

12-12-2013

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http://scarab.bates.edu/community_engaged_research/6

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The History of Lewiston's Waterfalls, Canals, Mills, and Water Systems

Hadley Dawson, Tyler Grees, Adelaide Makwaia, Derek Murphy

Executive Summary

“The History of Lewiston’s Waterfalls, Canals, Mills, and Water Systems” is a community-based research project affiliated with Museum L/A that concentrates on understanding the roles of the canals, waterfalls, mills, and waterpower throughout the history of Lewiston. In addition to a historical analysis we aimed to highlight the importance of preserving the origins of Lewiston’s sense of place. Included in the report is a historical narrative that uses sense of place to tell a story about the canals and water systems of Lewiston, Maine. History of place is an integral element that led to the development of Lewiston, as we know it today. Lewiston’s natural characteristics and the potential power that the landscape held attracted progressive industrialists. Powered by place and financed by Bostonian entrepreneurs, Lewiston appeared on the map as an industrial force.

Due to our project’s historical nature, we focused our research on finding and interpreting information from historical sources like Bates’ Muskie Archives, the Lewiston Public Library, and Bates’ Ladd Library. We also depended on Internet sources and comparable locations like the canal systems of Lowell, Massachusetts, to further understand canals and waterfalls as a system. In our final deliverable for Museum L/A we created an informative poster that discusses the canals, waterfalls, mills, and waterpower that has defined Lewiston throughout its history. The poster also includes a map of the canal system that helps to better understand the overall system and how each component worked together. In the end we aim to deliver a final report that will accompany our poster and will allow for a deeper understanding of the history of Lewiston’s canals and water systems.

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Introduction

This project focuses on researching and understanding the historical connection between Lewiston's canals, waterfalls, mills, and waterpower. The aim of this project is to research the roles that the canals and waterfalls played in providing power for the mills. We will be investigating how these factors worked together to create useable hydropower in the Lewiston-Auburn area. Some areas that we will be exploring include the history of the canals and waterfalls and how they worked together to power the mills; the history of how humans transformed the river to accommodate the industrial surroundings; and the history of hydroelectric power and how energy was extracted from water.

A large part of historical literature within Lewiston looks at the socio-demographic conditions of a place. This has helped us understand the connection and relations between communities and place. For example, most literature we have encountered focuses on personal documents and experiences, such as the histories and stories of immigrants working in Lewiston's mills. Much of this historical literature is limited, as it does not provide a vivid understanding of how the synthetic and the natural worked together. Our project's rationale mainly revolves around the importance of preserving the origins of Lewiston's sense of place. For the city of Lewiston this "sense of place" can be found in its rich historical background of the Androscoggin River, waterfalls, canals, industries, and diverse community. These serve as some of the most important factors that helped convert Lewiston from a town into a city, promoted daily interactions, provided sources of income, and most importantly, gave locals a sense of pride in being part of a growing city, the "Magic City". In understanding the historical context of the interdependent relationships between Lewiston's canals, industries, and water systems, one can appreciate the storyline of Lewiston's transformation into a booming mill city.

Methodological Approach

In order to successfully pursue a project that required a great amount of research, our group found it necessary to collectively gather as much information as possible from as many different types of sources as possible. In doing so we were able to compile an assortment of resources, allowing us to more accurately tell the detailed story of Lewiston's early industrial beginnings. We worked in collaboration with Diane Williams at Museum L/A to develop a research framework and to further guide us in understanding Lewiston's water systems history. Our group collected research from the Bates Ladd Library, the Lewiston Public Library, and the Edmund Muskie Archives. In addition to these sources, we reached out to Lewiston Water Works and to Central Maine Power to gather more information on the civil engineering behind Lewiston's waterways, but unfortunately we did not receive useful feedback within the scope of our project.

For the purpose of data collection we had also collected and interpreted information that we had encountered both online and offline. However, we were more inclined towards journals, books and primary data collected from the Muskie Archives. Moreover, our project had drawn information from other mill towns, such as Lowell, Massachusetts, to gain an understanding of how canals, waterfalls, and mills work together to complement each other. Most of the information was readily available to us online and in both the Lewiston Public Library and in the Bates Ladd Library. Through the course of our research we worked with the Muskie Archives supervisor, Elaine Ardia, and similarly with the Lewiston Public Library, as we attempted to understand and interpret these primary and secondary documents.

As far as weaving through and piecing together this large amount of research, we had planned on dividing the features of the project individually so that we could later reconvene with

a more detailed understanding of how our individual parts worked. We separated the work into four key subcategories: the waterfalls of the Androscoggin, canal construction, hydropower, and mill construction and development. Breaking the larger scope of the project into smaller segments allowed us to see both the independent and overlapping aspects of these subcategories to reveal how each component worked with one another to produce a water system vital to Lewiston's early advancement. Once we had gathered all relevant information, we met with William Ash at the Bates Imaging Center to guide us in creating our final deliverable. For our final deliverable we created an informative poster, incorporating both historical photographs and our own diagram to demonstrate the workings of the Lewiston water system.

Results and Discussion

Results

This section of the report explores four of the main components that define the history of Lewiston's water systems. These four components include: the Great Falls, the canals, textile mills, and hydroelectric power. These components will be discussed in the context of how they each complemented and added to Lewiston's water systems. A large part of our findings reveals the ways in which these components worked as an interconnected system whereby the development of one component highly depended on the presence of another. We further discuss the importance of Lewiston's geographical location as being an integral factor in the city's economic productivity and civilization. The following sections discuss the history of each component within Lewiston's water systems.

Waterfalls

The first people to see the potential of Lewiston's water in providing hydroelectric energy was a group of local men in Lewiston (Hodgkin, 2008). By selling company stocks within Boston markets these men were able to draw more attention to Boston investors such as Benjamin Bates who further financed the textile mill industry in Lewiston (Rand, 1975). Therefore, looking back at the initial stages of Lewiston's textile mills, we can confidently contend that Lewiston's water power was a stepping stone into the development and growth of the city.

The Androscoggin River's natural power played a great role in transforming the city's economic capabilities. Dropping from 1,245 feet, the Great Falls was the steepest gradient of any Maine River that catered to power generation and ultimately to the productivity in textile mills

(Cupid *et al.*, 2012). The idea of hydroelectric power depended on energy from the waterfalls generating power for each mill's power generation stations. The Androscoggin River's "power machine" was found in the Great Falls, and this natural energy helped further Lewiston's textile industries (Sargent, 2010).

Canals

Privately funded by Benjamin E. Bates, the canals had undergone construction in the early part of the 1850s with the goal of capitalizing on the great natural potential that the Androscoggin Falls had created (Hodgkin, 2003). Downtown Lewiston consisted of five interrelated canals that collectively work together to create energy for the mills. The Upper canal is the key canal responsible for transporting water from the Androscoggin River to the mills, the dimensions of which are 60 ft. wide and 11-14 ft. deep. The Upper canal meets the Androscoggin River at the Union Water Power Company Gatehouse, which was constructed in 1851 and is the site that is solely accountable for the regulation of water that flows into the Upper canal (Anderson, 1982). As the water enters the Upper canal, it is then redirected into two different cross canals that then flow into the Lower canal, bringing the flow of water to the mills that are less inland and closer to the banks of the Androscoggin.

In the process of creating waterpower, canals play the role of energy transporter as they filter the water from the Androscoggin directly to the mills. With reference to Figure 1, and in relation to the Erie and Pawtucket canals that served as models for the Upper canal, the step-by-step process for the use of canals in the creation of waterpower closely resembles the following (Sheriff, 1997). The water that enters the Upper canal via the gatehouse flows through the canal and as the canal perpendicularly meets the cross canals, the superior elevation of the water in the

Upper canal then falls down into the cross canals, creating a current in the water flow that moves underneath the mills via mill arches, ultimately spinning the turbines within the mills (National Park Service, 2013).

Most credit for canal construction is given to the group of investors who had financed this complex project. However, it is important to acknowledge the people who had truly constructed this grand structure. Led primarily by Irish and French-Canadian immigrants, many men had traveled to Lewiston sacrificing the culture of their homeland for the opportunity to find work to further pursue the American Dream (Museum L/A, 2013).

Hydropower

To provide power for the mills in Lewiston, water from canals flowed through an opening in the basement of the mills (“Suffolk Mills Turbine Exhibit”). Rushing water flowed through the opening and into buckets, originally called breastwheels, which rotated as they became full of water (Pfeiffer). The weight of the water in the breastwheels propelled the waterwheel in circular motion (Pfeiffer). “Turning at a relatively constant rate, the water wheel was attached to a vertical shaft through two bevel gears arranged at a ninety degree angle to one another” (Pfeiffer, 44). This allowed for the conversion of stored energy into useable, kinetic energy (“Suffolk Mills Turbine Exhibit”). Machines within the buildings were arranged in long lines so that harnessed power could travel the length of the building (Pfeiffer).

Later, due to frequent malfunctions and unproductive outcomes, a new design of a belt-and-pulley system was devised in 1828 (“Suffolk Mills Turbine Exhibit”). In this system a flywheel transferred stored power from the main shaft to smaller shafts and then to individual

looms, thus creating a more efficient system (“Suffolk Mills Turbine Exhibit”). This allowed for a smoother and more productive system of hydroelectric power.

Mills

Originally, Lewiston was an agriculturally dominated landscape that focused on the cultivation of grains like flour and the harvesting of trees (Merrill, 1891). To reduce the intensive labor it took to turn these raw materials into products, early settlers like the Frye, Garcelon, and Little families sourced the Androscoggin River for its natural power (Sargent, 2010). In 1809, a rudely constructed timber dam and canal marked one of the first attempts to harness waterpower on the Androscoggin (Sargent, 2010). Michael Little built a large wooden mill complex at the location of present-day Lincoln Mill (Sargent, 2010). It accessed the stored energy by the early dam and canal system to power a saw, grist, and fulling mill. These three types of mills were most popular during the early 17th century (Merrill, 1891). A sawmill used hydroelectric power to propel a saw that would cut and finish harvested trees into profitable wood products. A gristmill used energy drawn from the canal to lift and drop a heavy stone, crushing grains into products like flour. Fulling mills used waterpower to assist in the cleaning process of raw materials like cotton (Merrill, 1891). Unfortunately, the Little’s mill complex burned down by a suspected arsonist in 1815 (Sargent, 2010). The power that the landscape of Lewiston offered had now been witnessed, marking the beginning of an anthropocentric partnership with the Androscoggin River.

Joseph Harding introduced the manufacturing of cotton in 1844 (Leamon, 1976). Harding’s success was noticed by a few of Lewiston’s leading entrepreneurs and in 1845 they collaborated as the Lewiston Falls Cotton Mill Company and began to construct a cotton mill

(Leamon, 1976). Before the mills completion it was bought by Lewiston Water Power Company, which soon became the most significant businesses in Lewiston (Leamon, 1976). The organization made plans to establish a power site at the Great Falls that would control water flow of the Androscoggin into a canal system, which would eventually power several mill sites (Leamon, 1976). Lewiston was first appreciated as a place of natural power, full of economic potential by those who had established this place as their home.

Bostonian entrepreneurs arrived in Lewiston in the late 1840s and, like those before them, witnessed the economic potential (Hodgkin, 2008). With financial backing from Boston investors, especially Benjamin Bates, the plans established by the Lewiston Water Power Company began (Hodgkin, 2008). Water entered the main canal for the first time in 1852 (Hodgkin, 2008). The first two Bates Mills began production in 1852 and 1854, followed by the Hill Mills in 1854 and eventually the Androscoggin Mills in 1861 (Merrill, 1891). According to the *Lewiston Falls Journal*, by 1857 the Bates Manufacturing Company was producing cotton in larger amounts than the leading mills in Lawrence and Lowell, Massachusetts ("Maine: An Encyclopedia"). Brilliantly, Benjamin Bates predicted a higher demand for cotton during the Civil War ("Maine: An Encyclopedia"). By stockpiling cotton, the Bates Manufacturing Company was able to become one of the leading cotton producers in the country, operating five cotton mills and employing more than 5,000 men and women ("Maine: An Encyclopedia"). The construction of the canals and mills, as well as the mills themselves, created a large demand for employment. Irish and French-Canadian immigrants, in addition to those from across Maine, arrived in Lewiston in hopes of improving their livelihoods ("Maine: An Encyclopedia"). While the overall population in Maine decreased, Lewiston grew by 83% by 1860 and then grew again by 40% by 1870 ("Maine: An Encyclopedia"). By recognizing the potential that Lewiston's

natural landscape offered, economy began to boom, as did population, marking the establishment of Lewiston as a developing industrial power.

Discussion

In this section we will discuss the aspects of our literature review: the history of place, nature's role in industrial development, the importance of museums, and historical narratives, in relation to the development of Lewiston as an industrial city. While the results section focuses on research we found relating to the waterfalls, canals, waterpower, and mills, this section focuses on the role of place and its importance within the context of understanding the history of Lewiston.

The city of Lewiston has changed drastically over past centuries, defining itself by its rich and thriving industrial history. To understand and fully appreciate the growth that has taken place, it is integral to observe the history of place and to keep in mind the aspects that have shaped and defined such growth. In the case of Lewiston, at the most simple level, it is the landscape that has powered development. Historic Lewiston thrived amongst the Industrial Revolution but has since become one of the country's various 'old mill towns'. By maintaining a sense of place and understanding its role within the historical narrative of Lewiston's water systems, one can attribute industrial and economic development to its original source, the natural environment.

In many ways society tends to think that the beginning of the Industrial Revolution was the turning point for the progression of civilization. However, based on our findings and on our literature review discussion of the role of nature in historical and industrial development, one can argue that such ideology surrounding the Industrial Revolution is not entirely accurate. The role

of nature in industrial progression can be explained by nature's services and by natural landscapes. We later discuss these roles in the literature review section, further explaining the role of nature in historical and industrial development. For example, in the agricultural sector, it is clear how nature's services and its landscapes complement the agricultural economy as these factors determine the fertility, productivity, and, in some situations, the market value of the land. Of Lewiston and its natural environment, Ralph Skinner notes:

“If it is asked what are the causes that have made Lewiston grow faster than any other city in Maine during the last thirty years, the answer is found in the magnificent water power with which Nature has endowed it, and its geographical location at the natural center of a large and populous section of the Pine Tree state. The water power of Lewiston is one of the finest to be found in New England” (Skinner, 1969).

In the context of Lewiston, this quote summarizes the role that nature played in urbanizing and developing Lewiston's industrial sector. Figure 1 illustrates the interconnectedness of Lewiston's water systems, whereby the textile mills bordered the Androscoggin River to take advantage of the river's water flow. Moreover, this figure illustrates how the presence of the river allowed for the channeling of water within the city, which catered to the generation of hydroelectric power in each mills' generation stations. In explaining the history of Lewiston, we must acknowledge the role of nature as a foundation for the growth of the city. In realizing the importance of Lewiston's surrounding environment, we created a final deliverable explaining the interconnected relationships between both the city and the environment, and individual components and the water system as a whole.

One of the final deliverables for our project was to create a poster-board attempting to fulfill a variety of different functions. The first and most important function of the poster is located in the center to provide audiences with a better orientation of the Androscoggin River and its relationship to the surrounding canals, mills, and hydropower stations. The diagram also

gives viewers a visual understanding of the close proximity between the river's waterfalls, canals, and mills. Within the diagram are legends indicating what is being represented on the map, as well as a brief description detailing specific dimensions and/or construction dates. The primary function of the diagram is to provide for Museum L/A a larger visual that displays the characteristics of the Lewiston landscape with respect to the Androscoggin and its waterfalls, canals, and mills.

In addition to the centerpiece, the function of the surrounding pictures on the poster aim to provide audiences with greater understanding of the process of waterpower and the development of mills in Lewiston. The historical photographs and their descriptions deliver historic snapshots that collectively capture the different step-by-step processes used to transform Lewiston into an industrial city. The poster shows early photographs of the Androscoggin falls alongside pictures of both canal and mill construction. Meanwhile, the neighboring descriptions complement the images to more accurately tell the detailed story of how all of these components worked together to create a larger water system.

Synthesis

In the course of learning about the historical industrial development in Lewiston, we collected historical information that helped define the history of place using the aspects of historical narrative, the role of museums as educators within communities, and the role of nature in historical and industrial development. In so doing we were able to gain a better understanding of Lewiston's sense of place and how its sense of place has developed from its natural surroundings. This section elaborates on the lessons we learned and concludes why we should care about our findings.

A large part of our methodology included collecting historical data, understanding and interpreting this historical information, and later analyzing it in such a way as to explain Lewiston's industrial development through water. As outsiders to Maine, we questioned whether or not our relationship to Maine as Bates College students was enough to give us the right to write accounts of the history of Lewiston's industrial development. Therefore, we have learned that in regards to reading and narrating historical information, it is important to acknowledge our biases and to recognize the privileges we have of exploring and writing part of Lewiston's deep history.

Our findings on the waterfalls, canals, mills and hydroelectric energy helped us understand the interconnectedness and interdependency of the waterway system as a whole. The process of acquiring this information was limited because a large part of our research found information regarding socio-economic or demographic issues within Lewiston. Based on this experience, we have come to realize how skewed historical information can be in understanding the progression of civilization and the extent to which human relationships are valued, opposed

to the environment in which these human relationships are formed. Due to this, people often become single minded, only focusing on anthropocentric roles as caretakers of the environment.

In the end we ask ourselves, “*Why should we care about the information we found?*”

This question has resonated with us since the beginning of the semester since our project seemed like an anomaly to our fellow peers’ projects. However, in reflection, we have come to realize that this is the reason we need to care. We should care because our project specifically lays down the foundation of Lewiston by exploring its historical and environmental roots. It is the energy from water, industrial development, construction of mills, and immigration and urbanization of the city of Lewiston that currently defines present-day Lewiston. Furthermore, we should care because as Environmental Studies majors, future leaders, and participants of the next generation, we must understand the history of place to further understand how to progress in the future. In addition, our understanding of the history of place has deepened our understanding of nature and of the relationship between humans and the transformation of nature to accommodate the progression of civilization.

Next Steps

Considering the length of this project as being limited to one semester, we have found there to be a lot of information and ideas that should be further researched. First, throughout our research we found little information on the canals and its generation of power specific to Lewiston. For example, we had hoped to learn more about the different power stations that existed on the canal system and how they worked together to form a larger network of water systems. A possible mistake might have been that we focused primarily on literature, finding little; it may be more informative to collaborate with organizations and individuals that had physically worked in the canals and mills. Unfortunately we were unsuccessful in retrieving information from places like Lewiston Public Works and Central Maine Power, both of which were involved in the development of the Lewiston canals. It might be beneficial to try a different form of communication or to find other sources of human knowledge.

Additionally, it would be both interesting and revealing to make a visual comparison of the canals and waterfalls ‘then and now’. This could be done by collecting historical images from places like the Muskie Archives and the Androscoggin Historical Society and then contrasting them by recreating that image today. From this, one could supplement a discussion on the repercussions of the industrial development of Lewiston and how Lewiston has come to be what it is today. Furthermore, our final deliverable, consisting of an informative map and corresponding historical photographs and literature, could be taken to the next level. For example, future groups might create a 3D representation of Lewiston’s canals and water system. This would allow visitors of Museum L/A to truly understand the layout and inner workings of the very systems that formed Lewiston into what it was and what it is today.

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Appendices

Literature Review

The history of place examines both the societal and aesthetic, providing audiences with an understanding of one's surrounding landscape and its development over time. The history of place is especially important as it helps create a link between oneself and one's environmental and historical surroundings. History of place allows the individual to view a landscape as it exists and how it has come to exist, often contributing to the understanding of environmental change and the impacts of human activity on place and its natural resources. In researching the history of place within Lewiston, our group has defined the history of place as a framework incorporating the role of nature in industrial development, the use of museums as an educational tool, and the dependence on historical narrative to present historical findings within the context of specific research projects. Combined, these three factors define the history of place. In this section we will discuss how each factor contributes to the overarching theme of history of place.

The history of place must first be defined in order to understand it within the context of Lewiston. Understanding place within history can help reveal the ways in which the environment and its surroundings have helped shape particular places into what they are today. In her book, *The Power of Place: Urban Landscapes as Public History*, Dolores Hayden discusses place and its importance within urban landscape history. Hayden introduces the multiplicity of the word place: "place is one of the trickiest words in the English language, a suitcase so overfilled one can never shut the lid" (Hayden, 1995). According to Hayden, place can refer to a homestead, location, open space, and even a ranking within a social hierarchy (Hayden, 1995). Hayden combines the aesthetics of place with the societal perceptions of place and states that to truly understand a cultural landscape one must access the two together. She says, "one can't simply

turn to economic geography because the human experience of place is often lost” (Hayden, 1995). Instead, according to Hayden, it is necessary to incorporate both the biological and cultural perceptions of place, in addition to the social and economic analyses to convey an accurate sense of place (Hayden, 1995). Hayden also discusses the interplay between the social and the spatial and its presence within place: “social life structures the territory...and territory shapes social life” (Hayden, 1995). This overlap of social and spatial provides historians with an understanding of social groups and the territories and spaces in which these groups converged, thus creating a broader understanding of the role of history of place within society.

Lowell, Massachusetts, has served as an example to countless mill towns throughout New England. Author Robert Weible discusses Lowell and the importance of history of place within the context of revitalization. Similar to the cities of Lewiston-Auburn, Lowell and its population suffered economically as well as psychologically after the decline of the textile industry in the 1920s (Weible, 1984). With hopes of revitalization, the residents of Lowell constituted an urban planning concept that collaborated with the city's rich industrial history (Weible, 1984). By focusing on the history of Lowell and its unequaled system of canals, the place that was once a textile goliath was to become both a state and national park, establishing the city as a tourist destination and sparking the economy (Weible, 1984). Although the “Lowellians” were primarily focused on the revival of their city, they spoke secondarily of the educational potential of making Lowell a “learning laboratory” (Weible, 1984). By finding a new appreciation for the history of place, “Lowellians” were able to build community pride and raise their city out of the economic and psychological depression that followed the decline of the textile industry.

Throughout our research we have come to understand the history of place as being defined by three factors: the role of nature in industrial development, the use of museums as an

educational tool, and the role of historical narratives as presenting history within the context of specific research goals. We will discuss these elements in detail to further explain the history of place.

Understanding the role of nature in historical and industrial development can help create a larger and more accurate picture of the history of a particular place. Scholars suggest that overlooking the past reduces the context of the present, especially in regards to misinterpretations (Hamburg, Sanford, 1986). Similarly, overlooking the role of natural services and their functions within society often has negative impacts in understanding the ways in which the development of cities depends on environmental surroundings. To gain a better understanding of the role of nature in industrial development, we must analyze nature through two components: nature's services, and nature's landscapes. "Nature's services" refers to the services provided strictly by nature; "nature's landscapes" refers to the physical environment that often determines human productivity and economic activities.

Nature's services can be discussed within the context of determining the types of land humans use. Prior to modern technology, farmers and agriculturalists used trees to determine the productivity of a piece of land. Worster demonstrates this method by analyzing the value of trees on the American frontier (Worster, 1993). Historically, before development of a piece of land, European farmers within the United States used trees to determine soil type and whether or not the soil was nutritious enough to cater to the agriculturally-driven economy (Whitney, 1994). According to Worster, the presence of Oak, Maple, Birch, and Beech trees presented accurate indications of the fertility of soil that chemical tests often cannot. Through a system of classification, soil fertility helped determine the plots of land suitable for farming and agriculture (Worster, 1994).

Additionally, in the past, trees helped determine the market value of plots of land. For example, a piece of land abundant in Sugar Maple, Black Cherry and Sassafras had higher economic value during trade, especially in Kentucky and Pennsylvania (Michaux, 1805). In other cases, land without such trees was not considered valuable (Michaux, 1805). This method of using trees as a determining factor of land value was emphasized in texts by Hubbard (1847) and Heckewelder (1958) in which the monetary value of Oak and White Pine sales dwarfed that of the land itself, and the value of water systems on the Susquehanna River. Through these examples it is clear how the agricultural industry depended on natural capital and on the surrounding environment, such as trees, to help determine soil fertility and production of crops. In essence, the presence of particular trees helped create market value of the surrounding land, which has led to economic prosperity. Similarly, it is important to note how nature's landscapes have helped shape environments into modern-day cities.

The role of nature's landscapes within history of place is important to understand how the physical environment often determines human productivity and economic activities. In particular, water has played an enormous role in writing both environmental and political histories of specific places. Scholars have discussed how the sustainable development of industries can be fostered and engineered by nature's landscapes (Cliggett, Pool, 2008; Krom, Michael D. et al., 2002; Rodriguez, 2008; Worster, 1993). Studying the history of nature's landscapes can help provide a better understanding of the adaptability of communities in relation to natural landscape conditions. Worster reiterates this concept to demonstrate how humans have historically used water to create and accommodate other growing industries. Worster expands upon water and natural landscapes by using the Nile River to exemplify the extent to which humans have used, and continue to use, surrounding landscapes. As Worster describes, the Nile

River is the oldest river that humans have used to their benefit, dating back to 5000 BC (Worster, 1993; Krom, Michael et al., 2002). This river served as a source of fertilization to the green land strips between the river and the desert, providing farmers with water even through drought seasons (Issar, Arie, 1995; Worster, 1993). Egypt's land use exemplifies the ways in which humans have historically used nature's landscapes to human benefit. Despite human capital and advanced technology it is impossible to discount the role that nature's landscapes and surrounding environments have played in the development of agriculture and other industries. Not only is it necessary to recognize the role that nature has played in shaping various industries, so too is it necessary to recognize the role of museums as an educational tool and the ways in which museums benefit their surrounding communities.

While museums are often viewed as aesthetic purposes, the role of museums within communities is also largely educational. In this section we will discuss the role that museums play within a given community and why museums serve as a necessary educational tool. Though museums succeed in fulfilling a variety of functions, we found it necessary to highlight two of the most important responsibilities that museums hold.

In her article, "Usable Knowledge: Learning in Museums", Shari Tishman identifies the most important priority for museums as being a supplemental counterpart to curriculum education (Tishman, 2009). Tishman discusses the ways in which museums both create and foster unique learning environments. As an alternative educational tool, many museums are effective in creating exhibits that blend social, personal, and physical interactions to form a more meaningful experience (Tishman, 2009). Tishman elaborates on the design of museums and the educational focus of exhibits. Taking education into consideration, there is great pressure on museum workers to mindfully decipher what kinds of information are most valuable and which

are worth educating others. This presents a challenge to curators to decide the ways in which they tell the history of a place. Tishman further analyzes how the collaboration of active learning and personal agency that takes place inside museums gives museums the power to be powerful alternatives to traditional classroom education (Tishman, 2009).

Developing from museums' role as an educator is the large impact that museums have on the improvement and development of a community. Museums serve to educate community members about the history, politics, and social fabric of a place. Most museums strive to tell a story within the confines of a particular place. In so doing, museums elevate the appreciation of a place by educating and raising awareness of the place's rich history. In an article "Giving Voice: A Role for Museums in Civic Dialogue", authors Barbara Bacon, Pam Korza, and Patricia Williams illustrate how cultural organizations, such as museums, constantly attempt to realize and satisfy their civic responsibilities. The article discusses the several ways in which museums have the ability to initiate the dialogue of understanding a particular place.

Museums further create a space for local and foreign visitors to immerse themselves in the narratives of a particular place. In efforts to unpack the history of place, museums successfully collect, preserve, and enrich local history. By acknowledging history, museums help improve the quality of a community by becoming an attraction as an educational community component. In addition, "museums can also help expand the debate on important contemporary issues by providing forums for civic dialogue" (Bacon, Korza, Williams, 2001, 1). As an educational tool, museums intentionally create public discussion surrounding social and political issues from both the historical and present-day aspects of a particular place. Dialogue resulting from museum exhibitions helps viewers form opinions on important civic issues and policies, further encouraging the public to "give voice to the critical issues of our time" for the betterment

of the community (Bacon, Korza, Williams, 2001, 1). In many ways museums use historical narrative to present and display historical information to various audiences. As discussed below, historical narrative plays a large part in how viewers access and understand certain histories.

The role of historical narrative in research-based projects is important in understanding and appreciating the larger context and motivations of such projects. The ways in which researchers present their findings can often influence and change other peoples' perceptions of the topic. For example, researchers focusing on a specific aspect of a historical topic may change the way that viewers and audiences later come to understand that topic. Writing a historical narrative raises many questions that must be taken into account, including to whom the historical narrative is being presented, what kinds of information the historical narrative is presenting, and what kinds of information is left out of such a narrative. In determining answers to these questions, it is important to take into account the particulars of a situation. Research projects will demand historical narratives different than those of other research projects.

To understand the role of historical narrative and its importance in research-based projects, researchers must analyze historical narrative in conjunction with scientific and historical data, keeping in mind the context and goals of the given research project. Researchers and historians therefore combine both the historical facts and their larger research objectives to create a historical narrative catered to understanding history within the discourse of their research project. Topolski describes historical narrative as being “a means of transmitting by historians their knowledge of the past, in the sense both of description and interpretation” (Topolski, 1987, 75). Historical narratives therefore have the power to present findings in such a way as to paint an image of a particular history. Of historical narrative Topolski notes, “the establishing of historical facts can take place only through a critical examination of sources, and

an historical narrative as a whole should pretend to a possible adequate presentation of past facts” (Topolski, 1987, 76).

Writing a historical narrative can be demanding, and knowing how to present historical findings to particular audiences can be a challenge in and of itself. Since historical narratives present historical findings within the context of research projects, historical narratives “may have a meaning as a whole over and above the meaning of its parts, its constitutive sentences” (McCullagh, 1987, 30). While historical narratives clearly represent historical findings of a particular topic, historical narratives furthermore determine the ways in which history fits into the context of the given research project. By examining the roles of historical narrative, nature in industrial development, and museums as an educational tool, we hope to create a broader understanding of the history of place.