing the scene. Interest in historically women's colleges can be promoted to the general public by applying the model as the location for a video game, such as the use of an eighteenth-century Parisian reconstruction for *Assassin's Creed Unity*. As the campus continues to expand and considers ways to rebrand, the model can be used to help the administration remember where Mount Holyoke started. Digital reconstructions revive the past and invigorate them with new energy. Adapting archival documents to keep up with technological advancements ensures that this history is not forgotten or ignored.

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Appendix A

All images taken from Mount Holyoke Archives and Special Collections

Seminary Building

Exterior photograph of Library and Seminary



Exterior drawing



Exterior photograph



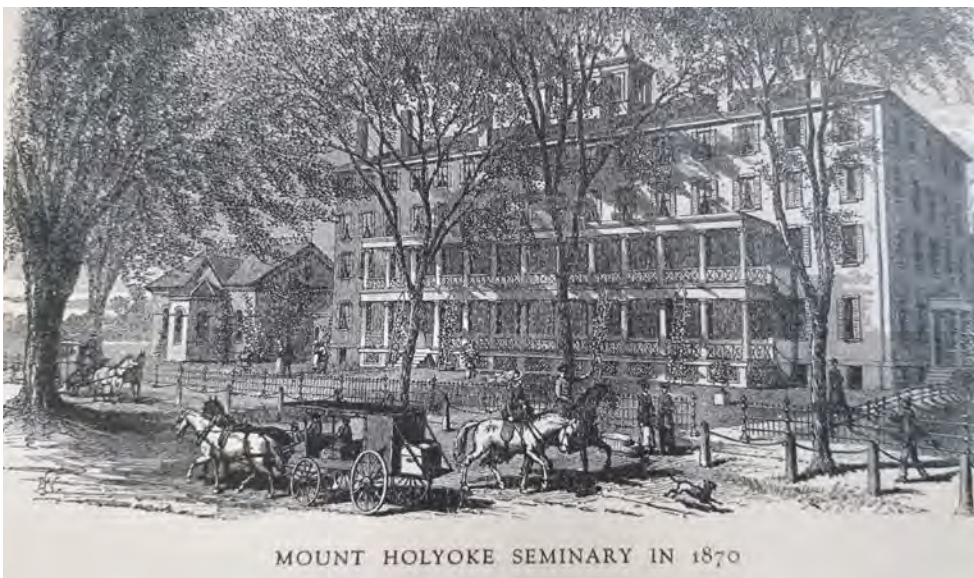


Seminary Building, between 1870 and 1887

Exterior photograph, c. 1870-1887



Exterior photograph, 1894



MOUNT HOLYOKE SEMINARY IN 1870

Exterior drawing, 1870

Photograph of front porch, 1877



Williston Hall and Back of Seminary, 1876

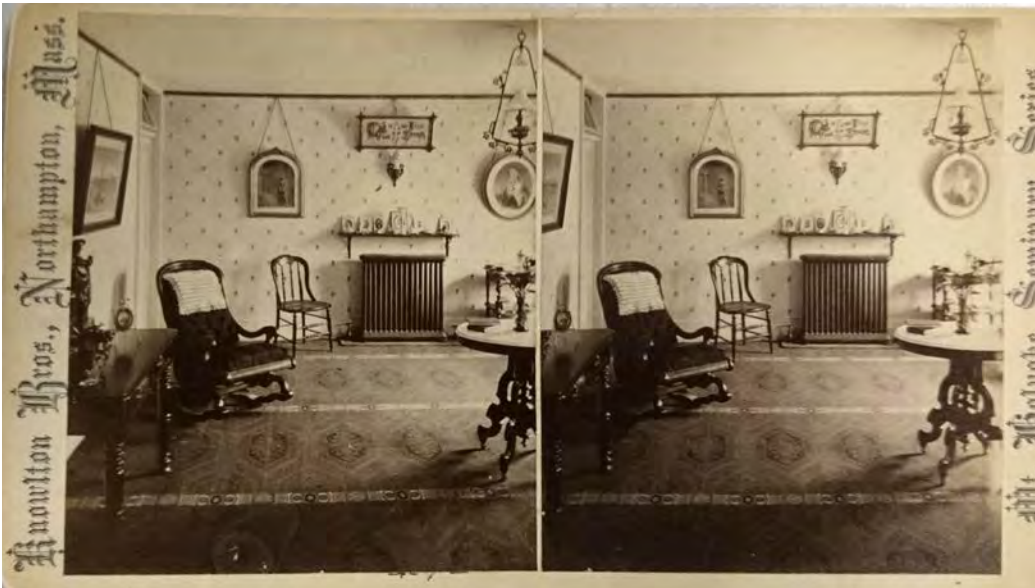


Bathroom Tower





Interior Parlor



Interior Parlor



Interior Parlor



G. N. A. D. and
M. G. 1892

Photographs of Students' Rooms





Students on side steps of Seminary



Student room

Lecture Hall



First floor Lecture Hall



Student room





Gymnasium



Gymnasium



Gymnasium



Students outside Seminary Library window



*Students in first floor
Lecture Hall*



*Students preparing
food in basement*

*Students in
Dining Hall*



*Students in
Art Classroom*



Student bedroom





Ruins after fire





Ruins after fire



Williston Hall



Exterior photograph, 1880



Exterior photograph



Exterior photograph, colorized

Exterior drawing



Exterior drawing



Exterior drawing





Exterior photograph



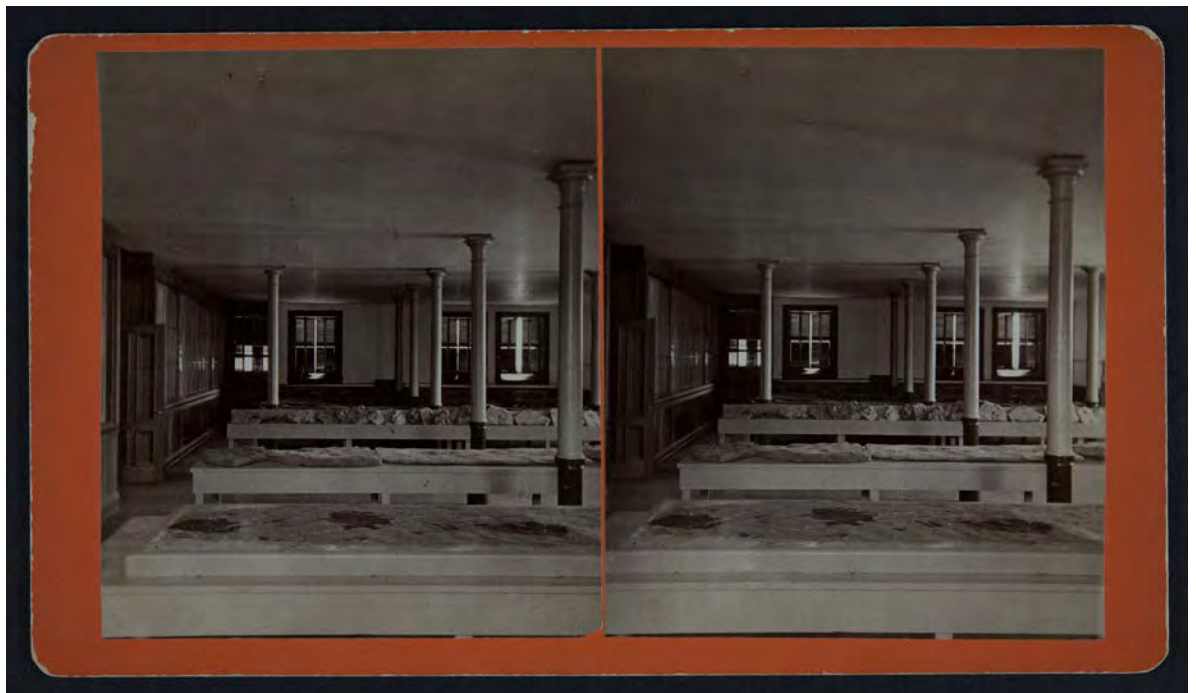
BIRD'S-EYE VIEW OF THE COLLEGE BUILDINGS AND GROUNDS.

Bird's Eye drawing of campus

Geology Classroom



Geology Classroom





Lecture Hall



Lecture Hall

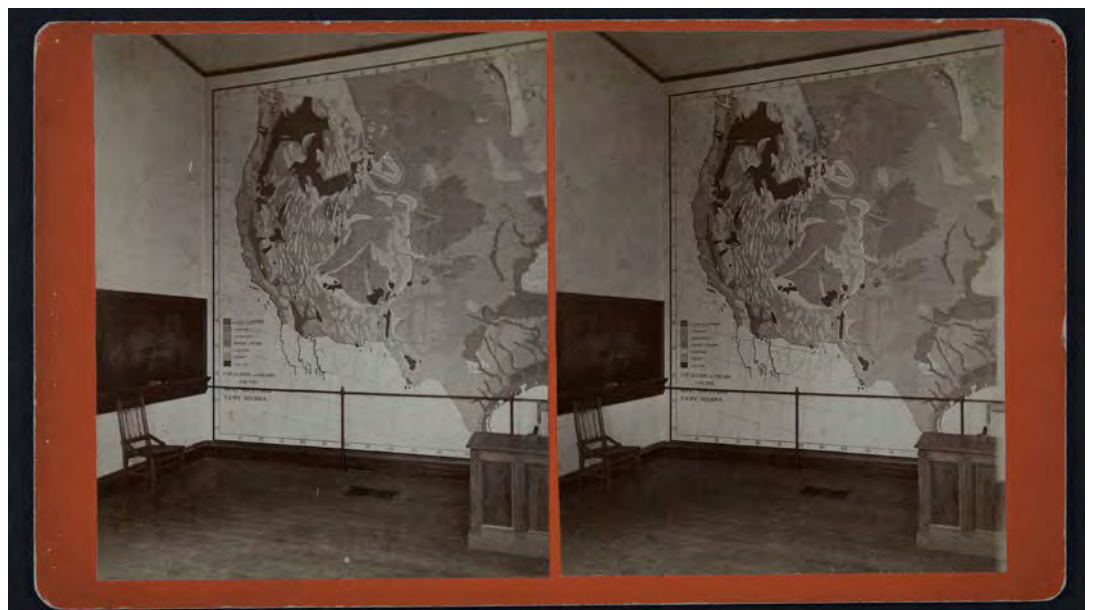
Mineralogical Cabinet



Mineralogical Cabinet



Geography Classroom





*Zoology
Classroom*

THE ZOOLOGICAL LABORATORY.
Lyman Williston Hall.



Zoology Cabinet



Zoology Cabinet





Art Museum



Art Classroom

*Stairwell,
first floor*



Stairwell

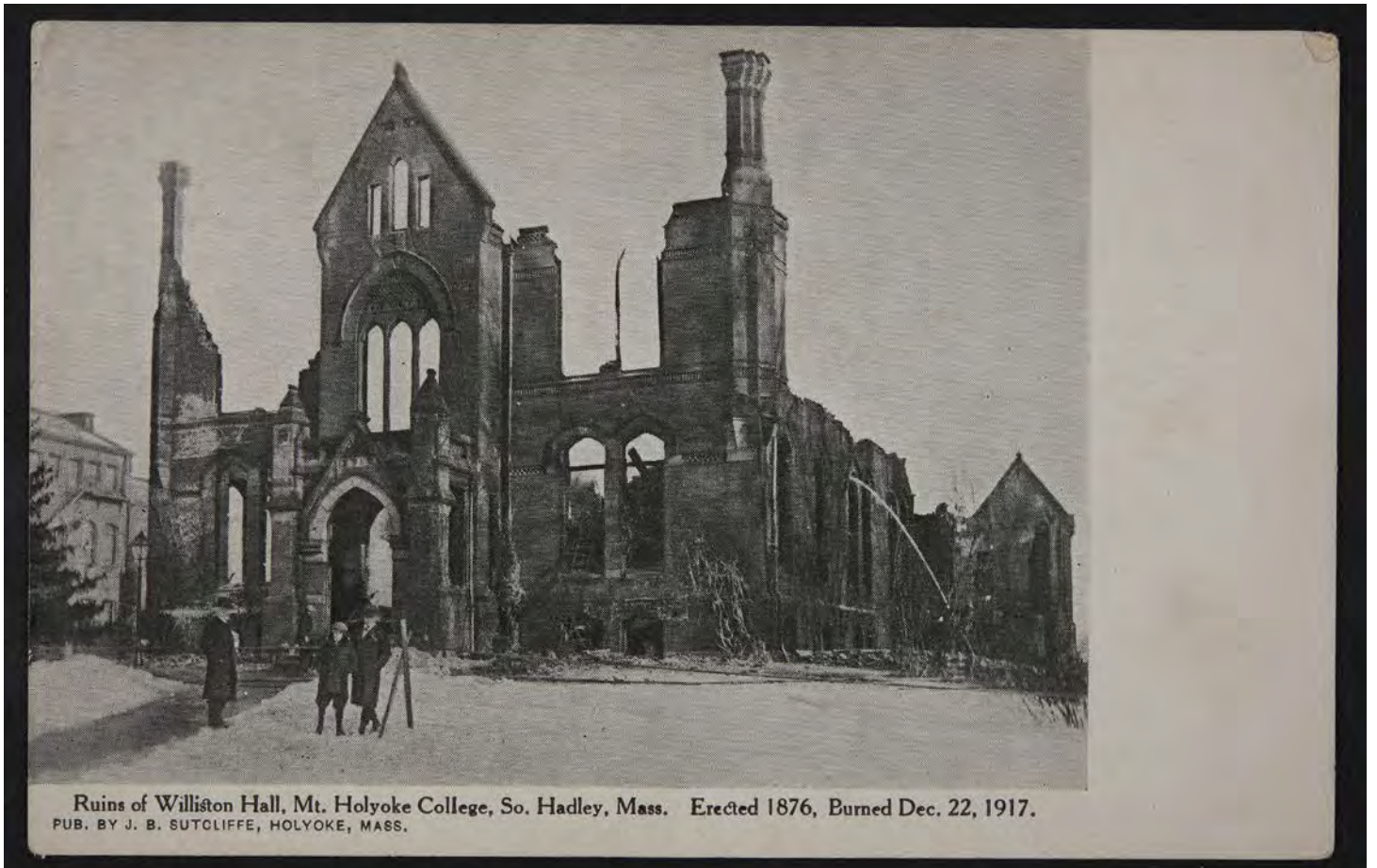


*Graduating Students
on Exterior Stairs*





Students on front steps including Hortense Parker (far right), 1883



Ruins after fire

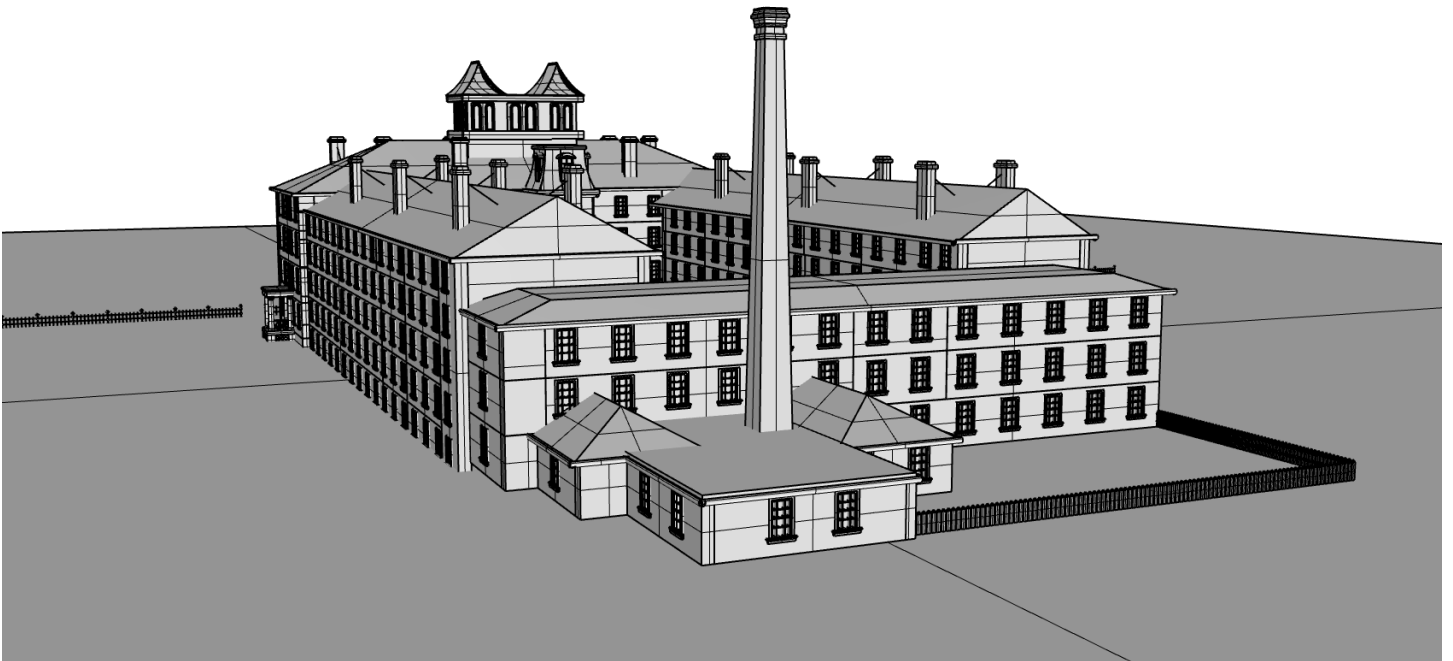
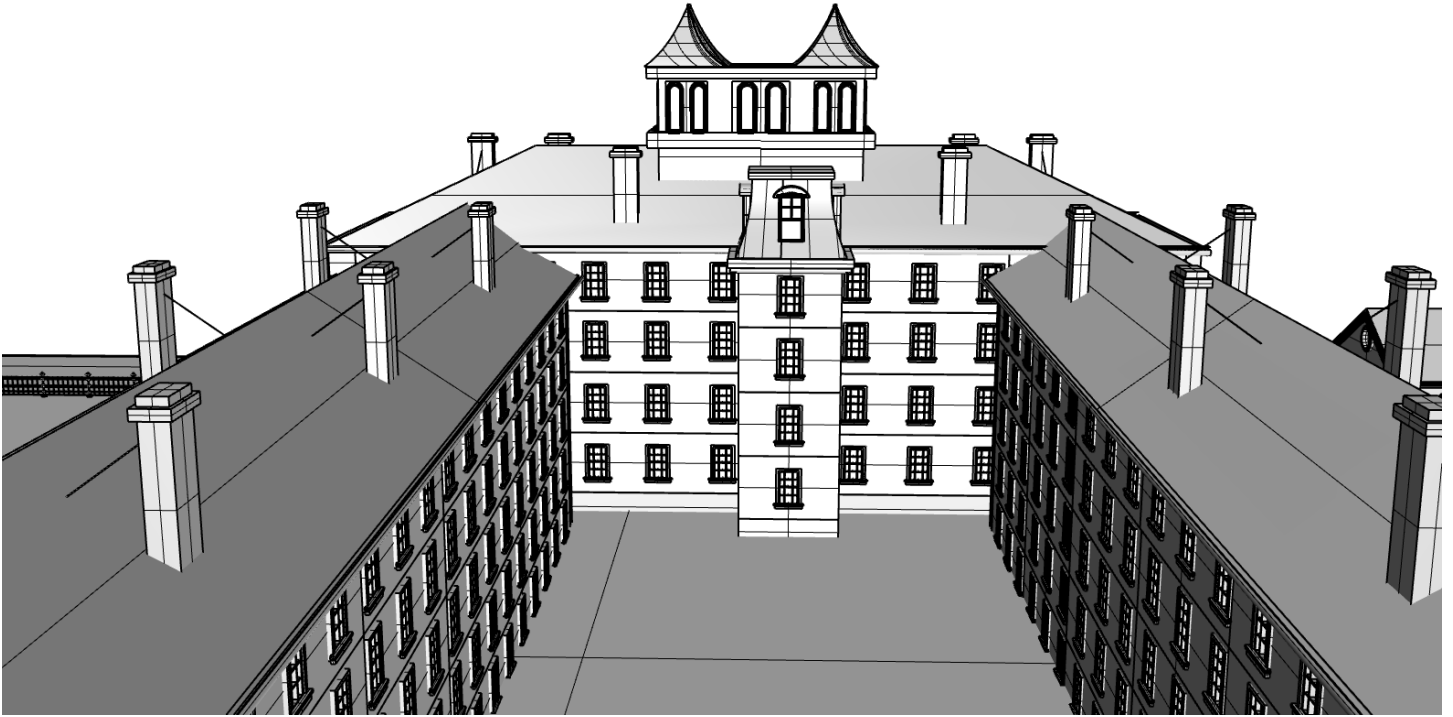


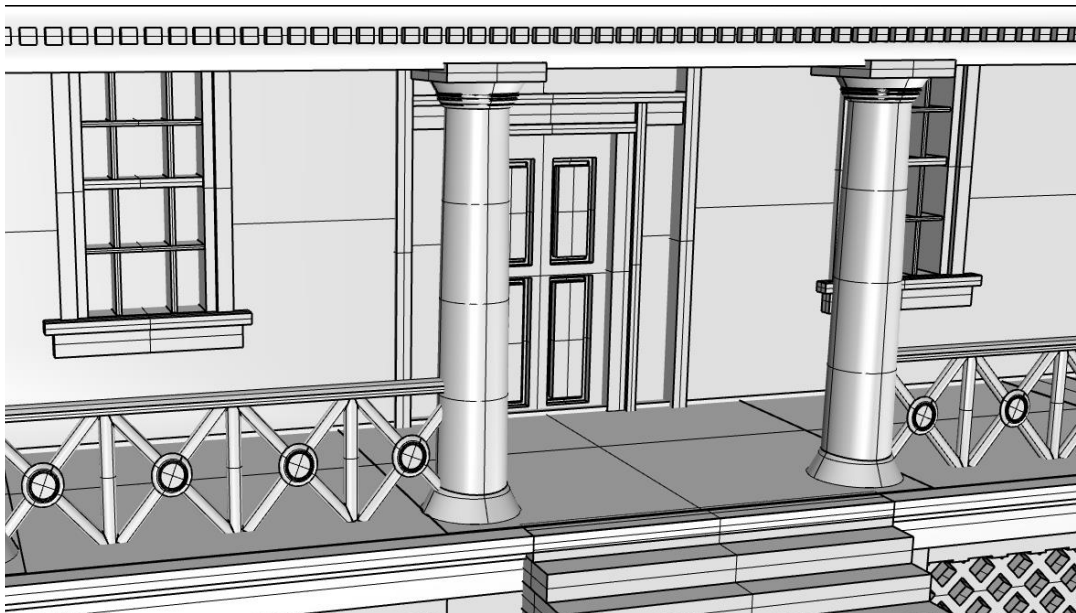
Appendix B

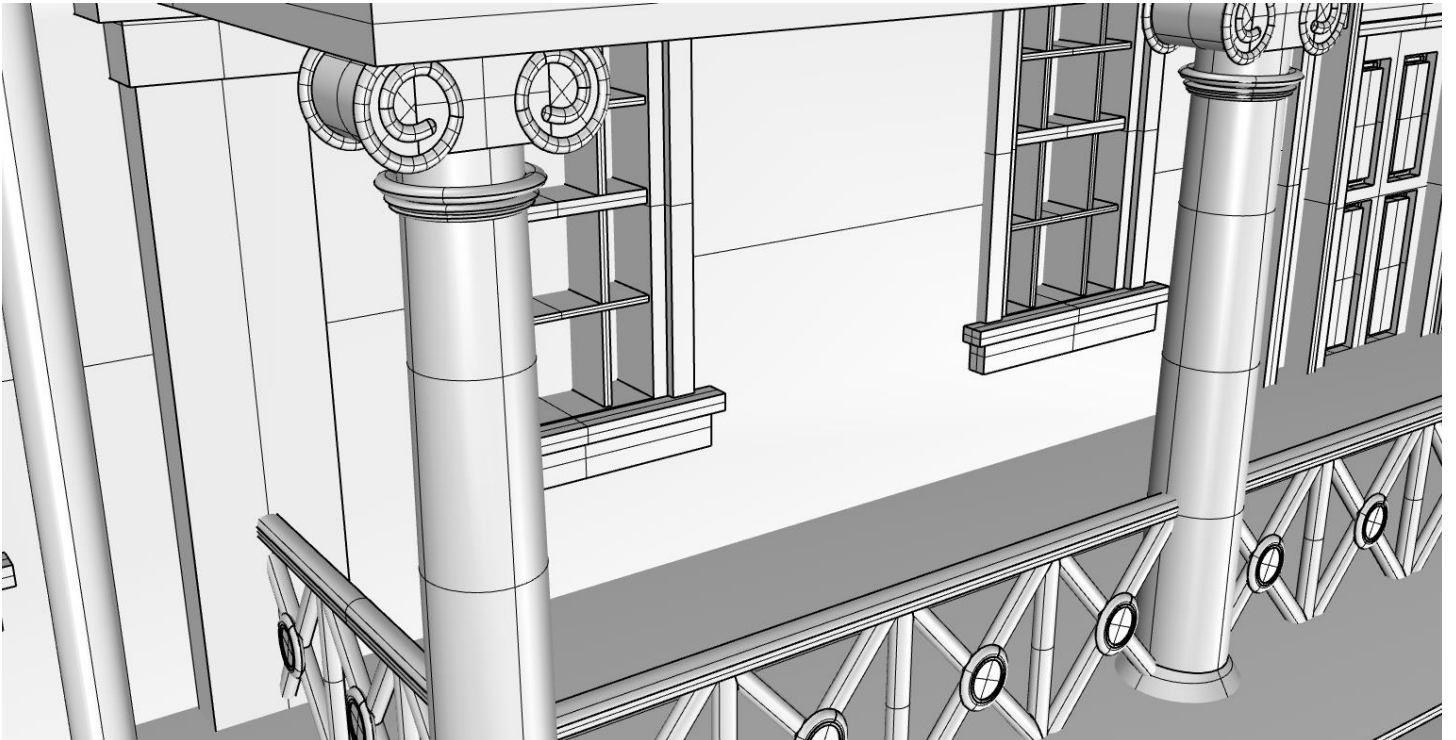
Rhino model documentation

Seminary Building

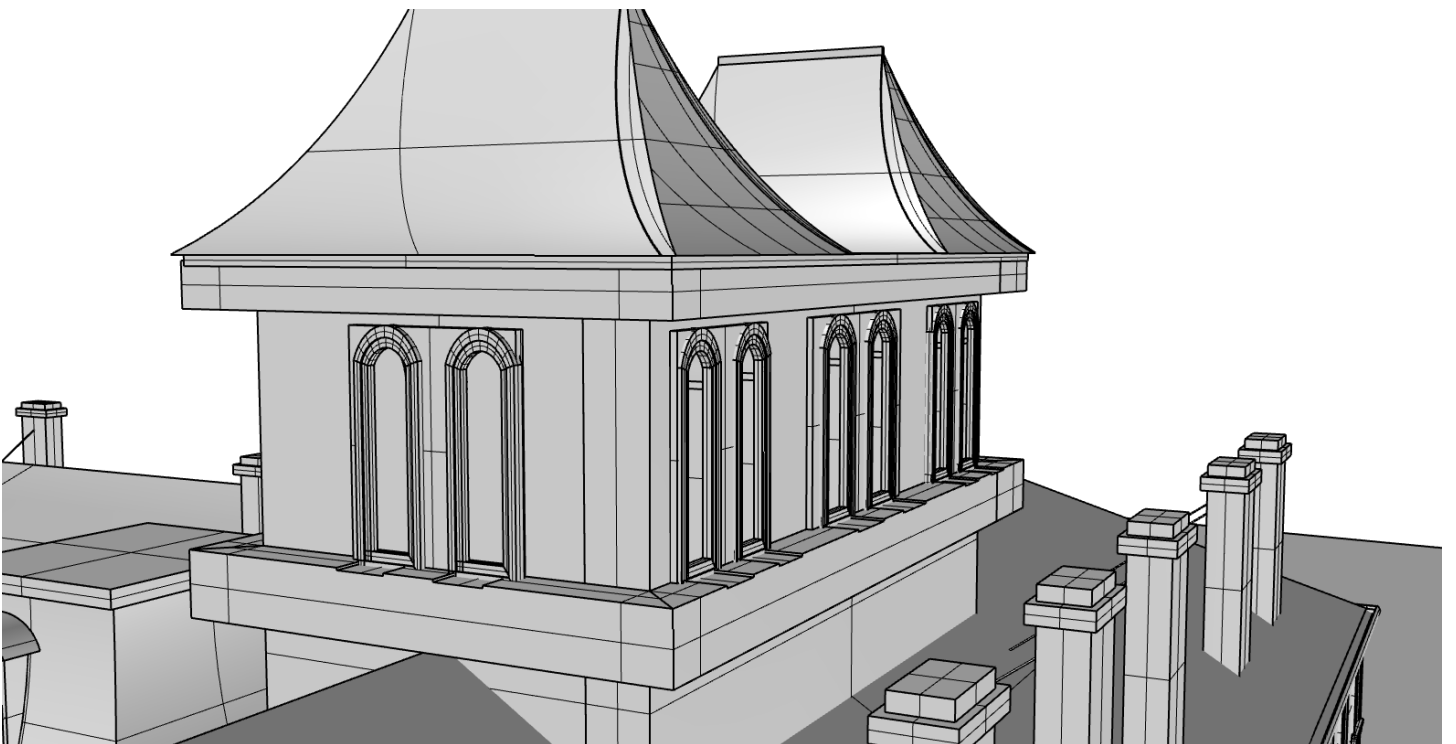


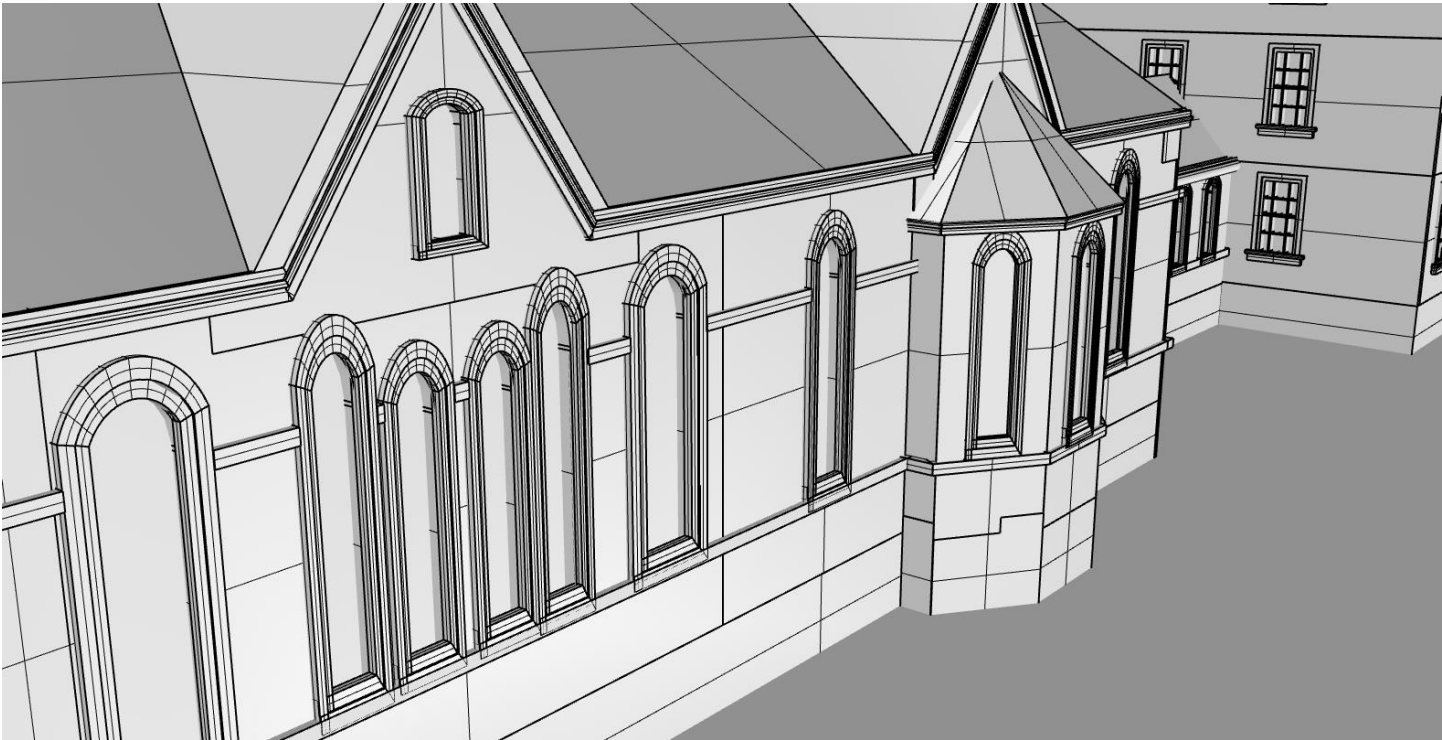




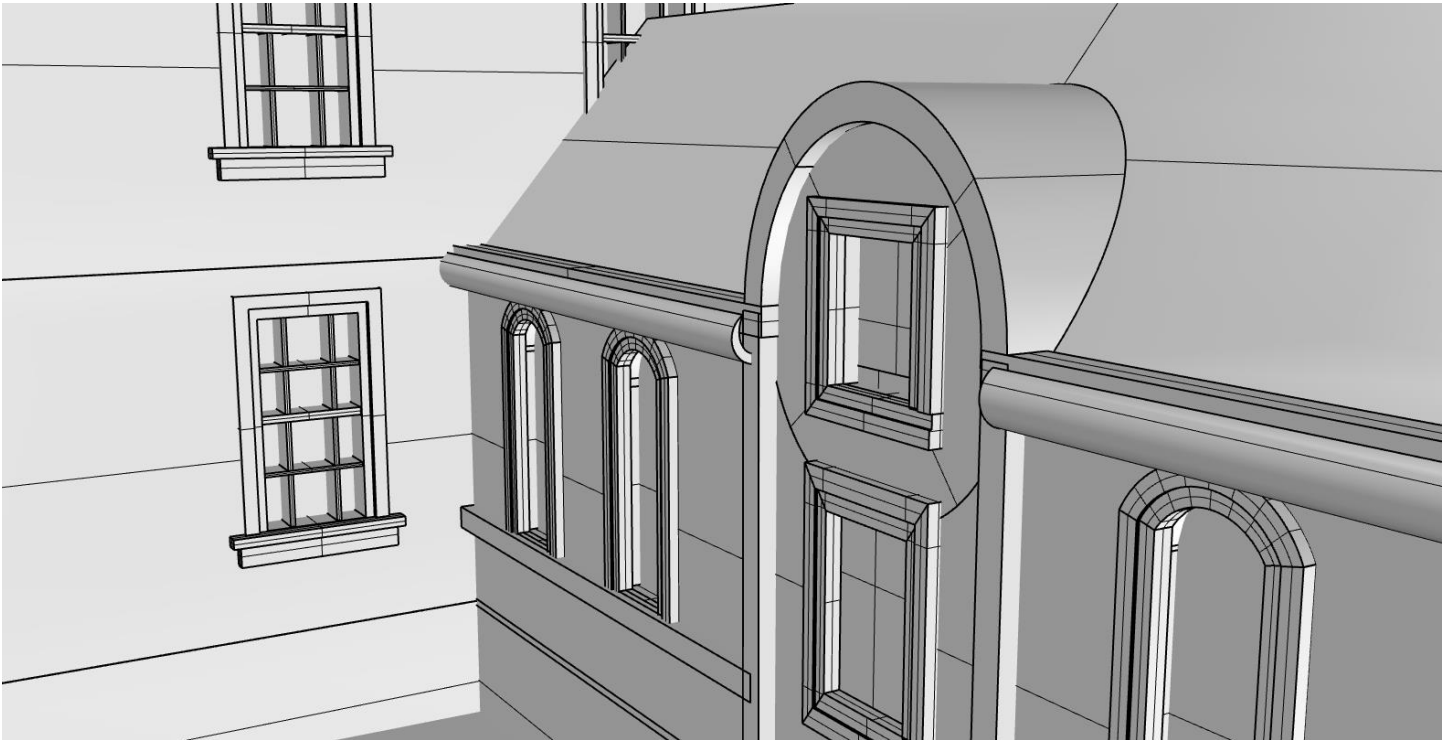


Front Exterior

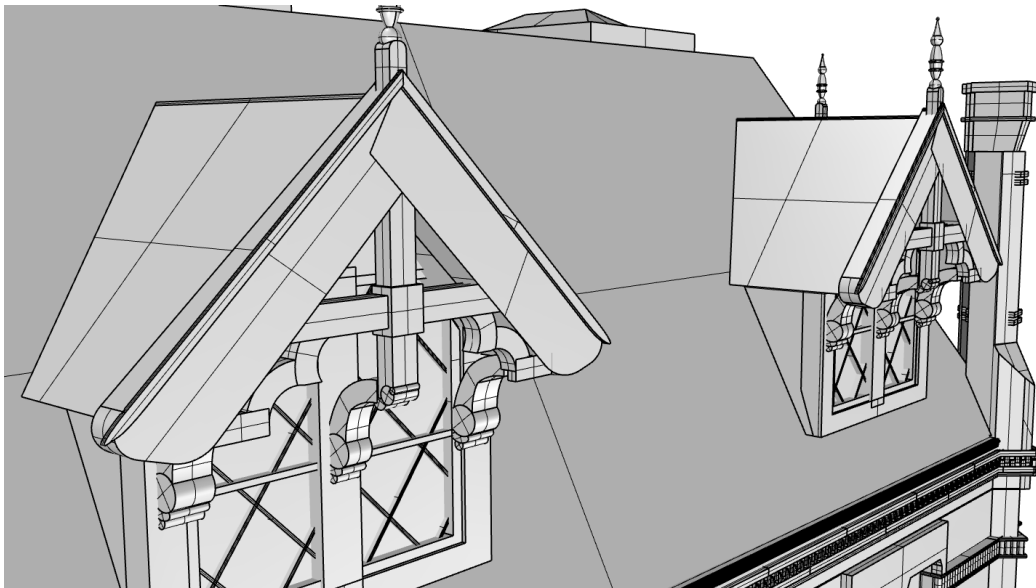
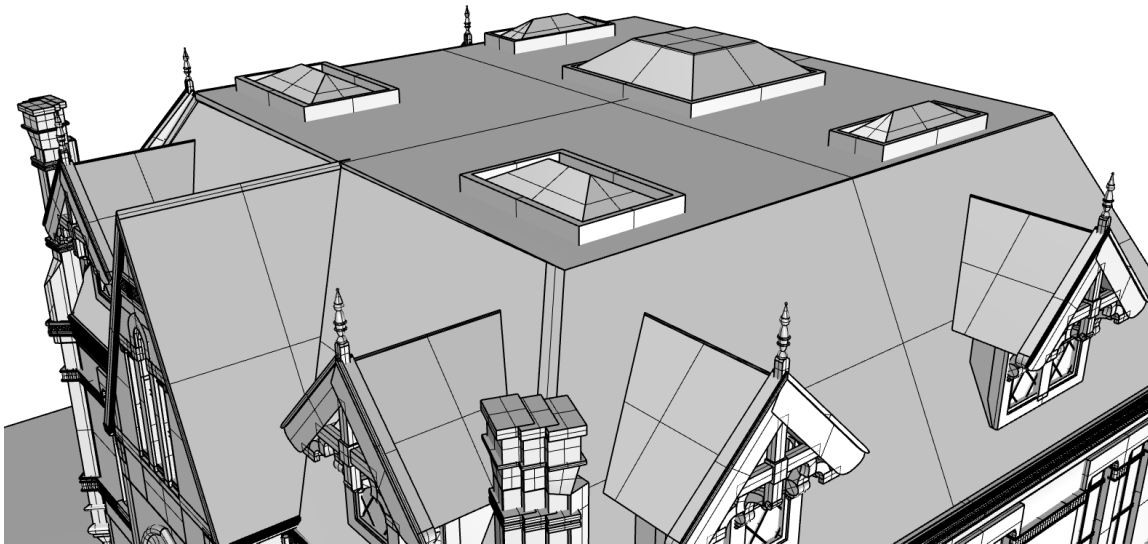


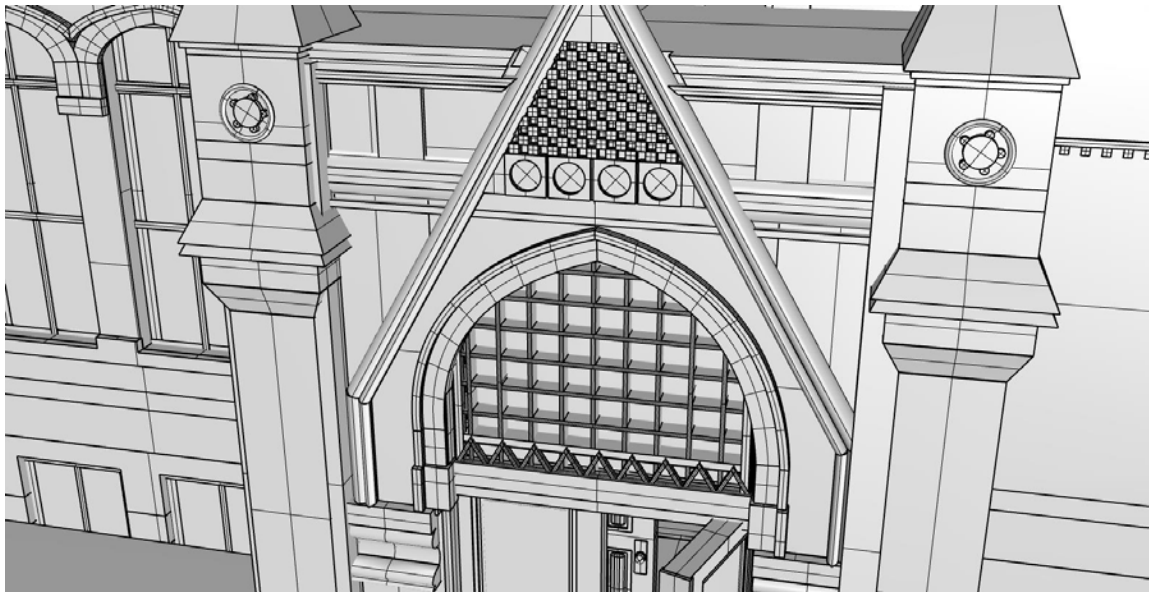


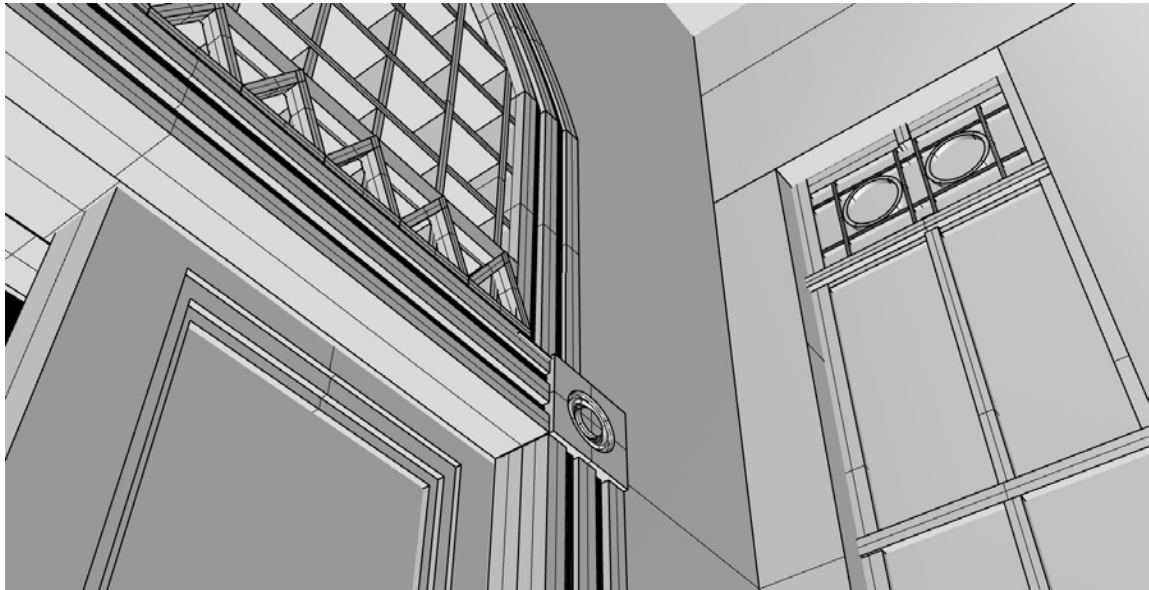
Seminary Library



Williston Hall



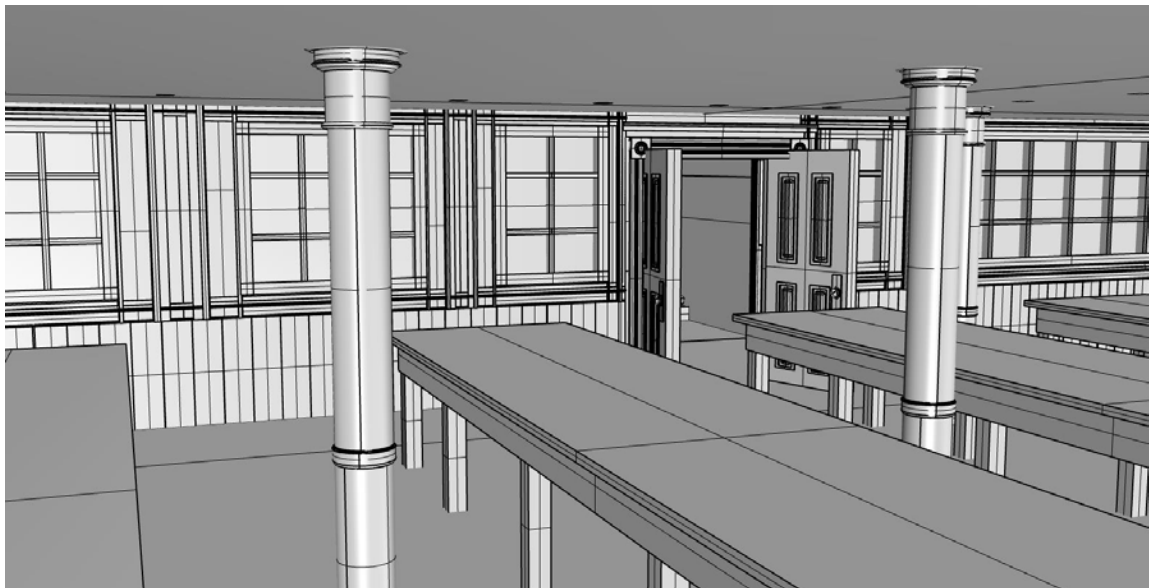




First floor vestibule



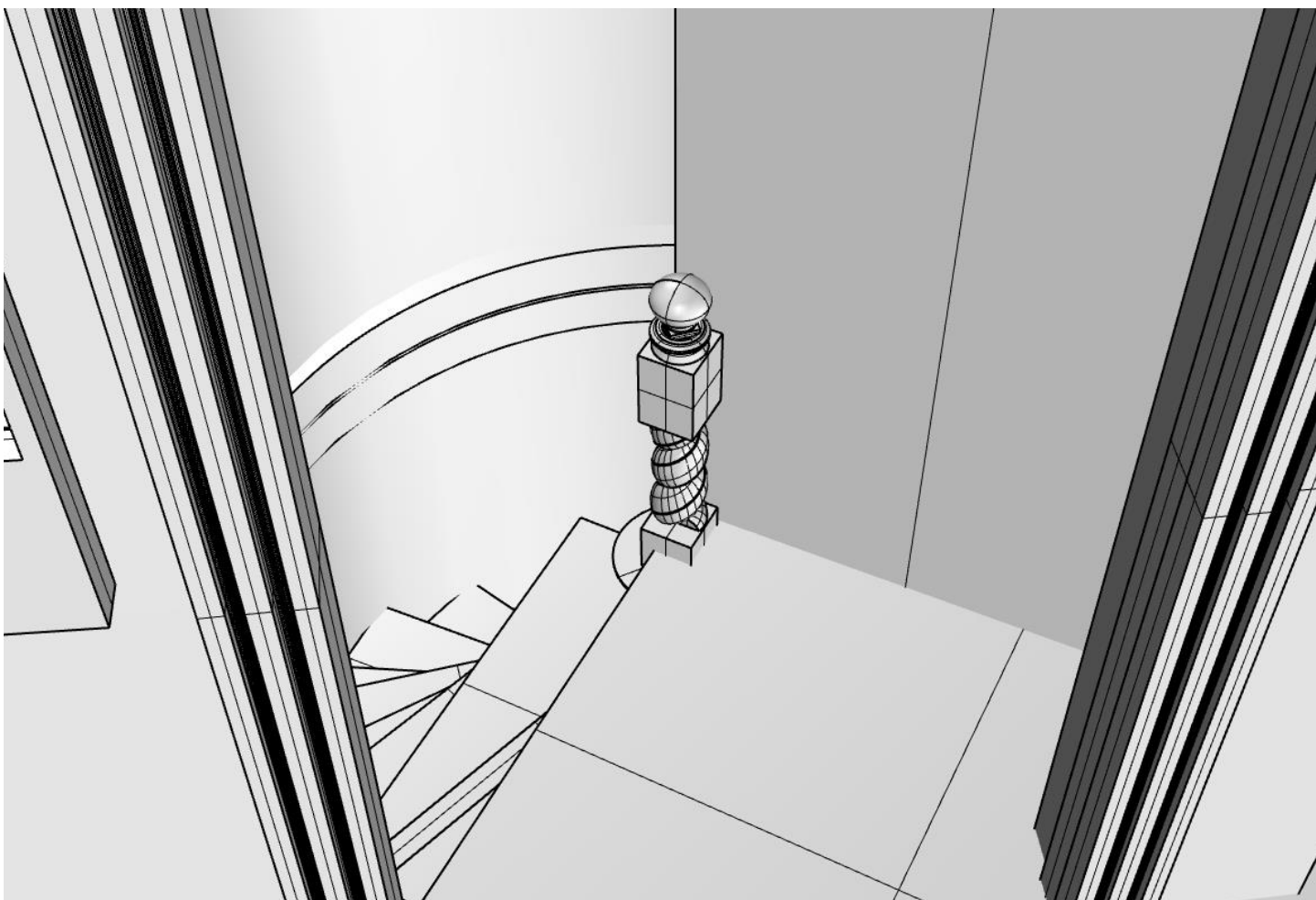
First floor vestibule

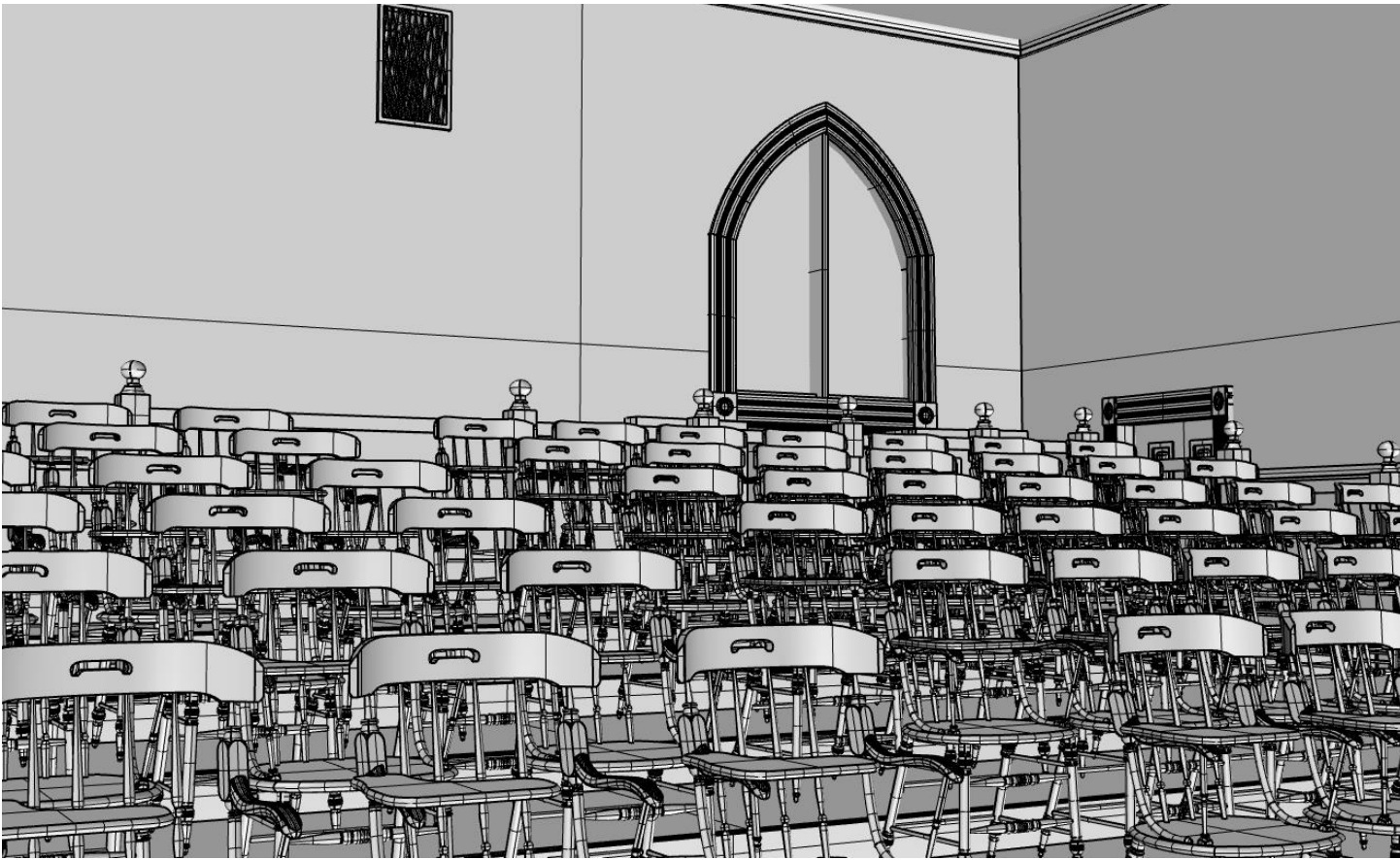


*Basement
Geology
Cabinet*



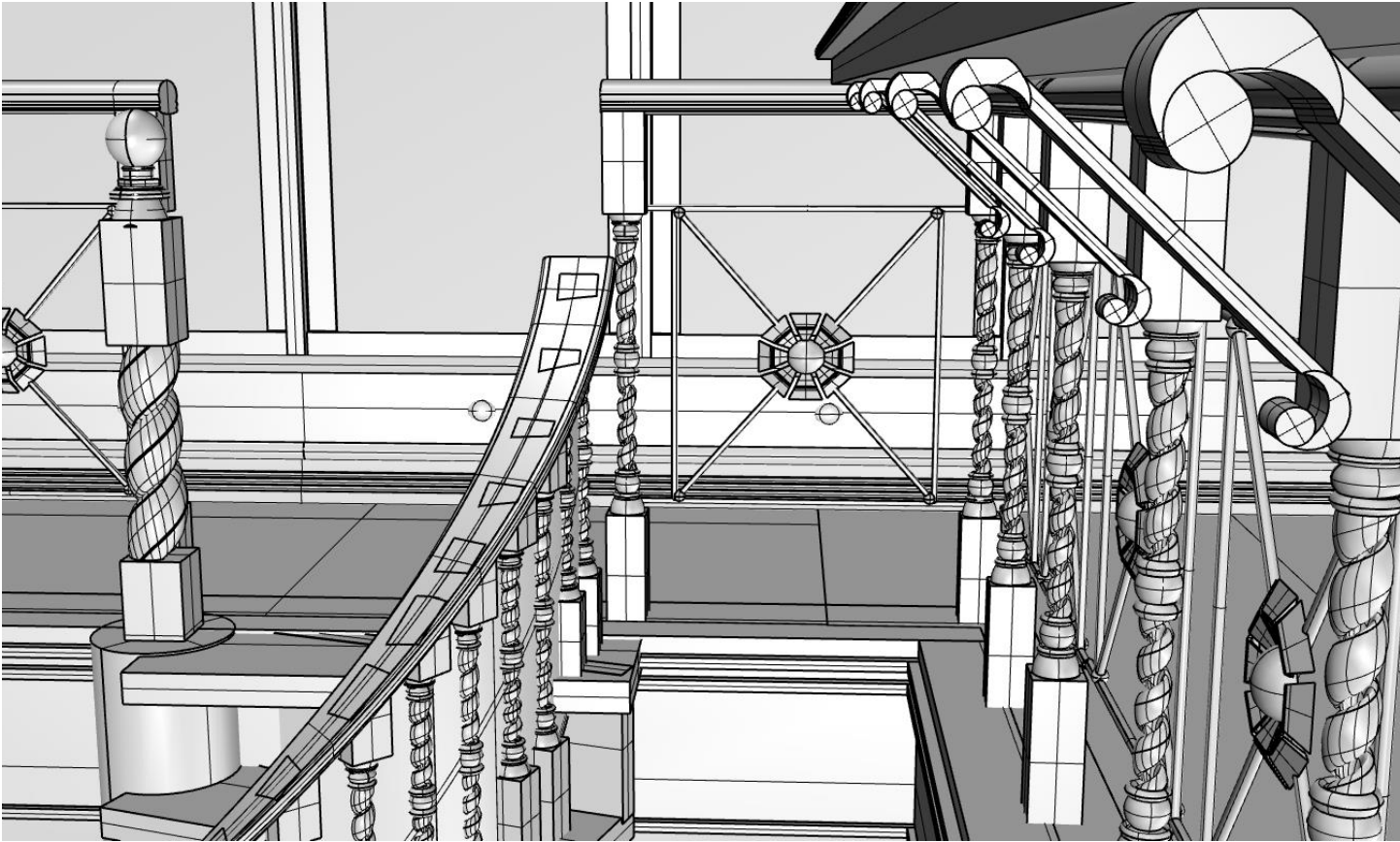
First floor Trustees' Room



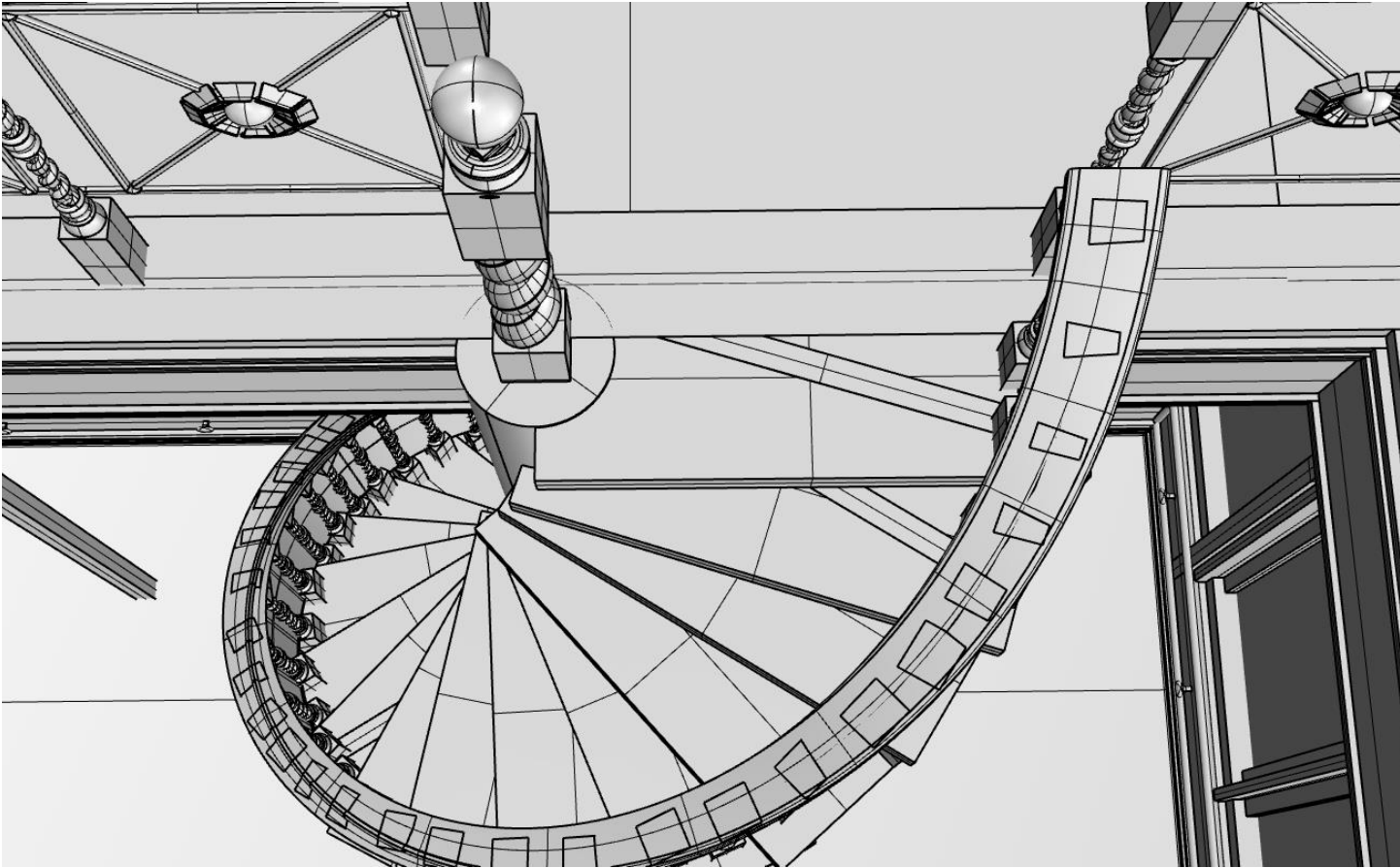


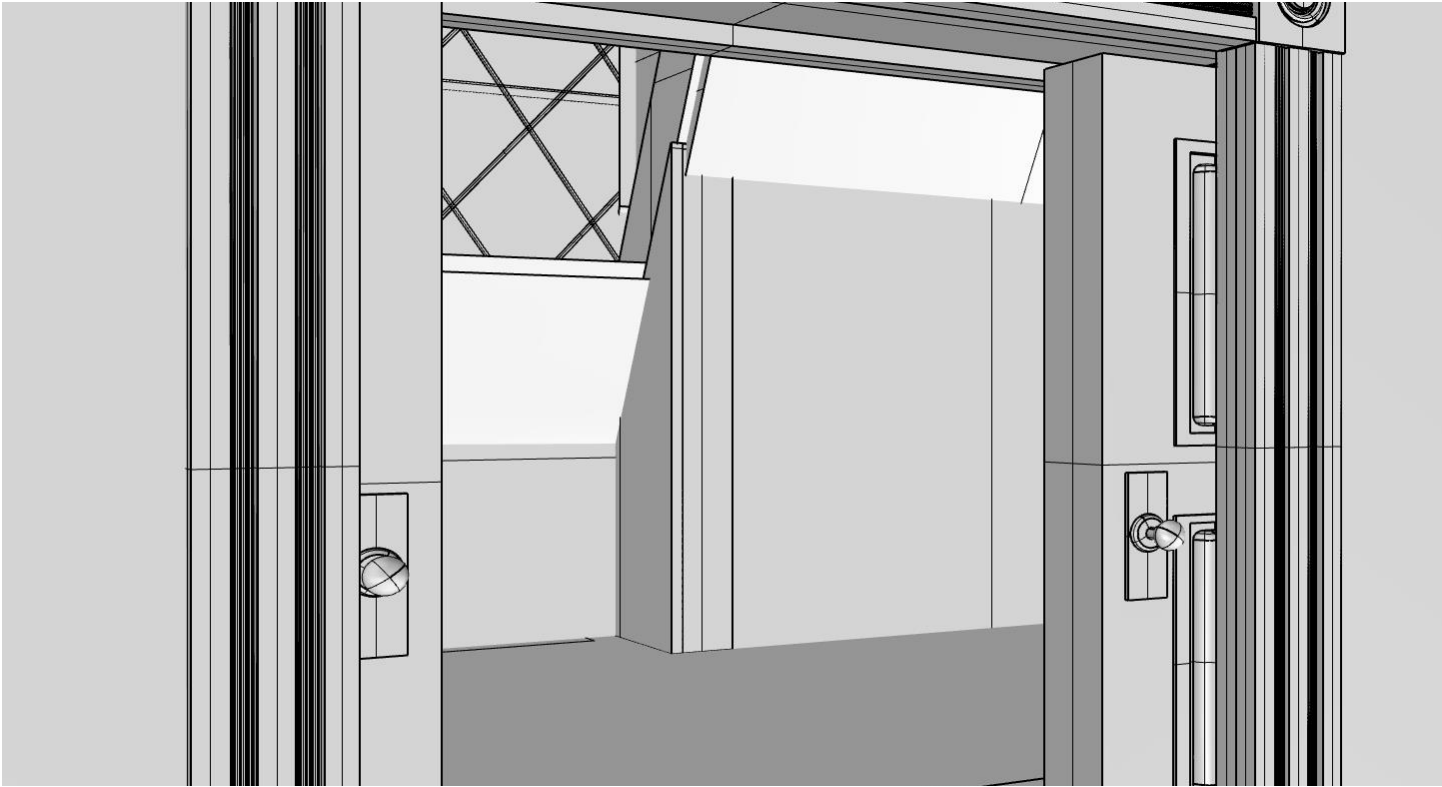
First floor Lecture Hall



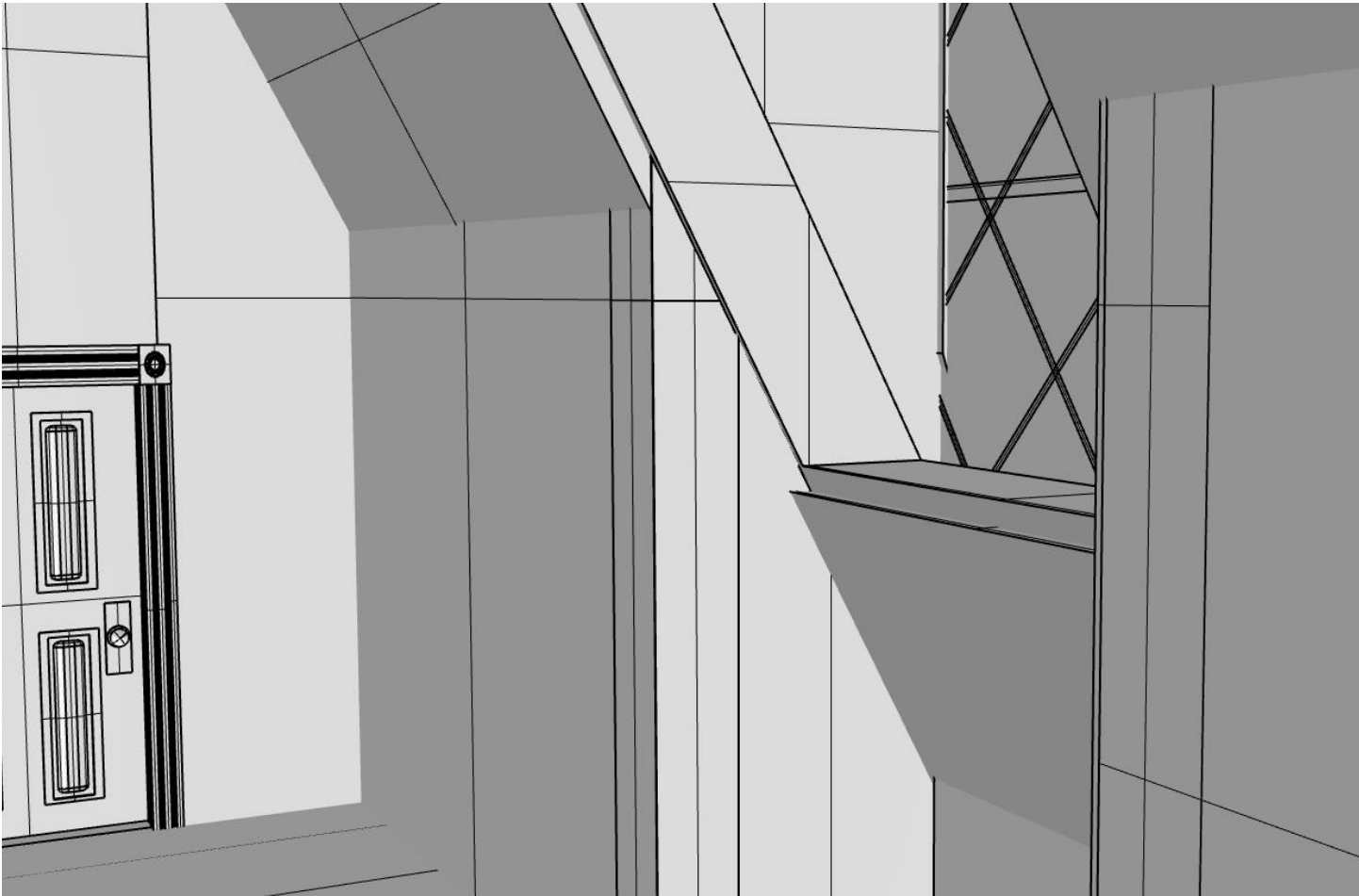


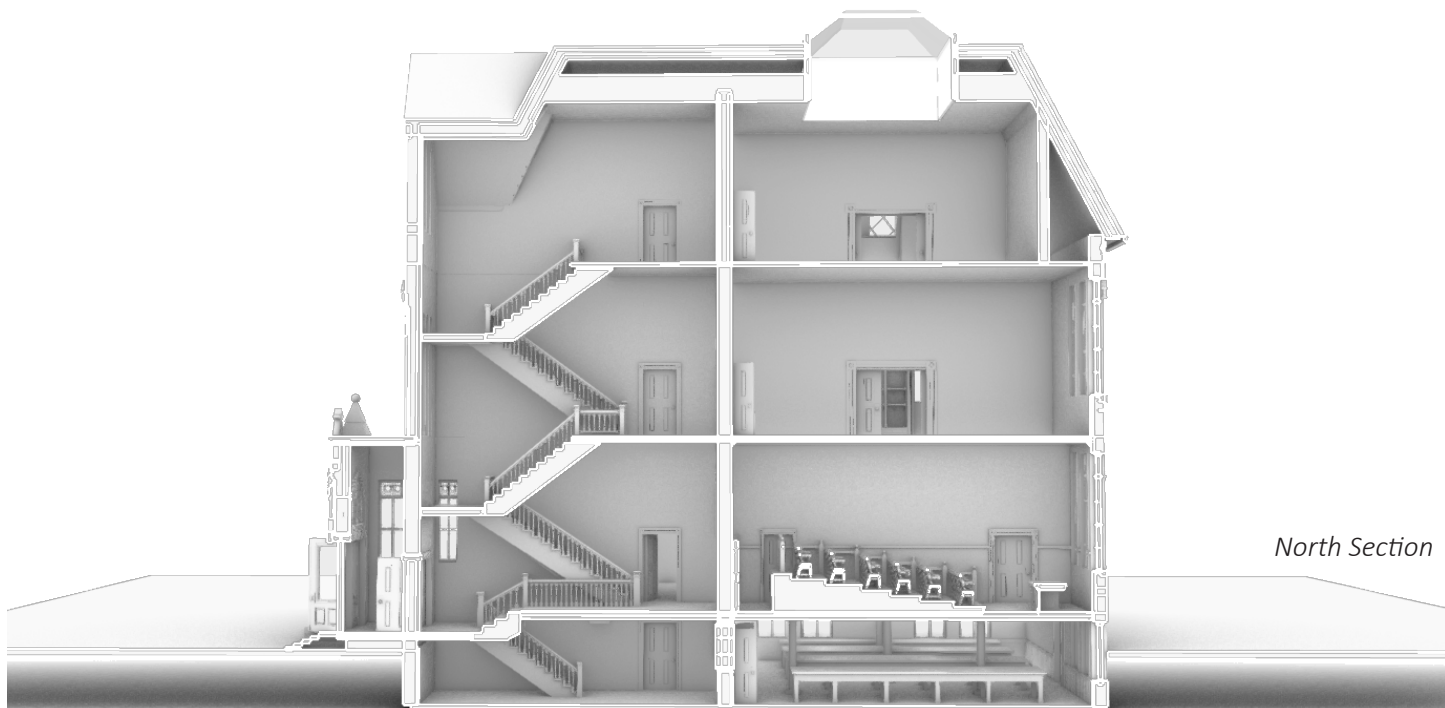
Second floor Zoological Alcove



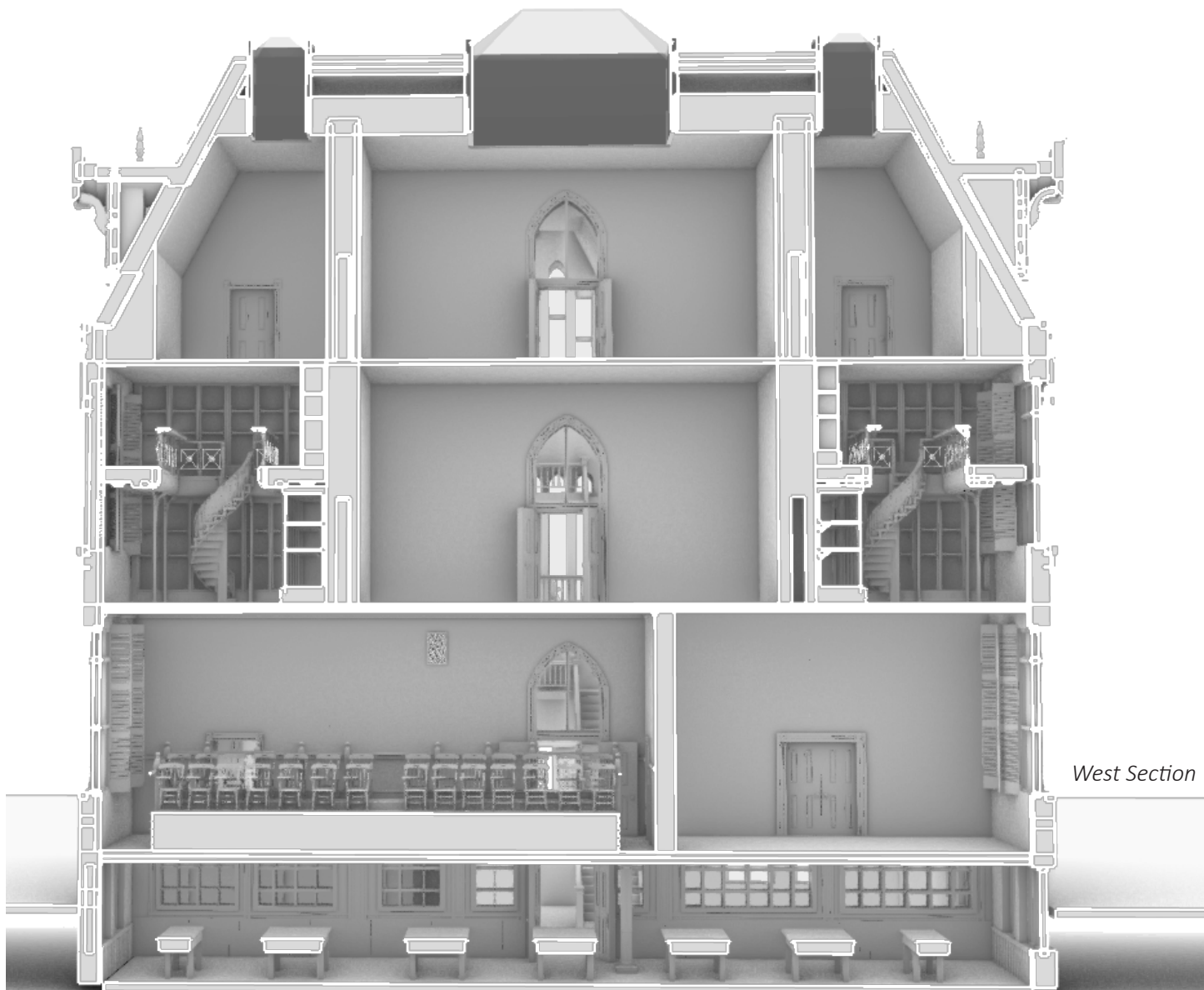


Third floor Art Museum





North Section



West Section

Works Cited

- Boeykens, Stefan. "Using 3D Design Software, BIM and Game Engines for Architectural Historical Reconstruction." CAAD Futures 2011: Designing Together, 2011.
- Bowman, Doug A., and Ryan P. McMahan. "Virtual Reality: How Much Immersion Is Enough?" *Computer* 40, no. 7 (2007): 36-43. doi:10.1109/mc.2007.257.
- Bruzelius, Caroline. "Digital Technologies and New Evidence in Architectural History." *Journal of the Society of Architectural Historians* 76, no. 4 (2017): 436-39. doi:10.1525/jsah.2017.76.4.436.
- Camerlenghi, Nicola. *St Paul's outside the Walls: A Roman Basilica, from Antiquity to the Modern Era*. Cambridge, United Kingdom: Cambridge University Press, 2018.
- Edmonds, Anne Carey. *A Memory Book: Mount Holyoke College 1837- 1987*. South Hadley, MA: Mount Holyoke College, 1988.
- Favro, Diane. "Se Non E Vero, E Ben Trovato (If Not True, It Is Well Conceived): Digital Immersive Reconstructions of Historical Environments." *Journal of the Society of Architectural Historians* 71, no. 3 (2012): 273-77. doi:10.1525/jsah.2012.71.3.273.
- Hoopas, Lauren. *On the Periphery: A Survey of Nineteenth-Century Asylums in the United States*. Ann Arbor, MI: ProQuest LLC, 2015.
- Horowitz, Helen Lefkowitz. *Alma Mater: Design and Experience in the Women's Colleges from Their Nineteenth-century Beginnings to the 1930s*. Amherst: University of Massachusetts Press, 1993.

Bibliography

- Boeykens, Stefan. "Using 3D Design Software, BIM and Game Engines for Architectural Historical Reconstruction." CAAD Futures 2011: Designing Together, 2011.
- Bowman, Doug A., and Ryan P. McMahan. "Virtual Reality: How Much Immersion Is Enough?" *Computer* 40, no. 7 (2007): 36-43. doi:10.1109/mc.2007.257.
- Brooks, Dorcas A. *Situated Architecture in the Digital Age: Adaptation of a Textile Mill in Holyoke, Massachusetts*. Master's thesis, 2011.
- Bruzelius, Caroline. "Digital Technologies and New Evidence in Architectural History." *Journal of the Society of Architectural Historians* 76, no. 4 (2017): 436-39. doi:10.1525/jsah.2017.76.4.436.
- Camerlenghi, Nicola. *St Paul's outside the Walls: A Roman Basilica, from Antiquity to the Modern Era*. Cambridge, United Kingdom: Cambridge University Press, 2018.
- Camerlenghi, Nicola, and Georg Schelbert. "Learning From Rome: Making Sense of Complex Built Environments in the Digital Age." *Journal of the Society of Architectural Historians* 77, no. 3 (2018): 256-66. doi:10.1525/jsah.2018.77.3.256.
- Coulson, Jonathan. "University Planning and Architecture." 2010. doi:10.4324/9780203846353.
- Edmonds, Anne Carey. *A Memory Book: Mount Holyoke College 1837- 1987*. South Hadley, MA: Mount Holyoke College, 1988.
- Favro, Diane. "Se Non E Vero, E Ben Trovato (If Not True, It Is Well Conceived): Digital Immersive Reconstructions of Historical Environments." *Journal of the Society of Architectural Historians* 71, no. 3 (2012): 273-77. doi:10.1525/jsah.2012.71.3.273.
- Hoopess, Lauren. *On the Periphery: A Survey of Nineteenth-Century Asylums in the United States*. Ann Arbor, MI: ProQuest LLC, 2015.
- Horowitz, Helen Lefkowitz. *Alma Mater: Design and Experience in the Women's Colleges from Their Nineteenth-century Beginnings to the 1930s*. Amherst: University of Massachusetts Press, 1993.
- Knoblauch, Daniel, and Falko Kuester. "VirtualizeMe: Interactive Model Reconstruction from Stereo Video Streams." *Proceedings of the 2008 ACM Symposium on Virtual Reality Software and Technology- VRST 08, 2008*. doi:10.1145/1450579.1450620.
- Turner, Paul Venable. *Campus: An American Planning Tradition*. Cambridge, MA: MIT Press, 1995.