Adapting to Survive:

A Historic Context for Georgia's Textile Mills Following World War II

Steven Eubanks

May 2011

Made possible by the Elizabeth Lyon Fellowship, with funding and support from the Historic Preservation Division of the Georgia Department of Natural Resources, the Georgia Trust for Historic Preservation, and the Center for Public History at the University of West Georgia

Adapting to Survive

The social impacts of the rise and decline of the textile industry in the Southeastern states has received a fair amount of scholarly attention.[1] Construction techniques and architectural features used in textile mills, which brought about such distinct social change, have also been studied, in efforts to preserve or bring mills back to their original aesthetic appearance. The attempts that textile mills made to stay competitive in the decades following World War II, and how their actions influenced textile mill construction, were aspects of the Southern textile industry that have received far less scholarly attention. The decline of the textile industry is well known, but an understanding of the inner workings of a modern textile mill following World War II goes no further, in many cases, than depictions of mill work seen in the 1979 film *Norma Rae*. The Southern textile industry did not simply wither and die. Many mills that wanted to remain competitive chose to expand and modernize, which dramatically affected the aesthetics of Georgia's textile mills. Georgia experienced the rapid growth and gradual decline in the textile industry along with the rest of the South, and the attempts of many Georgia mills to remain modern, resulted in many mills being radically altered, both in what they made and how they appeared.[2] This study was designed to address the textile industry in Georgia, providing a historical context for the industry following World War II, focusing mainly on how textile mills changed, while attempting to uncover what was added to textile mills and why additions were made.

Methodology and Sources for Study

For this study, broad changes in Georgia textile mills were examined, using existing textile mills as the main resource. Textile mills that displayed significant post-World War II additions were chosen when possible. In order to effectively study mills, site surveys were generally conducted when permission was given to survey the entire interior and exterior of the property, but in some select cases

only the exterior of mills were surveyed. National Register Nominations and Identified Sites files at the Historic Preservation Division in Atlanta, Georgia were another crucial source utilized. Although the focus of these National Register Nominations was the portions of mill complexes fifty years and older, (which in almost every case were pre-World War II construction) it was generally necessary to document the entire site, in order to determine what structures contributed and thus provided valuable information. Various trade journals and textile industry related publications were the final major category of resources examined. Trade publications focused mainly on the overall industrial climate for the textile industry, but there was a considerable amount of information provided about how a textile mill complex should improve and modernize. These three main resources allowed for a thorough examination of post-World War II Georgia textile mill additions. This study attempted to detail how Georgia's textile mills expanded, as well as why mills constructed additions. In some cases this necessitated discussing the reasons for additions, while not addressing construction techniques or materials for that particular addition, due to the information available. Relevant information will was provided about construction techniques and materials when possible.

In order to maintain a manageable and relevant scope, the study did have to purposefully neglect some portions of Georgia's textile industry, and focus on facets of the textile industry that were dominate in Georgia prior to World War II. Thus the focus was mills involved in weaving and spinning, with limited discussion on finishing and dyeing operations. Examining these portions of the industry allowed for an examination of what was being added to mills and why. Although they were assuredly part of the overall textile industry, carpet mills were not discussed in any detail.[3] Their place in the historical narrative will be briefly discussed, but the rise of the carpet industry in Georgia, centered around Dalton in Northwest Georgia, was almost entirely a post-war phenomenon. This paper does not address the apparel industry. The apparel industry, which experienced a massive post-war boom in terms of employment and number of firms, was part of the overall textile complex, but the process of making

apparel is very different, and thus the structures used by apparel manufactures were also different than textile mills. [4]

An International Context for Georgia's Textile Industry

The rise and decline of the textile industry, was not a phenomenon witnessed in only one region or country, but occurred on several occasions in different parts of the world. The textile industry, in many cases, was the first industry to enter a region that was experiencing the initial stages of industrial development, but as an economy reached its peak the textile industry generally falls into decline.[5] This was because labor, which is the chief expense in making textiles, is generally more abundant in underdeveloped countries, and wages are correspondingly low, making these undeveloped areas attractive to textile manufacturers. Additionally, the rise of one country or region's textile industry generally comes at the expense of another region's textile industry, a trait seen long before World War II. In 1900 Britain was the leading textile producer on the globe, producing nearly 70 percent of worldwide textiles, with correspondingly high levels of textile exports.[6] Yet by 1933, Japan, a nation whose industrialization did not begin until the 1870s, was the leading textile exporter in the world.[7] Japan experienced a very early and robust growth in its textile industry, much like the Northeastern United States, which also experienced a nearly constant growth in its textile industry, as the region became industrialized.[8] The dominance of the New England textile industry in the United States, would give way to the dominance of the Southern states by the 1920s. The New England states and the Southern states both turned to textiles early on in their industrial development, but as these regions became industrialized, the textile industry found cheaper production markets overseas in which to operate. By the 1960s the textile industry, in most of the developed world, which includes both the United States and Western Europe, lost an ever-increasing share of worldwide exporting markets to foreign markets, from areas such as Southeast Asia and Latin America.[9] Thus the rise and decline of the textile industry, is not seen only in the Southern states following World War II, but is part of a pattern that was replicated in various places across the globe.[10]

Even though the decline of the textile industry, in terms of employment, may signify that an economy is reaching its peak, this does not mean that Georgia communities once dominated by textiles were happy to see them go. On the contrary, the closing of a textile mill can be traumatic, especially to communities where a single textile mill was the economic basis of that entire community. Howard Upshaw, a machine operator, probably spoke for textile workers across the country and those in Georgia in the mid-2000s as he awaited the inevitable shutdown of his WestPoint Stevens Plant in LaGrange: "You can get up and go to another plant, but others are shutting down."[11] With the demise of textile mills, a way of life disappeared. Georgia's textile mills, in many cases, built the entire towns that housed former agricultural workers who flocked to textile mills for jobs. The mill and its surrounding mill village created a sense of community unknown in modern American industry. Due to the increased use of cars the mill community in many cases declined long before the mill left, which negated the need for worker housing. Even before Columbus's Bibb Mill shut down in 1998, Harry Harden, who spent decades in the mill (in addition to other occupations) looked back at the good days of the mill's mill village, known as Bibb City: "We used to be one big happy family. If you screwed up, you moved out…But now we've got a bunch of outlaws in here."[12] Counties that had a high percentage of workers employed in textiles following World War II, generally experienced larger losses in terms of overall employment.[13] This should not imbue a sense of hopelessness. Former textile communities across Georgia, after the trauma of what probably seemed like a prolonged death of their once most important industry, have in fact been able to reinvent themselves, while the textile mills themselves, as changed as they sometimes were, struggle to find new uses.[14]

The Southern textile industry did not overtake the New England textile industry overnight. In the Southern states, industry as a whole trailed far behind that of the Northern states.[15] In 1860 the New England states could proudly boast 3,857,962 operating spindles, while the Southern states only had 298,551.[16] This outright northern dominance remained intact until the 1870s, at which time New England mills operated 5,858,962 spindles, while the South operated only 327,817.[17] Then in the 1880s

and 1890s the number of mills and spindles calling the Southern states home ticked upwards. Between 1880 and 1890 the number of Southern mills increased from 161 to 239, and the number of operating spindles grew from 542,048 to 1,554,000, with looms growing during the same period from 11,898 to 36,266.[18]

Along with the Southeastern states of Alabama, South Carolina, and North Carolina, Georgia's textile industry experienced a rapid growth around the turn of the twentieth century. The rise of the textile industry in the South, came with a corresponding decline in the once dominate New England textile industry, as many Northern mills chose not to invest in new machines, and kept older machines running longer.[19] The culprit chosen by Northern mill men to explain the demise of the Northern textile industry, was foreign (in this case Southern) competition. A closing mill in Grosvenor Dale, Connecticut that hired approximately 500 people in early 1954, directly blamed Southern competition for the mills demise.[20] Southern mills, in many cases, acquired newer technology, which was far superior to the outdated technology used in New England mills.[21] Georgia, along with the broader South, yearned for textile mills and, Georgia's promoters touted the "High elevation above sea-level, Temperate climate, Proximity to cool mountain resorts, Proximity to ores and building materials, Adequate freight facilities, Location at source of raw cotton supply, Plenty of power, immediately available, Friendly public sentiment, (and) Plenty of native American labor" as reasons to start new textile ventures in the state.[22] The desire to bring industry into the Empire state, with enticements of free land and tax incentives, and a vast pool of labor led to the rise of the textile industry in Georgia. The *Atlanta Constitution* confidently stated in 1896 that "When a town starts a cotton mill…that community is on the road to prosperity."[23] Additionally, Southern workers in some cases worked for half of what a New England textile mill worker would work for.[24] Finally in the mid-1920s, the number of operating spindles in the South surpassed that of the North.[25]

Pre-World War II Textile Mill Construction Methods

Mills built during this rise of the Southern textile industry between the 1890s and the1920s were very similar.[26] In order to understand the importance of post-World War II additions, as well as new construction, it is essential to understand the core mill complex that predominated in Georgia prior to World War II, and the limitations it faced. Although there were several considerations to make when building a textile mill, there were two factors that influenced and limited the way textile mills were constructed. These factors were power and lighting. Swift flowing water was the chief power source for American textile mills, as far back as the 1790s when Samuel Slater designed his first mill in Rhode Island. In order to sufficiently power and run equipment to manufacture textiles with a water driven turbine power source, it was necessary for textile mills to stack floors containing production space. This also limited the locations of mills, because they had to be situated near swiftly flowing water. To run mill machinery with water, after being channeled into a mill race water powered a turbine, which turned a horizontal belt running into the mill. The power from this belt drive was then transferred to other belt drives running in some cases lengthwise through production space, and in other cases running vertically through multiple floors. Vertical drives were used through multiple floors because "the horizontal distance which line shafting could carry power was limited."[27] Once electricity generated by steam plants came into greater use in the 1890s, belt drives were still used to run groups of equipment that had to run continuously, but most importantly mills no longer had to rely on swift flowing water and could be located almost anywhere with access to rail being the chief concern.[28] The inherent need for natural lighting also limited mill construction. Although the width of Georgia's turn-of-the-century textile mills varied, mills were generally limited to a maximum width of sixty to one-hundred feet because beyond that width natural light could not carry into the mill's interior.[29] Windows thus comprised a large portion of the exterior of mills built during the 1890s and 1920s due to the decreased size of internal framing.[30](**Figure 1**)

Figure 1: Photographer facing southeast. Photograph of Atlantic Mill's north façade, Macon, Bibb County, Georgia. Photograph in possession of author, taken February 2, 2011. Mill façade has many of the traits typical in a turn of the century mill including a central tower, continuous rows of arched windows, and load bearing brick walls.

The use of multi-storied narrow mills was not the only similarity between New England and Southern mills. Construction techniques and materials were also generally similar. The interior framing and flooring of textile mills consisted of mostly wood beams and columns, with multiple layers of wood comprising the floors. The interiors of mills had to be able to withstand the vibrations of textile machinery as well as be able to contain fires. Wood remained the choice material to use on the interior of mills, for both flooring and roof support because of the widespread use of so called "slow burning construction".[31] The term "slow burning construction" (in some cases known simply as "mill construction") meant the use of wood in specific placement to allow for wood to char and not burn during a fire, which would maintain the overall integrity and strength of the wood.[32] Wood was also a choice material because it, unlike cast iron, would not flex under the constant vibration of textile mill machinery.[33] The introduction of cast iron and steel into textile mill construction was a slow process, and was only used initially in limited cases.[34]

Mill construction was also generally more cost efficient.[35] The widespread use of iron in any quantity in Georgia's textile mills was largely surpassed by the eventual adoption of steel as the

construction material of choice in new mills and mill additions. Steel has the strength to withstand heavy loads in addition to having a high degree of elasticity when compared to cast or wrought iron.[36] Steel allowed an amazing degree of flexibility for textile mill construction, unknown when wood and load bearing brick walls were the construction material of choice.[37] Steel also allowed for faster on-site construction, especially important because any downtime caused by construction delays could ruin a mill running on small profit margins.[38] The length of uninterrupted steel spans used in textile mills also grew larger in the decades following World War II.[39] Although steel was available for Georgia's textile mills long before it came into widespread use, its spread was very slow, with rapid proliferation diminished by the overabundance of timber, and the widespread use and acceptance of multi-story mills built with slow-burning construction.

Textile mill expansions prior to World War II were generally different from the methods and types of additions used following the war. Most Georgia mills started out with a single-core mill building, and over time additions were added. There were technological limitations to additions. These limitations were especially stringent when entire mills relied on single belt drive or steam power plant to operate. The most common form of expanding Georgia's textile mills prior to World War II involved simply extending the length of the mill. For instance, Bibb Mill in Columbus, Georgia began with a length of approximately 300 feet in 1900, but expanded in length by 200 feet in 1915-1916, and again by 500 feet in 1919-1920.[40] Lengthening a mill allowed a single power source to effectively operate a single mill, but it was not the only factor to consider when a mill expanded before World War II. Light was crucial in textile mills, as the fabric had to be clearly visible to assure proper quality. If mills did not have the room to simply increase length, then a wing, or sometimes multiple wings were added, giving some mills a T- shape, H- shape, or L-shape. Some mill additions simply appear to be two mills placed side by side. Examples of this trend in Georgia abound. Griffin Manufacturing, a subsidiary mill at one time of Griffin's Dundee Mills, and at the time of its closure a part of Thomaston Mills, started out with a single mill building in 1883 that was lengthened in the 1890s.[41](**Figure 2**) When the mill expanded in the early 1900s, it simply added an entirely separate structure, that after numerous additions took on a U-shape,

which was inset within the original mill. This form of snaking mill construction with distinct wings was required because of the width limitations of textile mills prior to the proliferation of artificial lighting and point of use power sources.[42]

Figure 2: Aerial view of Griffin Manufacturing. Griffin, Spalding County, Georgia. Courtesy of Google Earth, Satellite Image Date November 12, 2005. The two distinct structures are clearly visible, with the original 1883 mill comprising the left structure, and the 1900 mill and its additions comprising the U shaped structure to the right in the image.

Georgia's Textile Industry during World War II

Georgia, along with the rest of the Southern textile industry, experienced great success in the 1920s, but the Great Depression brought most construction and expansions to a halt. The plight of Georgia's textile industry changed, with the entire country's economy during World War II as Georgia's mills struggled to produce enough materiel for the war effort. This had consequences, and as a result of the high demand for war related goods and rationing, which limited the possibilities for buying new machinery, Georgia's textile mills found themselves in a difficult position following World War II. The mills which made everything from cotton duck, uniforms, fabric for aircraft tires, asbestos to line ship's pipes, and so on, had struggled to find enough operatives to run the mill equipment.[43] World War II

resulted in high production rates for the entire United States textile industry as production between 1941 and 1945 exceeded prewar levels by an astonishing 50 percent.[44] However, the labor situation in Georgia's mills became so dire that the military was forced to furlough soldiers to "temporarily return to the same type of work they performed before Army induction."[45] Thousands of U.S. Army troops served in Georgia's mills, helping to manufacture textiles.[46] During the war the plight of most mills was similar to that of Upson County's Thomaston Mills. George Hightower, who led the company in its final days, recounted that "Once World War II came, you couldn't get any more equipment. All you could do was wear out what you had…after the War, everything was worn out again."[47] One industry analyst writing in the late 1940s found that during World War II, if textile companies wanted to expand, they "had to acquire mills, rather than construct new ones (or additions) because of the shortage of equipment, government limitations on new construction, and the high cost of new construction."[48] Thus in the 1930s and 1940s, there were relatively few additions added onto Georgia's textile mills, leading to a pent up demand for expansion after the war

The textile industry did not receive government assistance in retooling from a wartime to a peacetime economy.[49] The demand for consumer goods grew rapidly during the immediate postwar years, and opportunities for new export markets seemed unlimited, but the industry needed to invest money into its plants and equipment in order to meet this demand.[50] Regardless of these difficulties it was felt that in Georgia the textile industry was positioned to lead an economic boom and assist in absorbing many returning unemployed soldiers back into Georgia's work force.[51] In Georgia, the textile industry was the state's largest employer in 1948, employing nearly a quarter of all wage earners.[52] The result of these factors, led to a belief within the South's textile industry that the possibilities for profits existed if mills would only invest in improvements and modernizations. One industry analyst reported in 1949 that companies were operating in "a period of extraordinarily high profits."[53] The same textile industry analyst observed in 1949 that "The only real competitors are modern mills. The marginal mills, in layout, and organization, are likely to fall to the wayside..."[54] Mill men who operated older multi-

storied textile mills were probably disheartened to read that "Plants over two stories high will present a most difficult problem of modernization, especially where additions have been made without much thought to process flow." [55] However, there was some hope because "Engineers seem to agree that many of the two-story structures can be modernized economically."[56] The issue that would haunt the textile industry in the decades following World War II was how much to invest, and what to invest in. Investment was necessary as the textile making process and market demands were ever changing for mills following World War II, in Georgia and the South, which had to modernize to stay competitive.

The Textile Making Process

The process for manufacturing textiles saw a general improvement in the decades following World War II.[57] Even with improvements and new technology, the process of making textiles involved three main processes, and the understanding of these steps was essential to an understanding of how textile mills were designed and actually functioned, and also explained why some additions were common.[58] Additionally, the advancement and improvements of certain processes determined what sections were added onto textile mills, as some newer technologies grew in size. The textile-making process experienced a steady advancement in technology, because it removed some processes and reduced the amount of labor required in mills.[59]

The first major step in textile production involved the cleaning and paralleling of the raw product.[60] Opening, generally occurred in a separate and distinct space, away from the rest of the production area, in most cases in a specific warehouse bay. During the opening process multiple bales of cotton were combined to produce a uniform product, in a process known as blending. The cotton was then blown through tubes into a picking room.[61] Although the cotton was already ginned to remove most of the seeds and large pieces of trash, the cotton had to be cleaned again by picking machines, attempting to leave only the raw fiber.[62] The cotton, which came from picking in a thick lap, was then fed into

carding machines that paralleled the fibers into a sliver. Following formation into a sliver, the sliver was combed and drawn out, which involves combining multiple slivers into one, and then drawing it out into a single sliver, and then placing it in a sliver can in preparation for spinning. The process between carding and spinning, underwent a number of significant changes in the 1960s and 1970s as processes and equipment were introduced that combined the carding and combing process, allowing the product to come off the card already in a single sliver ready to be drawn and then spun.[63] Once the cotton was prepared in sliver cans it was ready for the second main process, yarn formation.

The opening, picking, and carding processes generally required separate, enclosed spaces. The second major step in the textile process, yarn formation, was generally done in one large open area. The sliver, which had the consistency of a thick and loosely bound piece of yarn, went through various stages which pulled and drew the yarn into a single compact piece of fiber. The sliver was first placed on a drawing frame that converted a number of slivers into one tightly bound sliver.(**Figure 3**) This tightly bound sliver was transferred to a slubber, where it was drawn out and placed on bobbins, which were then placed on a roving frame.(**Figure 4**) On the roving frame the yarn was finally beginning to take shape, as it is still being drawn out and twisted on a roving bobbin.(**Figure 5**) The roving bobbins were then placed on a final spinning frame, where they were given their final drawing out and twisting.(**Figure 6**) The multi-stage spinning process between the 1960s and 1980s underwent a number of changes that reduced the amount of labor needed, as well as increased the productive capability of mills. Processes were combined into ever more efficient units, neglecting the need to run yarn through successive drawing out and twisting processes. Modern mills are now able to transfer sliver cans directly from the carding and drawing process to a single spinning process, known as open-end spinning.(**Figure 7**) Open-end spinning, developed in Czechoslovakia in 1963, was slowly adopted in the United States.[64] Open-end spinning is best used to produce coarser yarns, used in products like denim fabric, and thus many specialty or finer yarns, are still drawn out through successive processes, but even older spinning methods like ring spinning, today negate or combine processes, making the overall process far more efficient. The

possibility of spinning equipment producing far more product, while adding no further floor space was one of the chief reasons that additions for spinning were very rarely added onto textile mills following World War II. In essence, improved technology lead to not only increased production on a single machine, but also combined processes in fewer machines freeing up production space for ever more productive equipment.

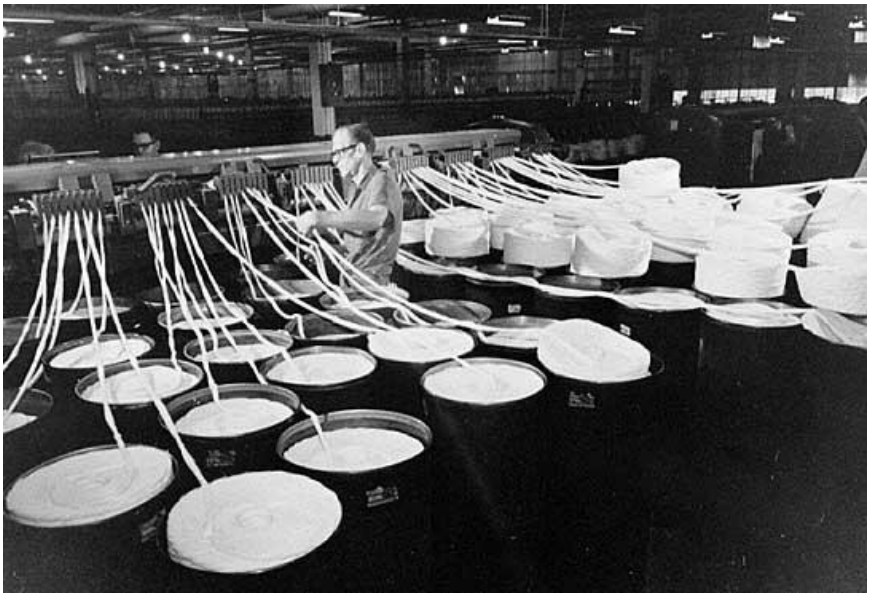

Figure 3: Undated Photograph of Goodyear Tire and Rubber Company, Cedartown, Polk County, Georgia, plk140-84, Photograph courtesy of Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State. Multiple slivers are drawn-in to make a single tightly compacted sliver.

Figure 4: Undated Photograph of Goodyear Tire and Rubber Company, Cedartown, Polk County, Georgia, plk141-84, Photograph courtesy of Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State. Slubbers in the foreground are drawing out a single sliver onto bobbins.

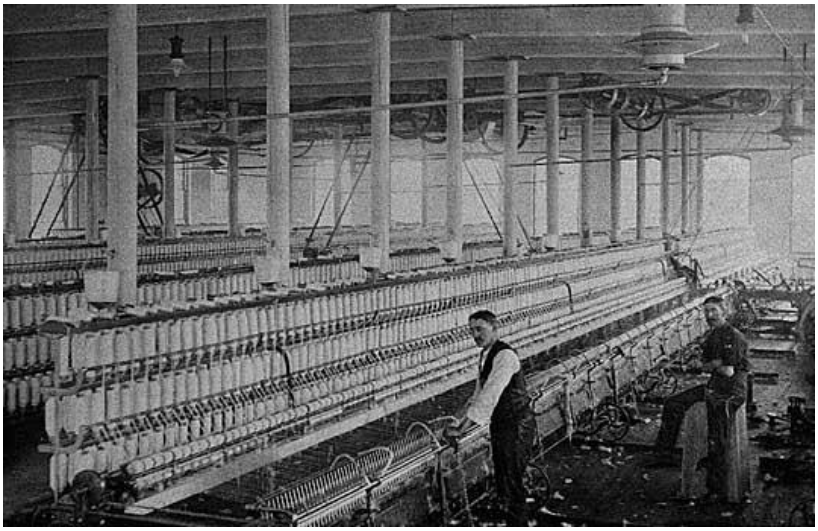

Figure 5: Circa. 1920s Photograph of machines (roving frame) inside a cotton mill, Lawrenceville, Gwinnett County, Georgia, gwn 241, Roving draws the fiber out further. Photograph courtesy of Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State.

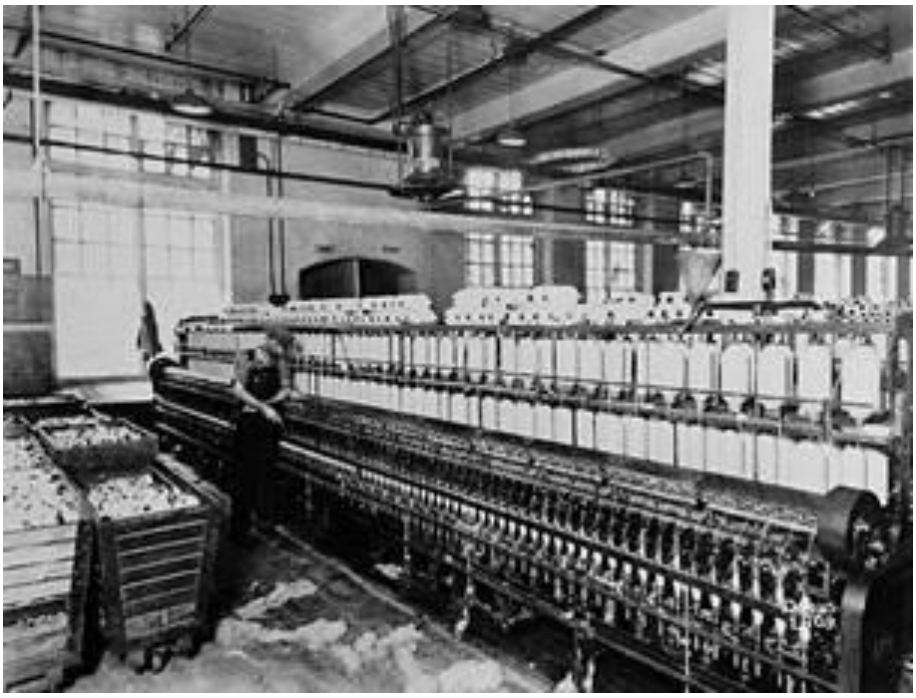

Figure 6: Circa 1930s Photograph of spinning frame at unidentified LaGrange Mill. LaGrange, Troup County, Georgia, trp251. Photograph courtesy of Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State. The spinning frame completes the process of forming the fiber.

Figure 7: Photograph of open-end spinning frames. Mount Vernon Mills, Trion, Chattooga County, Georgia. Photograph in possession of author taken January 17, 2010. In addition to other processes not shown, open end spinning combines the process shown in Figures 4-6. Open end spinning works best with coarser yarn , and many finer yarns still move through the multiple stages similar to those shown above.

The third and final step of the textile process was the making of the fabric. Following the spinning process, the yarn was held on a number of small bobbins, which were combined to make one large spool of continuous yarn. The yarn was then be transferred from spools onto a beam, in a process known as warping. Hundreds of bobbins were placed parallel on a single roll, known as a warper beam.(**Figure 8**) Following warping, the product moved to slashing where a number of warper beams, were combined, and a protective coating was added to strengthen the fabric.[65] The slasher beam was then taken to be beamed (or rebeamed as it was sometimes known) where the fibers were placed in parallel lines, assuring that they were parallel when weaving occurs. The beam was then taken and placed on a loom, where the material was woven into a continuous fabric.(**Figure 9**) The stages of the fabric making process took place in very distinct spaces, with warping, slashing, and weaving generally all having their own spaces. Slashing, because it was a wet process required a separate subdivided unit in which the slashing operation could occur. There is an overall increase in productive capability in the decades following World War II, with the loom being an excellent example. The shuttle, which had long been the device that carried the weft thread back and forth across the width of the fabric, was removed to allow for a higher overall loom speed.[66] Looms also increased in size necessitating that they occupy newer spaces in a mill, spaces that had more widely spaced (in most cases steel) columns.[67] The amount of product that a loom could produce also grew dramatically following the advancement of loom technology and loom size. For example, the average loom in 1974 could produce about 8.3 square yards or fabric per hour, but by 1994 the average loom produced nearly 29.5 square yards of fabric per hour.[68]

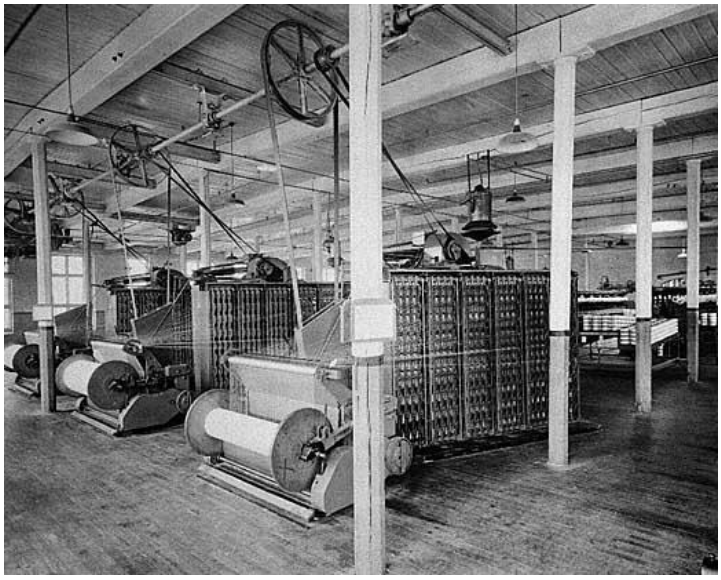

Figure 8: Circa 1920s Photograph of the warping room at Boylston Crown Mills, Dalton, Whitfield County, Georgia, wtf258 Photograph courtesy of Georgia, Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State.

Figure 9: Photograph of modern loom. Mount Vernon Mills, Trion, Chattooga County, Georgia. Photograph in possession of author taken January 17, 2011.

The most common additions added onto Georgia's textile mills, were additions meant to house additional weaving space. Loom placement was optimal in areas with large expanses of space uninterrupted by columns, that allowed rows of looms to be placed side by side. Spinning equipment, on the other hand occupied long lanes, making it generally acceptable to house in older portions of mills. Wet processes were also common additions. Wet processes, which include slashing, bleaching, or dying, generally occupied separate spaces, and when additional space was required a completely new area would generally be constructed. The overall trend throughout the decades following World War II, was increased productivity for all portions of the textile mill process, requiring less overall employment, in new spaces when possible.[69]

Transitional Post-World War II Textile Mill Additions

In order to facilitate increased production or incorporate new processes, many textile mills chose to expand and increase the size of their structure. These additions (about which the bulk of this paper discusses) would dramatically alter the look of Georgia's mills. There is however, a transitional period following World War II during which additions to Georgia's textile mills carried many of the similarities of a traditional turn-of-the-century mill. LaGrange's Dixie Mill built in 1883 experienced a series of expansions on its north facade in the 1940s.[70](**Figure 10**) These additions are now largely obstructed by air-conditioning units, installed later, but their characteristics are much like the original mill, with broad open window bays, allowed because of smaller internal wood framing.[71] The only difference between the construction of these additions was the use of steel interior columns and roof beams.[72] The two story additions had load bearing brick walls, like the original mill.[73] The additions at Dixie Mills were added to increase production space, as they are open to the rest of the mill.[74] A similar type of addition was added onto Monroe Cotton Mills in Monroe, Georgia.(**Figure 11**) Monroe Mills' addition was similar in that it uses the same construction techniques as the main mill, which was built in 1895, and expanded

upon several times, including a significant widening of the mill sometime between 1925-1945, except that the addition has steel columns and roof beams.[75] The 1949 addition had arched windows and load bearing brick walls, which were typical construction techniques for turn-of-the-century textile mills. At Monroe Mills, this new space was used for picking, with cotton blown directly to this area.[76] This addition simply filled in vacant space between the length of the main mill and a weave shed on the east facade. Building an addition, relived the space that the picking operation originally took up in the original mill.

Figure 10: Photographer facing southeast, Photograph of Dixie Mill's north façade, LaGrange, Troup County, Georgia, Photograph in possession of author, taken February 3, 2011. Mill façade and most of the 1940s additions are obstructed by air cleaning systems, company offices, and occupational health offices.

Figure 11: Photographer facing southwest, Photograph of Monroe Mill's 1949 addition. Monroe, Walton County, Georgia, Photograph in possession of author, taken January 18,2011. The addition was built to fill in space between the main mill and areas were weaving was done. The addition is multi storied, with window bays much like the original mill. The addition has been covered with an elevator shaft, toilet tower, and an air cleaning unit.

Although the trend in textile mill construction following World War II was away from the heavy use of windows, improved construction techniques actually allowed for walls at textile mills be made of broad bays of windows. For example, a 1945 two-story weave mill was added onto Columbus's Swift Mill in 1945, which because of internal steel framing, utilized vast bays of windows which occupied most of the exterior wall.[77](**Figure 12**) Another example of the transitional period in mill additions is seen in Tallapoosa's Tallapoosa Cotton Mill (now known as Venus Thread Mill). The mill was built in 1907-1908, and had many of the key features of a turn-of-the-century textile mill including bays of arched windows and multi-story construction.[78] The mill had tough times during the Great Depression, staying open only a day or two a week and finally closed in 1938.[79] In 1944 the mill was purchased by The American Thread Company and reopened. In 1948 the mill expanded with a 150,000 square foot L-shaped addition that encased two sides of the mill. The addition added space for 25,000 additional spindles and related spinning equipment, as the mill only spun and never wove fabric.[80] The addition was multi-storied to match the original mill and had broad expansive window bays, made possible by interior steel framing. (**Figure 13**) Even though it was possible to allow for greater portions of mill walls to be comprised of windows, interior lighting soon totally negated the need for large window bays, even though minimal steel framing allowed it. The use of multi-storied mill additions, with similar aesthetic qualities, or the use of broad window bays, displayed the inherent conservative nature of most textile mills, as well as the considerable time period it took for newer construction techniques, such as all windowless construction, to proliferate within Georgia's textile industry.

Figure 12: Photographer facing east, Photograph of Swift Mill's weave shed added in 1945. Columbus, Muscogee County, Georgia, Photograph in possession of author, taken January 27, 2011. This addition, built with a steel frame, is similar to many International Style buildings, and even though it is multi storied, it looks very different from the older portions of Swift Mill.

Figure 13: Photographer facing south, Photograph of Tallapoosa Cotton Mill 1948 Addition. Tallapoosa, Haralson County, Georgia, Photograph in possession of author, taken April 12, 2011. The windows in the addition have been bricked in.

The Effect of Air-Conditioning on Textile Mills

The building of additions for additional production space was only one facet of the changes that mills experienced following World War II. The widespread use of industrial air-conditioning and air cleaning systems became a key factor in mill modernization. Air-conditioning was not a post-World War II development in textile mills, as the process of conditioning the air "began with the effort to add

moisture to dry factory environments" in the early twentieth century.[81] Before systems to regulate the environment within a mill became common, Gail Cooper, a student of the history of air-conditioning in America, finds that most mills could only regulate whether there was more or less humidity.[82] This imperfect system involved simply opening or closing windows to allow excess humidity out or more humidity in. Not only was this system inefficient because of the vast changes in humidity, workers often toiled in oppressive conditions. Early air-conditioning systems sought simply to add or regulate moisture, because proper moisture content allowed for increased production rates. Systems to add moisture were eventually melded with ventilation and equipment to lower the internal temperatures of a textile mill, making a mill more bearable for the workers as well as more productive and profitable.[83] The process of developing systems to both condition, by regulating moisture and temperature, as well as removing impurities was ever evolving. The first textile mill built from the ground up with air cleaning and cooling systems was not built until 1944, even though the process of developing internal air conditioning began in the early 1900s.[84] Even though human comfort increased as a byproduct of air conditioning and cleaning systems, production increased as well. Following the Occupational Safety and Health Administration's (OSHA) requirements that cotton dust be kept down to certain levels in mills, production increased even more. Besides improved production and human comfort, the removal of cotton dust is one of the key factors influencing the addition of air coolers and cleaners on textile mills. Cotton dust levels, as a result of OSHA's approval in 1978 of the so-called "cotton dust standards," were heavily regulated.[85] Even though this standard was put in place and upheld by the United States Supreme Court in the late 1970s, additions to house dust-removal systems were installed, in many cases before these criteria were made law. Interestingly, one of the byproducts of the cotton dust standard was an overall increase in production speeds.[86]

These air-conditioning systems affected the look of Georgia's textile mills. Although air-conditioning systems could and were installed within the mill's production space, or on the roofs of mills, the most common and widespread systems to install industrial air-conditioning involved constructing

external units designed to hold conditioning systems.[87] For example, in 1970, air-conditioning was installed at Dunson Mill in LaGrange.[88](**Figure 14**) Dunson Mill, built in 1910, had many of the distinctive features of a turn-of-the-century textile mill. The mill was multi-storied, extremely narrow, with numerous windows in long continuous bays to allow natural light to flood the production space. Interior artificial lighting made windows unnecessary, and at Dunson Mill and so many other mills, the windows were bricked up to create a sealed production space, which allowed for nearly complete control of the environment in the factory space.[89] Dunson's facade was altered not only by the bricking-in of the windows, but by the construction of the aforementioned towers, which housed air-conditioning equipment.[90] At Dunson six of these air-conditioning towers were added directly onto the façade of the main mill. Many of the air conditioning towers were simply built on concrete pads with a brick veneer. There was no standard one-size-fits-all method, to these air-conditioning towers in Georgia's mills. One reason for this is that the air-conditioning systems were quite complex, utilizing equipment to move the air, chillers to cool the air, and dust houses to collect impurities removed from the air. Habersham Mills in Habersham County also had a system of air-conditioning towers like Dunson Mills.[91](**Figure 15**) These towers were also built directly onto the main mill. Their construction techniques were much like Dunson's in that they were set on concrete slabs with concrete-block walls.[92] These air cooling and cleaning towers, can be seen as the result of years of studying how to control and regulate the air within textile mills. The use of these air-conditioning towers was by no means limited to a few select mills, because the possibility for increased production and the burden of government regulations required textile mills to control and limit cotton dust, meant that most mills added air-conditioning equipment.

Figure 14: Photograph of Dunson Mill in LaGrange, Georgia. Photographer facing north, LaGrange, Troup County, Georgia, Photograph in possession of author taken November 16, 2010. Photograph of air washing and cooling tower. Cooling tower is in left center of photograph, to right of the conditioning tower is the original mill façade with bricked in windows.

Figure 15: Photograph of Habersham Mills in Habersham County, Georgia. Photographer facing east, Photograph in possession of author taken December 9, 2010. Photograph of red brick addition added to house air washing and cooling system. To the left of the red brick addition, is the main mill which has been covered with corrugated metal.

Mergers and Integration of Processes

The textile industry following World War II in Georgia, and the broader South, included a large number of firms, who generally specialized in a small portion of the overall textile making process. For

instance, many of Georgia's mills would both spin and weave cotton or manmade fibers into fabric, but few finished their product in-house. This system meant that the largest textile companies controlled very little market share, but is also meant that there was a great deal of room for integration. Between 1940 and 1946 one half of all operating spindles in the country changed hands as part of vertical integrations.[93] Solomon Barkin, director of research for the Textile Workers of America-CIO, believed that a byproduct of companies integrating in the 1940s was the "enlarge(ment of) the size of mills. Small mills were enlarged into constantly bigger ones…The average size of mills continued to grow, particularly in Georgia…"[94] Mergers allowed companies to create larger economies-of-scale, and with such a large number of textile mills, the industry as a whole was ripe for mergers.[95] Mergers and acquisitions could affect a textile mill, as Barkin believed, especially if a purchasing firm chose to invest in a mill. The decision to integrate a single mill, and increase the number of processes conducted within a single mill, could most certainly affect how a mill looked. Chicopee Mills, built in 1926, near Gainesville, Georgia, underwent a number of post-war expansions, with additions added for spinning and weaving. Many of the additions however, allowed the mill to finish more of its own product on site.[96] The mill added a finishing plant in 1953 and a lumnite plant in 1966. Chicopee did not report a massive increase in looms or spindles throughout the period, indicating that these additions made the mill more productive by allowing more processes onsite.[97] At Chicopee these additional structures are not constructed directly on the main mill, but arranged in various locations around the mill complex.

Columbus's Muscogee Manufacturing Company, whose oldest structure dated to 1866, grew to be much more than just a mill that spun and wove fabric. Over time it gained additional buildings and structures until it had a total of seven distinct buildings, with the final major addition (Mill #7) added in 1950.[98] Mill #7 was actually used for bleaching, as one of the final processes required before the product was finished. This final mill addition incorporated many of the stylistic features of post-World War II mill construction including, windowless construction, concrete floors, and concrete block walls with exterior brick veneer.[99] Most significantly this addition of bleaching space, according to a Historic

American Engineering Record survey conducted in 1977, made the Muscogee Manufacturing company the only mill in Columbus that took "raw cotton and fashion(ed) a finished product…"[100] The additions at Muscogee Manufacturing Company although allowing it to produce more material, made the mill a self-contained system that left fewer steps between when the product left the mill and the final consumer.

Muscogee was not alone in constructing additions that allowed it to integrate processes within a single mill. Superba Mills, in Hawkinsville, Georgia constructed in 1901, had the typical features of a turn-of- the-century mill, with a central tower, tall arched windows, and multi-storied construction. This main mill was encased in a number of additions in the 1950s following purchase by Alabama-based Opelika Manufacturing Company.[101](**Figure 16**) These additions were added to allow Hawkinsville to bleach and finish its own goods. One addition was added in 1963 and housed space for cutting, sewing, material staging, a cafeteria, and a chemistry lab, and another addition added in 1973 housed dying, bleaching and drying.[102] These additions were similar in that they were steel framed, windowless, with a brick-veneer exterior, and provided spaces to conduct finishing operations at the mill. With wet operations, like bleaching or dying, it was necessary to encase the entire production space, thus making openings, such as windows, a determinant to the process. Hawkinsville's mill also had another common post-World War II addition added in 1966 to house slashing on the south side of the main mill. Slashing, is a wet process, that combines multiple warper beams and adds a chemical compound to the fibers. Wet processes generally required separate spaces, and thus, if additional slashing was needed, it required an entirely separate space.[103] These additions, even though they encase the mill, provided an opportunity for Hawkinsville's mill to integrate its processes within a single space, making the mill more competitive. The nature of the additions, because they directly surrounded and encased the mill, illustrated that additions built in a snaking or narrow fashion were no longer necessary. Additions that encased the main mill complex were economical, and above all functional.

Figure 16: Aerial view of Superba Mill in Hawkinsville, Pulaski County, Georgia. Courtesy of Google Earth, Satellite Image Date Feburary1, 2007. The original mill is seen in the right of the aerial view encased in additions.

This need to diversify operations also heavily influenced what parts of mills expanded in the decades following World War II. In 1951 Fulton Bag and Cotton Mills, located near Atlanta, completed the construction of a bleachery, which allowed for additional bleaching capacity.[104] In the 1960s the mill also heavily invested in printing equipment, which required additional production spaces. This printing addition, added in the 1960s, was part of an expansion program that was supposed to allow for increased finishing capacity and allow the mill to be more versatile.[105] The aforementioned Swift Mill constructed a single-storied indigo dye house in 1951.[106](**Figure 17**) The dye house was set off from the main mill complex, but illustrated the necessity of having separate, distinct spaces for the dyeing process. Bleaching and dyeing are wet processes, and thus required distinct structures that were separate from spinning and weaving areas of a textile mill, but most importantly were common additions added to Georgia' s mills in the decades after World War II.

Figure 17: Photograph of dye house at Swift Mill Columbus, Muscogee County, Georgia, Photographer facing west, Photograph in possession of author taken January 27, 2011. Dye house was some distance from the main mill, as most dye houses required distinct spaces because dying is a wet process. The structure is one story but has a raised area to accommodate the taller dying equipment.

Manmade Fibers in Georgia's Mills

A key trend in the textile industry following World War II, was the widespread use of manmade fibers. Although manmade fibers were used prior to World War II, their use truly proliferated in the decades following the war.[107] If a textile mill wanted to introduce rayon or other manmade fibers into its production process, and continue to use cotton, separate spaces and equipment were required for each fiber to allow for optimal production. It was possible for a cotton mill to switch to rayon, but in order to utilize both cotton and synthetics effectively it generally required distinct buildings or spaces within a single mill.[108] Synthetic fibers were in use in the early 1900s, but not in great quantity until the 1950s.[109] It was however, possible for mills to simply incorporate synthetics into the process without building additions, although mills in many cases chose to add distinct spaces for manmade fiber production.[110] Cotton did maintain its hold on the textile market in the decades following World War II, accounting for 86 percent of the textile production.[111] By 1962 cotton only maintained about 65 percent of the market, with synthetics making up the difference.[112] The vast majority of manmade fiber mills, or those that

made the fiber to ship to mills throughout the 1950s were located in the South, and the synthetic fiber industry expanded in the South to meet the demand of synthetic mills.[113]

In some cases firms chose to combine the ability to produce multiple types of fiber within a single textile mill. Synthetic or manmade fibers are processed best when the environment in which they are manufactured allows for consistent control of the internal environment. ATCO Mills (ATCO was an acronym for the American Textile Company), built in 1904, produced tire fabric for Goodyear tires, and was a typical multi-storied textile mill with continuous window bays.[114] In 1952 a large one-story addition was built on the southern end of the main mill.[115](**Figure 18**) This addition embodied the radical changes which had occurred in Georgia's textile mill architecture, because the addition was a very wide one-storied windowless addition built directly onto the southern face of the main mill. This rayon mill allowed ATCO to utilize not just cotton, but also manmade fibers as part of its final product.[116] The necessity to produce synthetic and natural fibers within the same complex lead to the addition of this rayon mill at ATCO's mill, but other mills added additions to allow for the production of manmade and natural fibers. Macon's Willingham Cotton Mills Chairman of the Board reported that its reason behind a large expansion at the mill was due to the fact that "We face a steadily growing market in synthetics…the planned expansion…will enable us to initiate the transition from cotton to synthetic production."[117] In the case of Willingham Cotton Mills, and many others in Georgia, the ability to utilize more synthetic materials required added adding additional space.

Figure 18: Aerial view of ATCO Mills. Cartersville, Bartow County, Georgia, Courtesy of Google Earth, Satellite Image Date August 4, 2006. The long narrow structure is the original mill, and the wide structure at the bottom of the aerial view is the rayon mill.

Post-World War II One-Storied Additions

Following World War II, textile mills often expanded with one-storied additions. When Thomaston's Martha Mills chose to expand in the late 1960s, it chose not to expand with a multi-storied addition, but chose to build a one-story addition to the south of the main mill.[118](**Figure 19**) This one - storied addition was emblematic of many of the new construction techniques that became common in textile mills in the 1950s and 1960s. The addition had the typical steel columns and steel beams, with non-load bearing interior concrete-block walls, and an exterior brick veneer. The advantages of this addition to the original mill were clear. The main mill was built in 1926 with expansions added onto the west and east flanks, with cast-iron columns, that compromised a great deal of the interior space. One-

storied additions, like the addition at Martha Mills, were generally used for additional weave space because as looms improved, their size grew, making interrupted space essential. The use of one-story weave sheds was not a post-war occurrence. Weave sheds had traditionally been one-story to allow for easy product flow. The weaving operation required a great deal of natural light, usually allowed in through roof monitors or sawtooth roofs, thus necessitating one story weave mills. Martha Mills' weave mill addition, was detached slightly from the main mill, and connected by covered breezeways with closeable blast-proof fire doors, but did not have the once typical sawtooth roof or roof monitor.

Figure 19: Photographer facing north, Photograph of weave mill and warehouse constructed in 1969. Thomaston, Upson County, Georgia, Photograph in possession of author taken November 11, 2010. Exterior of main three-story mill is seen rising behind the one-story utilitarian mill.

Adding a one-story addition was also far more flexible than adding a multi-story addition. Willingham Cotton Mills in Macon added a one-story addition to the east side of its main mill in 1967.[119](**Figure 20**) The addition which reportedly made Willingham "the most modern (mill) of its kind," allowed space for automatic looms, and most importantly had space for electrically operated cranes to transport materials.[120] Overhead cranes and systems to mechanically convey products through a mill dramatically reduced labor cost, by eliminating what one North Carolina textile manager called the

"…pushing , pulling types of jobs."[121] Cranes and gurneys were restricted by column spacing and the addition of ductwork in older mills, a problem that could be eliminated by building an addition. Reducing handling costs through automation required the alteration of existing structures, or simply the construction of new mill space. This type of one storied, windowless addition added directly onto the mill face, was not uncommon with Georgia's mills. Greensboro's Mary Leila Cotton Mill, originally built in 1900, had a similar one-storied addition added in the early 1960s.[122](**Figure 21**)

Figure 20: Photographer facing west, Photograph of one-storied addition at Macon's Willingham Cotton Mills. Macon, Bibb County, Georgia, Photograph in possession of author taken February 1, 2011.

Figure 21: Photographer facing east, Photograph of one-storied weave mill addition at Greensboro's Mary Leila Cotton Mills. Greensboro, Greene County, Georgia, Photograph in possession of author taken February 8, 2011 .

The use of reinforced concrete, although far from common in Georgia's textile mills, is seen in several mills. Hogansville's Stark Mill, built by Lockwood Greene Engineers, one of the most well-known textile mill engineering firms, in 1923-1924, manufactured tire fabric.[123] U. S. Rubber acquired Stark Mill in 1931 and the neighboring Reid Mill during World War II, when the need for tire fabric was high. [124] U. S. Rubber demolished Reid Mill in the 1960s, and in order "to replace the weaving facilities lost when the old Hogansville Mill (Reid Mill) was demolished…" built a large single story reinforced concrete addition on the northern face of the mill.[125](**Figure 22**) Reinforced concrete allowed for large expanses of interrupted spaces, allowing for optimal placement of machinery. Stark Mill's addition is entirely windowless because of the advancements of interior lighting. The use of reinforced concrete for additions is not relegated to Stark Mills, as LaGrange's Elm City Mills also has large reinforced-concrete additions.[126] Reinforced concrete, because it gave the ability to create an entirely enclosed environment, also provided an excellent choice of material to use with wet processes, and for example Fulton Bag and Cotton Mill's last major addition was a large reinforced concrete structure built in 1951.[127] However, reinforced concrete is not seen in a large number of mill additions, even though it is part of the broader trend of moving away from the use of load-bearing brick walls and interior wood framing.[128]

Figure 22: Image above of Stark Mill, Hogansville, Troup County, Georgia, from Lisa Pfueller Davidson. *Stark Mill (WesTek Hogansville Plant)*. Historic American Engineering Record, HAER No. GA-117. The windowless reinforced concrete addition can be seen in the left of the photograph.

Post-World War II Multi-Storied Additions

Regardless of the superior nature and ability to construct one-storied addition, this was not always possible. Multi-storied additions were used following World War II but the nature of multi-storied additions were different from the multi storied lengthening of mills that had been used for half-a-century preceding World War II. Since windows were no longer necessary, additions could be added directly onto the width of a textile mill. Commerce's Harmony Grove Mills is an excellent example. The mill, built in 1893 had the typical features of a turn-of-the-century textile mill including narrow construction, long bays of tall arched windows, roof monitors, and multi-storied construction. When the mill expanded after World War II, however it removed its exterior wall on the east side, and expanded the width of the mill, with the new two-story addition simply having a solid brick exterior.[129](**Figure 23-24**) The load-bearing brick columns were largely removed to allow the addition to be entirely open to the main mill. The addition simply gave more square footage to house production equipment. It was indicative of the

changes in mill construction that the addition was able to be entirely windowless, carrying no similar stylistic traits of the original turn-of-the-century textile mill. Columbus's Swift Mill also chose to expand in 1957 with a multi-storied addition added to the south end of its Mill #2.[130](**Figure 25**) This addition was steel framed, and contained only marginal slits for windows on the south face. The structure was meant to house spinning and slashing equipment and provide for better production flow.[131] Adding a one-story addition would probably not have allowed for additional space for both spinning and slashing, since each requires distinct sections of a mill, at different points in the process. With one-storied additions, mills could target sections to expand, but in some cases expansions covered varied processes, requiring multiple additions.

Figure 23: Image above of circa 1949 Harmony Grove Mill, Commerce, Jackson County Georgia, from Frary Elrod. *Historical Notes on Jackson County, Georgia*. Jefferson, GA: Author, 1967, 77. Addition (seen in **Figure 24**) was added directly onto length of mill seen above.

Figure 24: Photographer facing west, Photograph of multi storied windowless addition at Commerce's Harmony Grove Cotton Mills. Commerce, Jackson County Georgia, Photograph in possession of author taken February 8, 2011.

Figure 25: Photographer facing east, Photograph of multi storied addition at Columbus's Swift Mills. Columbus, Muscogee County, Georgia, Photograph in possession of author taken January 27, 2011.

Some mills chose to expand using a variety of additions. For example Remerton, Georgia's Strickland Cotton Mill, when first constructed in 1899 was a typical multi-storied turn-of-the-century textile mill.[132] In 1947-1948 a multi-storied addition was added that was similar to the main mill, except that it had interior steel framing, as opposed to wood framing in the original mill.[133] This addition was a

relatively standard addition in that it simply expanded the mill length. A subsequent two-story addition was added in 1960 that covered portions of the 1899 and 1947-1948 mill's east façade. In 1966 a one-storied addition was added that connected the 1960 addition and the original mill. This one-story addition was much like the two-storied addition in that they were both windowless. Flexibility in mill additions was key, and steel-framed windowless construction allowed mills to add additions and expansions wherever they were most needed, using additions of various heights, if needed.

Textile mills did not generally expand in one single campaign, but underwent numerous building campaigns adding additional space as needed. With the ability to have power at the point of use, the ability and necessity to entirely enclose space, and the widespread use of steel columns and non-load-bearing walls, textile mills could expand as needed. Above all else additions were meant to be functional, and in many cases additional equipment was housed in vernacular structures following World War II. Trion's Mount Vernon Mills underwent numerous building campaigns, which have completely encased the original 1870s mill.[134](**Figure 26**) The core mill continues to operate like a mill built eighty years ago, with the process moving from the highest to the lowest floors, but when particular areas were targeted for expansion, additions were added wherever needed.[135] At Trion, cotton is blown from opening rooms to the third floor of the main mill where it is carded. The carded material, which has been converted into cotton slivers, is taken to the second floor where it is spun. It then moves back to the third floor where it is warped. Following warping, a warp beam is taken to slashing, where it is combined with other warp beams and then dyed. The beam is then prepared for weaving by beaming. The material is then ready to be woven, which occurs on the first floor. Following weaving the product makes it to the finishing plant, in preparation to be shipped to apparel manufacturers. There have been numerous post-World War II additions added, to allow for additional production areas and specialized space. The majority of the additions have the typical interior steel beam and column framing, and non load bearing concrete block walls with exterior brick veneer. The additions were built on the mill wherever they were needed and were vernacular with functionality being the most important facet of the mill's additions.

This allows for additional weaving, slashing, dying or finishing space were needed at the mill. The only constraint on the mill expansion were the load-bearing brick columns which had to remain, but the non-load-bearing sections were removed to allow full integration of the additions into the mill production space.

Figure 26: Mount Vernon Mills, Trion, Georgia. Photographer facing west. Trion, Chattooga County, Georgia, Photograph in possession of author taken January 17, 2011. At the far left of the photograph, the northern facade of the original mill is visible. The addition connects the main mill with a white dye house on the right, which was built in the 1990s. Completed denim leaves this addition via conveyor belt, which can be seen at right of picture, and takes it to the distribution center.

Additions for Improved Production Flow

The flow of millions of pounds of material within a given mill required a great deal of thought and planning to allow for efficient flow. In many ways the flow determined the physical layout of a mill structure. For multi-story mills, inefficient flow could result in high handling costs or decreased production. At the sprawling complex of Fulton Bag and Cotton Mills, a "young industrial engineer" told *Textile Industries*, "Just imagine what you could do with this if it was all on one level."[136] *Textile Industries* also reported that "Management readily admits that the physical layout of the plant raises materials handling costs and causes more than a few production headaches."[137] In the late 1990's, Greenwood Mills, owner of a Lindale Georgia mill, decided to dramatically scale back jobs at its Lindale mill. Bill Whaley, senior vice president of Greenwood Mills, admitted that the multi-storied layout of the

plant resulted in a great deal of expense being added in order to move the product throughout the facility.[138] This concern with product flow, and the sometimes inefficient nature of older mill buildings resulted in some spaces being added to allow for transitional or staging spaces. At LaGrange's Unity Cotton Mill, known as Kex, an addition was added after 1950 directly onto the mill's cloth room.[139](**Figure 27**) The one-storied addition was added directly onto the main mill face, but was separate from the mill. There are no divisions between the additions, which was used as transitional space for the cloth room, where the cloth was inspected. The addition is windowless with a brick veneer over load-bearing concrete walls, and entirely columnless with a steel-truss roof system. The cloth room, which was a pre-World War II addition, by contrast has broad window bays as well as cast iron columns. The addition simply served as transitional space between the main mill and the cloth room to allow for improved product flow.[140]

Figure 27: Photographer facing south, Photograph of one storied windowless transitional space at Kex, LaGrange, Troup County, Georgia. Photograph in possession of author taken February 3, 2011. Main mill is in far left of picture and warehouses are on right.

The Importance of Open Space in Georgia's Textile Mills

` An open, uninterrupted, interior floor plan was an essential component of a successful textile mill. Interior steel framing with non-loading bearing walls offered a degree of open interior space that interior wood or cast-iron did not allow.[141] In some limited cases there were attempts to create even more uninterrupted space than that allowed by steel-framed construction. A textile mill built to allow complete unbroken space was built by Jefferson Mills in Jefferson, Georgia in 1966-1967. This new mill, known as the Southworth Division of Jefferson Mills, according to an *Atlanta Constitution* article reduced the number of steps required to complete the textiles process was reduced from eighteen to six.[142](**Figure 28**) The Southworth Division of Jefferson Mills utilized a cable-truss system, which allowed tension cables to support the weight of the roof.[143] At its core though, Jefferson's 1967 mill embodied many of the same features seen in other post-World War II mills and additions, because it was windowless, built with air-cleaning units, and one-storied. There were more conventional attempts to allow for completely unbroken space. Located just a few miles southwest of Athens, Georgia, Puritan Cordage Mills (also known as Mallison Braided Cord Company) was involved in the lucrative rope-making business.[144] When Puritan expanded in 1950, it added a two-story addition onto the south end of the main mill.(**Figure 29-30**) The top floor of this addition utilized an arched, steel bow truss construction technique that negated the use of interior columns. This 1950 addition had an arched roof which was atypical of mill roof construction.[145] These unusual examples display the importance, and desire for mills to create uninterrupted production spaces.

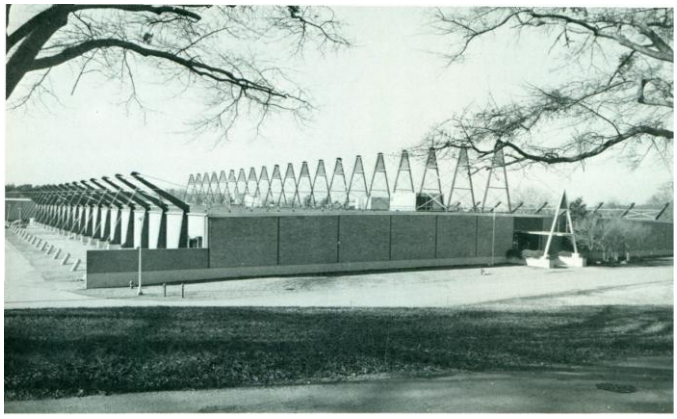

Figure 28: Image above of Jefferson Mills Southworth Division, Jefferson, Jackson County, Georgia, from John Linley's, *The Georgia Catalog: Historic American Buildings Survey: A Guide to the Architecture of the State*, 233.

Figure 29: Photograph of exterior of building #5 (1955 Addition) at Puritan Cordage Mills, Clarke County, Georgia, Photograph taken June 25, 1995 on file at Georgia Historic Preservation Division

Figure 30: Photograph of Second of second floor interior, Building #5(1955 Addition) at Puritan Cordage Mills, Clarke County, Georgia, Photograph taken June 25, 1995 on file at Georgia Historic Preservation Division

The Disuse of Mill Space

Regardless of the adaptability of textile mill buildings, in many cases, the older sections of textile mill complexes fell into disuse. This was not always because the structures were not sound enough to hold production equipment, but because their locations did not fit into the overall production flow. Columbus's Muscogee Mills, grew to include seven distinct mill buildings. Beginning in the 1920s production began to be shifted out of the oldest portions of the mill, which were Mill #1 built in 1868 and Mill # 2 built in 1880, into the of newer structures at the mill.[146] By 1950, during the final major building phase, production was completely phased out of Mills #1 and #2, not necessarily because the structures were outdated, but because it was difficult to include them into the overall production process.[147] Habersham Mills was similar in that a majority of the oldest portion of the complex mill had either fallen into complete disuse or was used as a machine shop and office area at the time of its closure.[148] Similarly, older mill production spaces were converted to other processes, depending on what fit into the overall process.[149] An efficient flow of materials could reduce handling costs for textile mills, and thus lead to the demise of some former production space.

Mill Additions Effect on Related Mill Resources

One important issue to consider with mill additions is how they affected other possible mill related resources, such as a mill's mill village. Textile mills, when initially built generally occupied a large amount of space. A typical turn-of-the-century mill complex contained not just the main mill, but auxiliary structures like the powerhouse, external weave sheds, warehouses, in addition to space for direct railroad access.(**Figure 31)** Thus there tended to be a fair amount of vacant space that a mill could utilize as it added additions, and commonly mill additions rarely affected other resources. There were certainly cases where mill expansions removed or encased associated mill resources. For instance, Trion's mill expansions following World War II resulted in the destruction of a community store in order to connect the main mill with the finishing plant. Mills in urban areas in some cases struggled to find enough space, and did at times encase or remove non-mill-related structures during expansions. Rural mills, generally were located on large tracts of land, made possible by the ownership of land for the mill in addition to mill villages and company houses. Mill housing, in some cases, fell victim to mill expansions. When Willingham Cotton Mills expanded in 1967, it removed at least eight mill houses which were located directly next to the mill.(**Figures 32-33**) Even though additions could and did damage or destroy mill related resources, in most cases additions were constructed in such a way to have as little impact to associated mill resources.

Figure 31: Photograph of Sachem Mills, Winder, Barrow County, Georgia, 1948, Winder, Barrow County, Georgia, brw011. Photograph courtesy of Vanishing Georgia, Georgia Division of Archives and History, Office of Secretary of State. The mill complex of Sachem Mills shown above is typical of most of Georgia's mills. Included in the complex were the main mill warehouses, weave shed, powerhouse, and direct rail access. There was a significant amount of vacant space generally found around a mill, generally separating the mill from the company owned mill village.

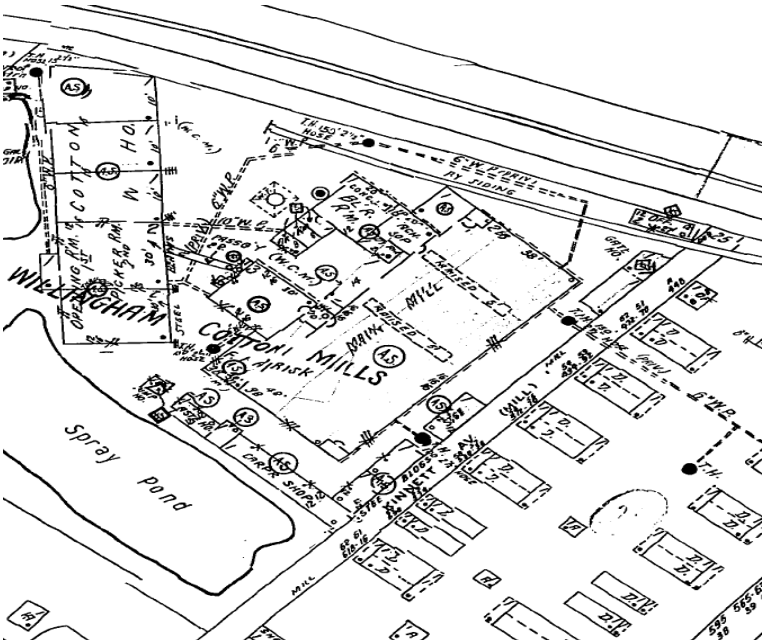

Figure 32: Sanborn Fire Insurance Map, Bibb County, Macon 1924-Feb. 1951 vol. 2, 1924-Feb. 1951, Sheet 238. Accessed through Proquest. Willingham Cotton Mills 1967 addition required the removal of the mill housing shown to the right of the mill complex in the map.

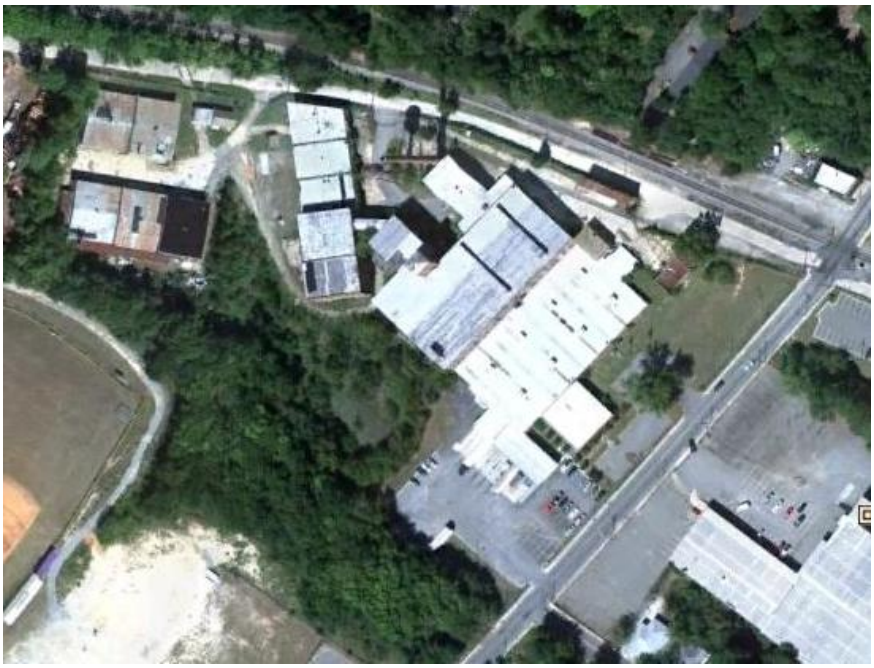

Figure33: Aerial view of Willingham Cotton Mills. Macon, Bibb County, Georgia. Courtesy of Google Earth, Satellite Image Date October 7, 2010. Notice location of addition in relation to location of mill housing in previous Figure.

Post-World War II New Textile Mill Construction and Unchanged Mills

Even though older textile mills, were highly adaptable to changes and alterations, they were at a clear disadvantage to newer textile mills.[150] Besides the overall improvement in construction materials and techniques, such as steel columns and non-load-bearing walls, there were other significant advancements in new construction techniques. A key contributor to older mills having to modernize and make efficient use of space and product flow, was the significant advantages held by the newer one-storied mills. These improvements influenced additions at older mills. One-storied mills were not introduced after World War II, but because of the Great Depression and wartime rationing, their proliferation did not begin until the 1950s and 1960s. An early one-storied mill in Georgia was the previously mentioned Chicopee Mills near Gainesville, Georgia. Chicopee Mills, built in 1927, still maintained the length of a textile mill, but lacked the height.[151] The production process at Chicopee

Mills was designed to move in a straight line, moving from one end of the mill to the other. The technological constraints placed on textile mills when water or steam engine drove all the machines was no longer present, as individual electrical drives allowed for better flexibility. Having materials move in a straight line throughout the textile mill, was still a revolutionary design following World War II.[152] One-storied mills allowed for flexible machinery placement, efficient product flow, easier air conditioning, and ease of expansion.[153] One-storied construction also allowed for wide column spacing, because no second floor with machinery had to be supported. The textile industry could not know what new machinery would come out, and more importantly how large this machinery would be. Wider column spacing made it easier to place new equipment, but also it was easier to integrate machinery into a process that followed a straight path.

An example of a one-story textile mill built in Georgia, with many of the common superior construction techniques was Clarkesville Mill in Clarkesville, Georgia.(**Figure 34**) Clarkesville Mill, when initially built in 1951 was one-storied, steel framed, with non-load-bearing concrete-block walls. The mill had a rectangular shape, and the interior process followed a U-shape or circular process.[154] The mill was added onto during various expansions, with additions added where they were needed, and included additional space for slashing, weaving, and transitional storage space. Adding onto the mill was relatively easy because the non-load-bearing walls could be easily removed.

Figure 34: Undated photograph of Clarkesville Mill from Genealogy Room at Clarkesville-Habersham County Library, Photograph probably made soon after the mill was completed in 1951, as there are no additions to the mill

One major issue to consider is that a textile mill could be modernized without a single addition being added.[155] Habersham Mills, after being purchased by Russell Corporation in 1977, underwent significant modernizations, including adding equipment to allow for the processing of synthetics. Modernizations (both those already conducted and planned at the time of a June 1980 *Textile World* article) included replacing every piece of equipment in the mill, while not adding a single significant addition.[156] Many factors effected the ability of mills to remain free of large additions. A mill could conceivably continue to produce one product throughout its existence, keep the same production space and increase production only by adding modernized equipment.

The Cyclical Nature of the Textile industry and Reasons for its Decline

One issue that must be addressed is the cyclical nature of the textile industry, a factor that influenced the ability of Georgia's mills to expand, and be competitive long term.[157] One has to understand this cyclical nature to have a fuller understanding of the decline of the textile industry, because during boom times profits went toward increased production or shareholders, with a relatively

small percentage of profits actually directed at new technologies, which held the industry back during bust times, when profits were hard to achieve. The industry is a classic boom and bust industry, because during good times mills will run full time with extra shifts, but can just as easily fall into a decline where a mill may cut employees and number of days producing. The decades after World War II, experienced considerable boom and bust periods. In 1947, one industry analyst reported that "The cotton textile industry is currently operating near capacity, with mill production now generally sold up through the last quarter…"[160] Two years later in 1949, the United States textile industry experienced a drastic downturn, because of high production costs and decreasing cloth prices.[159] Georgia, called "a typical situation" lost several mills, with many more running fewer shifts.[160] Declines continued in the first years of the 1950s, where "More mill closings or curtailments were announced, (and) new price reductions were made…Mills also were selling their products below cost to keep operating."[161] An upturn in the mid-1950s became a swift downturn in the late 1950s, forcing widespread mill closings and fewer shifts.[162] Yet again in the late 1950s, the textile industry would enter a dramatic upturn that erased much of the damage done by the preceding downturn of the early 1950s.[163]

By the early 1970s however, the plight of the textile industry in Georgia, as well as in the broader Southeastern states, where the industry was firmly based, seemed to be fairly bleak. A chief problem was the need to increase capital spending to make mills more cost efficient and productive. Mills had to cut costs to keep prices low to compete with foreign imports.[164] Mill expansions, became increasingly rare in the 1970s and 1980s as mills did all they could to maintain the status quo, although there were brief upticks in the plight of the industry.[165] As one textile industry publication put it during the 1970s "… imports and pressure from federal safety regulations ripped the profits-some would say, the heart-out of the textile industry."[166] Many larger textile mill companies cut back on facilities in order to remain competitive. The case of one Georgia company, Bibb Manufacturing Company, illustrated this case. In the early 1970s Bibb Manufacturing Company had to divest itself of four of its twenty-two mills, because the operating costs were too high, and were a financial detriment to the company.[167] Mills in the mid-

1980s faced a constant battle of spending and modernization, and as one industry expert believed, there were "two groups within the industry: The ones that are aggressively modernizing and buying the latest machines and…another group that isn't-and they aren't going to be around in 10 years."[168] Today, many of the textile industry giants, that were thought to have the ability to save and carry on the legacy of the textile industry no longer exist or produce domestically, with many seeing their demise in the last years of the 1990s or the early 2000s, as many mills were faced with constant pressures to modernize and change.[169]

With each downturn, some textile mills went out of business, and overall employment was negatively affected by machinery modernizations, which were essential to keeping textile mills competitive. New technology and new additions were not cheap, and became more important, in many cases, than the hands that worked the machinery.[170] In 1973 a modern mill with updated equipment could use 43 workers in eight hour shifts, to do the same amount of work as an outdated mill with 70 workers.[171] Thus employment declined throughout the decades following World War II, although there were occasional upticks in employment. In 1945 the United States textile industry employed 1.3 million people, but in 1964 employment was then down to around 920,000, then down to around 700,000 in 1985, and further down to around 650,000 in 1993.[172] For Georgia, the long-term employment trends are similar. In 1940, Georgia's textile industry employed 85,443 people, but in 1950 employment moved up to 103,325, then down to 96,288 in 1960, but saw a swing upward in 1970 to 112,992.[173] In 2009 Georgia's textile industry employment was below 46,000, a figure which included all facets of the textile industry.[174] This statistic is misleading, in that the bulk of the textile work-force was employed by carpet manufacturers. Most of the nearly 30,000 carpet related jobs in Georgia were located in Catoosa, Murray, Walker, and Whitfield, which are the four counties surrounding carpet rich Dalton.[175]

The failure to develop new and modern equipment within the United States also negatively affected the entire domestic textile industry. [176] Textile mills in many cases relied on textile machinery manufacturers to innovate, but for a number of reasons these textile machine manufacturers were slow to

innovate.[177] Textile machinery manufacturers were reportedly only interested in advanced research beginning in the twentieth century, and did not ramp up research and develop expenditures until after World War II.[178] In-house innovation was not a high priority for many textile firms and in 1966 it was reported that "Relatively few of the textile mills presently have research programs."[179] It may be of note that textile manufacturers, were not in the forefront of inventing manmade or synthetic fibers, but that large chemical companies, experienced with chemicals, glass and plastic, for the most part, invented and then marketed them to textile mills.[180] One factor negatively influencing mill development, was the small size of most textile firms. The owner of one unnamed family owned Georgia firm was typical in that 1961 his "business lack(ed) the capital necessary for developments."[181] This mill was taken over by a larger textile firm, which could then invest in equipment that allowed loom tenders to operate more looms because of improved technology.[182] If mills did have the financial means to invest in new machinery, they had to look overseas for the newest and best equipment.[183] Long after rope-driven drive systems had been replaced by more efficient and flexible point-of-use electric systems, some Georgia mills relied on rope drives. Columbus's Bibb Mill used rope drives in portions of the original mill as late as the mid-1950s, and WestPoint Pepperell's Columbus Manufacturing Company still ran some carding machines on rope drives in the mid 1970s.[184]

Some portions of the Georgia textile industry did experience success, and widespread growth following World War II, with the carpet industry in Georgia, being the best example. The carpet industry as late as World War II remained in the Northern states, but by 1958, it was reported that 60 percent of all carpet looms were in the South, displaying the possibilities of some facets of the textile industry to grow.[185] The Georgia carpet industry, which would eventually be centered around Dalton, in Northwest Georgia, benefitted from its ability to deftly utilize synthetic and manmade fibers.[186] In 1964 it was reported that "Carpets are one of the fastest growing markets for synthetic fibers." [187] The carpet industry, although built in a region that had a long tradition of textiles, captured new markets, utilizing

new technologies and products to differentiate it from the traditional textile industry in Georgia, or the broader South.

A chief factor in the demise of the Southern textile industry was the abundance of cheap, foreign textile imports. The amount of textile imports had undoubtedly increased, but the threat of foreign textiles had not been an instant concern after World War II. There was a widespread belief in the industry that Georgia's position among textile manufacturers, along with the broader South's textile industry in the world, was destined to grow. In 1951 the United States' market share of global textiles grew to 15 percent, compared to only 5 percent in 1937, although the overall size of the global textile industry made up of exports during this period was smaller than in previous years.[188] In 1951 with the share of textile exports by the United States increasing, there were worries about exports from low-wage countries, and a concern that these countries could also produce their own textile product, reducing the demand for worldwide exports.[189] Between 1961 and 1969 the amount of imported textiles and apparel into the United States increased from 189 million pounds to 488 million pounds.[190] The threats from an increase in foreign textiles was not a new phenomenon. Japan during the 1950s was a chief supplier of foreign imports, but in the 1960s Hong Kong, India, Pakistan, and Taiwan became huge exporters into the United States, with an increasing volume coming from many South American countries.[191] One student of the textile industry found that in the mid-1960s, that even though low-wage markets had an advantage over industrialized countries like the United States, higher-paid United States workers were generally more productive, but labor costs per linear yard was far greater in the United States.[192] In order to fully compete with the cheaper labor of foreign markets, United States textile mills were required to invest in time and labor saving devices. As markets open up worldwide, textile producers become vulnerable to international market fluctuations and import pressures. One authority of the worldwide textile market believed that "In many ways, today's textile and apparel industries are one global sector-with one market" making it ever more difficult for the Southern textile industry to compete, regardless of automation and modernization.[193]

Preservation Issues and Conclusion

One issue that plagues the preservation of many post-war additions is that in many cases the one distinguishing stylistic feature of post-war additions, is the lack of any significant stylistic features. A solid brick veneer lacks the stylistic and aesthetic value of a traditional textile mill facade, with its ornate brickwork and tall arched windows. Additions further confuse the situation because some additions cannot be effectively removed, whether it is because they were added directly on a mill facade, or because a mill facade is entirely removed to fully open up an addition to the interior of a mill. The lack of aesthetics does not negate the importance demonstrated by the different construction techniques and requirements in textile mill construction following World War II. Technological improvements completely altering the requirements of a textile mill, and thus it is essential to understand post-war trends in textile mills. As one trade journal pointed out, a modern mill was significant for its style that "embodies the simplest type of construction."[194] It is no surprise why preservation efforts would focus in many cases on removing the exterior additions, with preservation efforts focused on restoring the traditional mill facade. In realty, however, this traditional facade, with its broad windows, and narrow construction techniques, became a detriment to textile mills. The vast assortment of additions and range of new mill construction in many cases displayed the inherent difficulties in making older mills competitive without radically changing the mill complex. Additions were added to allow for integration of process, additional production space, flexibility, and many other important functions, highlighting their historical significance. These mill additions, made older mills more efficient, even if aesthetically they currently tend to detract from the mill's integrity. Their vast improvements in construction technology and improved flexibility allowed mills to expand following World War II.

In essence, when textile mill additions are removed, it is similar to peeling away layers of history; layers of history that although ugly and unattractive, are exciting and interesting, telling the story of an industry adapting to survive. If preservation efforts focus on taking a mill down to its historic core, this is certainly understandable, as this is undoubtedly what makes restored mill's marketable and commercially

successfully. Preservation of Georgia's mills is certainly desirable to the other possible fates that await, and unfortunately have befallen so many. It is simply important to understand the reason behind the radical changes in textile mills that occurred in the decades following World War II.

Endnotes

[1]For example see Robert W. Blythe, "Unraveling the Threads of Community Life: Work, Play, and Place in the Alabama Mill Village of the West Point Manufacturing Company," *Perspectives in Vernacular Architecture*, Vol. 9 (2003), 135-150, David L. Carlton, *Mill and Town in South Carolina, 1880-1920* (Baton Rouge: Louisiana State University Press, 1982), Douglas Flamming, *Creating the Modern South: Millhands and Managers in Dalton, Georgia, 1884-1984* (Chapel Hill, NC: University of North Carolina Press, 1992), and Jacquelyn Dowd Hall, *Like a Family: The Making of a Southern Cotton Mill World* (Chapel Hill: University of North Carolina Press, 1987).

[2]The research potentials for the textile industry in Georgia, and the broader South, following World War II are limitless. For example, what were the implications of a shift from rail based transportation to highway based transportation? How did the shift away from family ownership effect mills? The ongoing racial integration of textile mills is another area ripe for research. Textile mills in many cases integrated because African Americans were an untapped labor source. See Merrill L. Johnson. "Postwar Development in the Southeast and the Pioneer Role of Labor-Intensive Industry," *Economic Geography*, 61:1 (January 1985), 57-58. There are a range of other issues that could and should be examined concerning the changes in the textile industry following World War II.

[3] For information on the rise of the carpet industry in Georgia see Randall L. Patton and David B. Parker, *Carpet Capital: The Rise of a New South Industry* (Athens: University of Georgia Press, 1999), and Randall L. Patton, *Shaw Industries: A History* (Athens: University of Georgia Press, 2002).

[4]See Johnson, "Postwar Development in the Southeast and the Pioneer Role of Labor-Intensive Industry," for a comparison of the textile and apparel industries in the Southeast in the decades following World War II. It may be of note that apparel industry plants also switched to almost totally windowless plants in the 1950s and 1960s.

[5] For an in-depth discussion of the global textile industry see Kitty G. Dickerson, *Textiles and Apparel in the Global Economy* (Columbus, OH: Merrill, 1999). Mary J. Oates argues that the introduction of textiles in 207 Piedmont counties, actually negatively affected the industrialization of these counties. See Mary J. Oates, *The Role of the Cotton Textile Industry in the Economic Development of the American Southeast* (New York: Arnco Press, 1970).

[6] Dickerson, *Textiles and Apparel in the Global Economy*, 127. The decline in the United Kingdom's textile industry was astounding. In 1917 it reported nearly sixty million spindles, which by 1950 was cut in half to a little under thirty million with the decline continuing in the 1950s and 1960s. William Hays Simpson. *Some Aspects of America's Textile Industry: With Special Reference To Cotton* (Columbia: Division of General Studies, University of South Carolina, 1966), 93.

[7] Dickerson, *Textiles and Apparel in the Global Economy*, 127. Japan's textile industry was devastated during World War II, but grew again after the war with the help of United States textile industry, but then fell into decline in the 1960s because of imports from other Southeast Asian countries. Simpson. *Some Aspects of America's Textile Industry,* 98.

[8] Simpson. *Some Aspects of America's Textile Industry,* 5, 6, and 12. The New England States saw a steady increase in active firms and active spindles throughout the nineteenth century.

[9] Dickerson, *Textiles and Apparel in the Global Economy*, 38. Countries including Pakistan, India, and China became chief textile exporters.

[10]Since Georgia's textile industry exists within an international context, in many cases trends in Georgia are reflected throughout the Southeastern region. The trend of textiles rising and declining is similar within North Carolina, South Carolina, Georgia, and Alabama. Thus it is beneficial to discuss both statewide and regional trends in conjunction.

[11]"City Nervously Awaits Closing of Textile Plants," *Atlanta Journal Constitution*, January 12, 2004, A12.

[12]Paul Hemphill, "Nightfall on a Company Town," *Georgia Trend* (November 1991): 39-40. This *Georgia Trend* article described mill villages as "scruffy low-rent enclaves far from the mainstream of American life." Hemphill, "Nightfall on a Company Town," 37. For more information on the construction of mill communities see Blythe, "Unraveling the Threads of Community Life," Additionally, Mildred Andrews finds that the selling of mill houses had started in some mills in Virginia, North Carolina, South Carolina, and Georgia before World War II, but following World War II the process sped up with many mills divesting themselves of company houses. See Mildred Gwin Andrews. *The Men and the Mills: A History of the Southern Textile Industry* (Macon. GA: Mercer, 1987), 199.

[13]For information on the loss of employment in counties dominated by textiles see Amy Collins, *Industrial Development in Georgia, 1958-1965* (Atlanta: Georgia Institute of Technology, Engineering Experiment Station, 1967).

[14]Two examples of communities in Georgia that have had to reinvent themselves because of a loss of their textile industries are Thomaston and West Point. Thomaston, at one time the home of Thomaston Mills and various other textile concerns, followed a program of attracting other industries and retraining employees. See Peralte C. Paul, "Thomaston Reweaves A Post-Textile Economy: The Loss of 1,400 Jobs In 2001 A Wake-Up Call For Upson County," *Atlanta Journal Constitution*, November 15, 2003, A1. The West Point area, which at one time relied on textile mills from the area now known as Valley, Alabama, welcomed the arrival of a Kia plant in 2010. See Larry Copeland, "Kia Breathes Life into Old Georgia Textile Mill Town," *USA Today*, March 25, 2010, 5A.

[15]For a discussion of the transition of the textile industry from the New England states to the southeastern states also see Nancy Frances Kane, *Textile in Transition: Technology, Wages, and Industry Relocation in the U. S. Textile Industry, 1880-1930* (New York: Greenwood Press, 1988). The study focuses on the North Carolina and Massachusetts textile industry. Kane believes that the lack of skilled workers, lack of southern capital, and lagging improvements in textile equipment slowed the transition of the textile industry from the Northeast to the South.

[16] Simpson, *Some Aspects of America's Textile Industry,* 8. Spindles are often used to judge the size and activity of the textile industry, as spindles were used in one of the final processes before fibers are woven.

[17] Ibid., 9.The New England states held a similar dominance in looms in the same period, operating 114,982 compared to 6,256 in the South.

[18]Ibid., 10.

[19]Andrews. *The Men and the Mills*, 185-186.

[20] "Southern Competition Blamed For Textile Mills Closing," *Wall Street Journal*, March 25, 1954, 4.

[21]For information on the decline of a New England mill see Laurence F. Gross, *The Course of Industrial Decline: The Boott Cotton Mills of Lowell, Massachusetts, 1835-1955* (Baltimore, MD: John Hopkins Press, 1993). For information on the slow adoption of new technology by Northern mills see William Mass, "The Decline of a Technological Leader: Capability, Strategy, and Shuttleless Weaving, 1945-1974," in *Business and Economic History*, Second Series, Volume 19, 1990, 234-244 (Paper presented at Business History Conference March 23-25, 1990) The trends seen in Northern mills will later be largely replicated in Southern mills, and will be discussed later in the article.

[22]Georgia Power Company, *Industrial Georgia: Cotton Manufactures* (Atlanta: Georgia Railway and Power Company, 1922), 7. The publication confidently stated that "Cotton manufacture here is just beginning its real development." Ibid., 5.

[23]"Textile Mills Built Last Year," *Atlanta Constitution*, January 19, 1896, 16.

[24] Kane. *Textile in Transition, 10.* By 1930 a southern worker was still about 30 percent cheaper than his northern counterpart.

[25]Simpson. *Some Aspects of America's Textile Industry,* 12.

[26]John S. Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills: in the Empire State of the South, to 1940: An Industrial Context Statement for Georgia,"1994 on file at Georgia Historic Preservation Division, Atlanta, Georgia. Southern mills were also very similar to those falling into disuse in the New England States. There are a few differences between mills built in the early 1800s and the time period when textile mills grew rapidly in the South including; larger window opening and roofs that were generally flat, but there were many similarities, as mills were still multistoried with belt driven machines. Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills: in the Empire State of the South, to 1940: An Industrial Context Statement for Georgia," III-17. For a discussion of the development of the mill form prior to World War II see Robert Bylthe, "The Textile Mill and Mill Village in the American South," In *Cotton Mills, Planned Communities and the New Deal: Vernacular Architecture and Landscapes of the New South* (Athens, GA: Green Berry Press, 1999), 125-120.

[27]Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills," III-13.

[28]Betsy Hunter Bradley. *The Works: The Industrial Architecture of the United States*. (New York: Oxford University Press, 1999), 96. Bradley details the conversion from belt drives to electric driven mill machinery in mills, with the first electric drive installed at a mill in Columbia, South Carolina in the 1890s. Ibid., 96. For an additional discussion of the early transitions in powering textile mills see Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills."

[29]Mark Thormann, "The Architectural Evolution of Textile Mills in Georgia," 2005, 7, on file at Georgia Historic Preservation Division, Atlanta, Georgia, and Bradley, *The Works*, 162.

[30] Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills," III-13. This also limited the placement of equipment, as windows had to be left open to the exterior.

[31]Bradley. *The Works*, 127.This also resulted in mills being mostly divided into horizontal compartments.

[32]Ibid., 128. Slow burning construction also utilized multiple layers of floor planking and flat roofs which are seen in almost every Georgia mill built in the 1880s-1920s.

[33]Ibid., 126. The dangers of vibrations, as well as the necessity of having adequate light, lead to the eventual adoption of the one story weave shed, with a saw tooth roof. Cast iron and steel could also warp in an intense fire. Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills," III-16.

[34]Bradley, *The Works*, 138. Attempts at the use of widespread cast iron were halted after a mill collapsed in Lawrence, Massachusetts, where one of the main culprits of the collapse was determined to be cast iron. Ibid., 139. The use of cast iron columns to frame an entire mill in Georgia is rare, with one spectacular example being Martha Mills in Thomaston, Georgia, built in 1926.

[35] Bradley, *The Works*, 129.

[36]Ibid., 144.

[37]In 1951 it was reported that "For all types of modern building the framed structure, in either steel or reinforced concrete, is rapidly replacing the solid load-bearing wall structure. The framed building gives greater strength and stability, allows freer arrangement of units within the enclosing walls and permits easier alteration." Edward David Mills, *The Modern Factory* (London: Architectural Press, 1951), 70.

[38]Thormann, "The Architectural Evolution of Textile Mills in Georgia," 12. One issue with modernizing mill structures is that it resulted in downtime for the mill. A 1954 *Wall Street Journal* article pointed out that this down time resulted in a loss of profit, a loss that could seldom be afforded by most mills, and when mills had extra profits they gave it to share holders or increased production rates. Dewitt C. Morrill, "Burlington Mills' Move to Buy Control of Pacific Mills Is Latest in Trends to Bigger, Varied Textile Firms," *Wall Street Journal*, July 12, 1954, 10.

[39]James H. Kennedy, "Today's Engineering Is Geared for Tomorrow," *Textile World*, 102:2, (February 1952),119-120.

[40]"Bibb City Historic District" National Register Nomination Form, 2001, on file at Georgia Historic Preservation Division, Atlanta, Georgia. There are other various additions, dating as late as the 1960s, which are generally relating to weaving or auxiliary processes. The later additions were reportedly powered by electricity. Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills," III-14.

[41] "Griffin Manufacturing Company" National Register Nomination Form, 2001, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[42] A post World War II promotional video produced by General Electric detailed the extensive ways mills were modernizing. One key factor pointed out was the adoption of "power at the point of use," which were small electric drives that could drive a single machine. Power at the point of use allowed for

greater flexibility within the mill space. See "How Textile Mills are Modernizing," Wolff Studios. General Electric Company, 1948. Available at Prelinger Archives. http://www.archive.org/details/HowTexti1948, 2011.

[43]See "Georgia Plants Need 62,500," *Atlanta Constitution*, August 10, 1944, and "Textile Mills Need 2,000 Operatives," *Atlanta Constitution*, November 30, 1944, 9.

[44]Gertrud Lovasy, "Rise in U.S. Share of World Textile Trade," *Staff Papers-International Monetary Fund*, 3:1 (April 1953), 51.

[45]Sterling Slappey, "From Barracks To Looms: Georgia's Spindles As 225 Soldiers Assist," *Atlanta Constitution*, December 29, 1944, 10.

[46]Ibid., 10.

[47]Charles Josey, *Hard Times, Good Times 1899-1999: The First 100 Years of Thomaston Mills*. (Columbus, GA: Columbus Productions, 1999), 90. This was compounded by the suffering already experienced during the Great Depression, during which Billy Hightower, who would eventually be at the helm of Thomaston Mills, recounts that "the machinery was being held together with baling wire…" Ibid., 90.

[48]Solomon Barkin. "The Regional Significance of the Integration Movement in the Southern Textile Industry," *Southern Economic Journal*, 15:4 (April 1949), 402.

[49]Andrews, *The Men and the Mills*, 176.

[50]Ibid., 177. It was estimated that nationwide the textile industry would have to invest up to 500 million dollars to update its plants. *Textile World* predicted a "scramble" for machines to convert from heavy war material (which used heavy yarns), to consumer goods(which used finer yarns). "Technical Problems of Reconversion Not Severe," *Textile World*, 95:6 (June 1945), 95-96.

[51]Bill Boring, "Georgia Ready: State , Primed for Industrial Boom, Faces Changeover With Little Grief." *Atlanta Constitution*. 26 August, 1945. 9A. LaGrange Georgia was held up as an example of a local economy dominated by textile mills that would seamlessly convert from military products to civilians products with no ill effects on employment. See Eleanor Orr, "Mills, Without Halting, Switch To Making Civilian Goods," *Atlanta Constitution*, August 19, 1945, 2B.

[52]Andrews, *The Men and the Mills*,52.

[53]Barkin, "The Regional Significance of the Integration Movement in the Southern Textile Industry," 403.

[54]Ibid., 403.

[55]"Modernization Plans Are Being Prepared Now." *Textile World*, 95:2. (February 1945), 119.

[56]Ibid., 119. The same article did question if an older mill could compete with a newer mill.

[57]The description provided attempts to first detail how the process worked in most mills after World War II ended, and notates significant changes in the process. A range of sources were used to detail the

textile making process. Sources included, "A Bird's-Eye View of the Manufacture of Cotton Cloth" from The ABC of Textiles form Raw Material to Finished Fabric Cotton, 1938. in Debbie Curtis Toole, editor, *Cotton Mills, Planned Communities and the New Deal: Vernacular Architecture and Landscapes of the New South*. Athens, GA: Green Berry Press, 1999), 126-127., Office of Enforcement and Compliance Assurance, Environmental Protection Agency. *EPA Office of Compliance Sector Notebook Project: Profile of the Textile Industry*. Washington DC. September 1997., Rose N. Zeisel, "Modernization and Manpower in Textile Mills" *Monthly Labor Review*, 96:6 (June 1973), 18-25., and United State Department of Labor and Bureau of Labor Statistics. *Technology and Manpower in the Textile Industry of the 1970's.* Washington DC: Government Printing Office, Bulletin No. 1578 August 1968. Additionally, a visit on January 17, 2011 to Trion's Mount Vernon Mills provided a chance to experience the process in action.

[58]A complete understanding of the process of making textiles is only truly possible if the process is seen occurring. Text does not do the process credit. The widespread changes within the process in the decades following World War II also make a coherent description of the textile making process inherently difficult.

[59] A 1946 *Textile World* article reported that "The installation of automatic equipment was considered, generally, to be the best possibility for reducing operating costs."Automation, modernization, and improvements were an almost immediate concern following World War II "Expect Great Savings From New, Improved Equipment," *Textile World*, 96:11 (November 1946), 189.

[60]Synthetics do not have to be picked or cleaned, thus in the use of synthetics these initial steps can be skipped up to the blending and paralleling process. Andrews. *The Men and the Mills*, 213. Finishing and dying fabric could be considered a fourth step as they are necessary to finish the fabric, and many mills added finishing and dying operations after World War II to be competitive.

[61]The picking process is no longer needed. Zeisel, "Modernization and Manpower in Textile Mills," 19-20.

[62]The inherent "dirty" quality of the cotton, is not present in synthetic fibers, and again why they can skip the first steps and go straight to paralleling the fibers.

[63]Department of Labor and Bureau of Labor Statistics, *Technology and Manpower in the Textile Industry of the 1970's, 18.*

[64]Zeisel, "Modernization and Manpower in Textile Mills," 19. Open-end spinning is similar to pulling clothes out of a spinning clothes dryer.

[65]Depending on the end use of the product, the product may be dyed before the slashing stage.

[66]The shuttleless loom was developed in the 1960s, but its use spread very slowly though Southern mills, even though production speeds were much greater on shuttleless looms. Zeisel, "Modernization and Manpower in Textile Mills," 20-21. Sabit Adanur finds that worldwide in 1994 there were nearly 3.2 million looms in use, with nearly 2.6 being shuttled looms. Sabit Adanur, *Handbook of Weaving* (Lancaster, PA: Technomic Publishing Company, 2001), 6.

[67] For example, when Bibb Mill wanted to introduce a more versatile loom in the late 1980s, it chose a loom that had a maximum width of approximately 169 inches, and in comparison Fulton Cotton and Bag Co. in the late 1960s only had looms that produced fabric up to 120 inches. Isaac McAllister III "Bibb Buys New Looms for Width and Versatility; Alan Davis Bibb's New President, Says company Will Continue to Grow," *Textile World*, 138:10 (Oct 1988), 80., "Fulton Cotton Mills' First 100 Years" *Textile Industries*. (December 1968), 70.

[68]Adanur, *Handbook of Weaving,* 6.

[69]Zeisel, "Modernization and Manpower in Textile Mills," 21., Department of Labor and Bureau of Labor Statistics. *Technology and Manpower in the Textile Industry of the 1970's,* 43-44.

[70]"Addition Is To Be Built On Dixie Mills Costing $25,000," *Lagrange Daily News*, September 1, 1941, 1, and "West Point Manufacturing Company: La Grange, GA," Insurance Map by Associated Factory Mutual Fire Insurance companies, February 18, 1947, in Dixie Mill Vertical File, Troup County Archives, LaGrange, Georgia.

[71]Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills," III-17.

[72]Information from site visit and survey of Dixie Mills, LaGrange, Georgia, February, 3, 2011.

[73] Dixie Mill was built with a system designed by Charles A. M. Pratay, that allowed the other walls to be non load bearing. This was altered, at some point, to give the mill load bearing walls. Lisa Pfueller Davidson, "Through the Mill Documenting the Southern Textile Industry," *Cultural Resource Management*, No. 4 (2000), 15-17. For more information on LaGrange's textile industry, and the many mills built in that locality see, Dean Herrin, et. al. *Textile Industry in LaGrange, Georgia, LaGrange, Troup, GA*. Historic American Engineering Record, HAER No. GA-143.

[74]Dixie Mill Map, WestPoint Pepprell Inc. Corporate Industrial Engineering, Dixie Mill, LaGrange, Georgia, 2/10/1982, in Dixie Mill Vertical Fill, Troup County Archives, LaGrange, Georgia.

[75]Sanborn Fire Insurance Map, Walton County, Monroe, May 1924-Januray 1945 update, sheet 10. and Sketch Machinery Plan, First Floor Proposed Layout, The Monroe Cotton Mills, Monroe, Georgia, produced by J. E. Sirrine Co. Engineers, September 12, 1919, from the private collection of Paul Rosenthal, Monroe, Georgia.

[76]Opelika Mfg. Monroe, GA, Factory Mutual Engineering Association, Factory Mutual System, 25 August, 1975, from the private collection of Paul Rosenthal, Monroe, Georgia.

[77] "Swift Mill" Additional Documentation for National Register Nomination, 2010, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[78] Frances Greene, *The First One Hundred Years* (Author: 1973), 49-50.

[79] Ibid., 49-50. One source relates that the mill closed in 1933, but the sources do agree the mill closed at some point during the Depression. See Baxley, Midge, Marvin McElroy, et al. *To Be Continued…A Pictorial History of Tallapoosa, GA. Vol. I* (Bremen, GA: Gateway Publishing Company, 1999).

[80] "Work Started on New Addition to Thread Mill," *Tallapoosa Journal*, January 22, 1948, 1.

[81] Gail Cooper, *Air-conditioning America: Engineers and the Controlled Environment, 1900-1960* (Baltimore: John Hopkins University Press, 1998), 18.

[82]Ibid., 19 There were also very rudimentary systems to keep cotton moist in storage areas whereby water would be sprayed on the walls to keep the air moist, an obviously imperfect system. See *Cotton Mill Handbook for Superintendents and Overseers in Cotton Yarn and Cloth Mills*. (New York: Bragdon, Lord and Nagle Co, 1922)

[83]Cooper, *Air-conditioning America,*21-22.

[84] Andrews, *The Men and the Mills,*182. Milliken (at the time called Deering Milliken) built this mill, DeFore Mill, near Clemson, South Carolina. This was reportedly also the first mill built without windows. Hogansville's Stark Mill had an early humidification and air circulating system installed when the mill was first built in 1923. Lisa Pfueller Davidson, *Stark Mill (WesTek Hogansville Plant)*. Historic American Engineering Record, HAER No. GA-117, 4-5. Regardless by the mid to late 1940s textile mills built with air conditioning from the ground up was the standard. For an early example of an air conditioned mill in Cornelia, Georgia built in 1946 see "Modern Mill Building Features Control of Air," *Textile World*, 97:1(February 1947), 120-121 .

[85]For a broad discussing on the cotton dust standards see W. Kip Viscusi. "Cotton Dust Regulation: An OSHA Success Story?" *Journal of Policy Analysis and Management*, 4:3 (Spring, 1985), 325-343. The great fear with cotton dust is that it causes byssinosis or "brown lung."

[86]Ibid., 333.

[87]Some mills did chose to place air conditioning units on their roofs, for example Clarkesville Mill and Kex, in LaGrange placed the units on top of the mill. In rare cases production space was used to house air conditioning equipment. Thomaston's Martha Mills did house some condition equipment in production space.

[88]Connie Adams, "An Enduring Dream: The History of Dunson Mill from 1910 to the Present," 1998, in Dunson Mill Vertical Fill, Troup County Archives, LaGrange, Georgia.

[89]Earle Mauldin and Harold E. Reed, "Revitalize Lighting in Your Knitting Mill," *Textile World*, 95:4. (April 1945), 109. Proper lighting could reportedly led to "improvement in quality of the product and reduction of defects, reduction in worker fatigue, reduction in accident rate, and compensation for the poor vision of older workers." Also see "New Light on Southern Mills" *Textile World*, 101:12. (December 1951), 106, and George Eckman, "Air-Conditioning Principles Applicable in Any Mill," *World*, 101:8 (August 1951) 139-141, 204, 205. " Windows were pointed out as chief problem area and that "bricking them in may involve, a rather expensive initial cost, but in most cases this cost is offset by the savings…Also the production savings realized in operating a room without irregularities in temperature and relative humidity are not to be overlooked." Ibid., 139-141, 204, 205.

[90]Roy A. Palmer, "Should Textile Mills Be Windowless?" *Textile World*, 96:1 (January 1946), 121-123.The advantages of windowless mills are clear, but here was certainly no agreement in the immediate wake of WWII if windows should be bricked in as there were obvious benefits to having windows.

[91] Information from site visit and survey of Habersham Mills, Habersham County, Georgia, December, 9, 2010.

[92]These towers, at Dunson or Habersham Mills did not appear to have irrevocably changed the façade, because they used the existing windows as natural openings into the mill's production space. It is conceivable that some of these conditioning towers will irrevocably alter the integrity of the mill if entire window bays are removed.

[93]Simpson, *Some Aspects of America's Textile Industry,* 57.

[94]Barkin, "The Regional Significance of the Integration Movement in the Southern Textile Industry," 397.

[95]Simpson, *Some Aspects of America's Textile Industry,* 56-60.

[96] "Chicopee Mill and Village Historic District" National Register Nomination, 1975, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[97] Davison's Textile Blue Books, published each year, are key resources because they list not only active mills, but in some cases a mill's final product, how many looms, how many spindles, and so on. *Davison's Textile Blue Book* (New York: Davison Publishing Company, 1938-1939), *Davison's Textile Blue Book* (New York: Davison Publishing Company, 1968), *Davison's Textile Blue Book* (New York: Davison Publishing Company, 1974).

[98]J. B. Karfunkle, Barbara A. Kimmelman, and John S. Lupold, *Muscogee Manufacturing Company*. Historic American Engineering Record, HAER No. GA-23, 1977, and "Muscogee Mills" National Register Nomination, 1975, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[99] Sanborn Fire Insurance Map, Muscogee county, Columbus, 1929-1958 update, vol. 1 sheet 1.

[100] Karfunkle et al, *Muscogee Manufacturing Company*, 6. In the mid 1970s Columbus listed 14 individual mills, displaying the unique nature of an integrated mill. The product from Muscogee Mill was cut and sown at another plant, because mills almost did any never cutting and sewing. *Davison's Textile Blue Book*, (New York: Davison Publishing Company, 1974).

[101]"Hawkinsville Commercial and Industrial Historic," District National Register Nomination 2002, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[102]Ibid.

[103]Slashing was singled out as a key area to modernize in a textile mills, as well as dramatically increase production. L. D. Howell, *Changes in American Textile Industry* (Washington, DC: Government Printing Office, 1959), 114.

[104] "Cabbagetown Historic District," Additional Documentation for National Register Nomination, 2006, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[105]"Fulton Cotton Mills' First 100 Years," 75-76.

[106]"Swift Mill," Additional Documentation for National Register Nomination.

[107]Manmade and synthetics fibers came at the expense of cotton, in respect to how much of the market cotton maintained. Roger R. Sharpe, "The Growth of the Man-Made Fiber Industry," *Financial Analysts Journal*, 20:1 (January- February 1964), 225.

[108]It was possible for mills to switch to all manmade fibers. For example, LaGrange's Dixie Mills switched to rayon production. "Dixie is No Cotton Mill, Makes Nothing But Rayon," *LaGrange Daily News*, September 1, 1950, 1. Rayon, a very common and widely used manmade fiber, was made from wood pulp or cotton linters.

[109]Sharpe, "The Growth of the Man-Made Fiber Industry," 43.

[110]There were exceptions to mills adding additions to utilize manmade fibers in addition to natural fibers, like the previously mentioned Dixie Mill. Macon's Atlantic Mills was able to produce manmade and natural fibers, without adding specific additions to house these processes. *Davison's Textile Blue Book*, (New York: Davison Publishing Company, 1969).

[111]Sharpe, "The Growth of the Man-Made Fiber Industry," 44.

[112] Ibid., 44. James B. Thornblade. "Textile Imports from the Less-Developed Countries: A Challenge to the American Market," *Development and Cultural Change*, 19:2 (January 1971), 284. By 1968 synthetic fibers made up 53 percent of textile market.

[113]Earl Edward Muntz, Jr. "An Analysis of the Man-made Fiber Industry." *The Journal of Industrial Economic*, 7:3 (July 1959), 221. In 1958 the plants that manufactured synthetic fibers were also centered in the South, with 52 in the South and 33 in other parts of the country.

[114] "ATCO-Goodyear Mill and Mill Village Historic District," National Register Nomination, 2005, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[115]Ibid.

[116]The National Register Nomination indications that synthetic fiber completely phased out cotton at ATCO. This appears to be incorrect because ATCO is listed as have a final product containing cotton in 1970s. *Davison's Textile Blue Book* (New York: Davison Publishing Company, 1974).

[117]"$1.3 Million Growth Set," *The Macon Telegraph*, May 10, 1967, 10. This addition will be discussed in detail later.

[118] Information from site visit and survey of Martha Mills, Thomaston, Georgia, November, 11, 2011.

[119]"$1.3 Million Growth Set," *The Macon Telegraph*, 10. The *Telegraph* also reported that the reason the addition was a one story was that it allowed for future vertical expansions in the form of new stories. Sanborn Fire Insurance Map, Bibb County, Macon, 1924-Feburary 1951 update, vol. 2 sheet 238.

[120]Ibid., 10.

[121]Scott Kilman and Linda Williams, "The New Mill: While Textile Makers Bemoan Imports, They Are Modernizing, Too," *Wall Street Journal*, September 14, 1984, 1.

[122]Information from site visit and survey of Mary Leila Cotton Mills, Greensboro, Georgia, February 8, 2011.

[123]Lisa Pfueller Davidson, *Stark Mill (WesTek Hogansville Plant)* Historic American Engineering Record, HAER No. GA-117.

[124]Ibid., 7.

[125]Ibid., 7.

[126]Information from site visit to Elm City Mills, LaGramge, Georgia, February, 3, 2011.

[127]"Cabbagetown Historic District," Additional Documentation for National Register Nomination.

[128]Reinforced concrete is hard to alter, or expand upon. Future expansions and flexibility were necessary components of mill construction, making reinforced concrete less than perfect. Mills, *The Modern Factory*, 44.

[129]The exact date of the addition is unknown, but the 1943 Sanborn map shows no such addition. The addition is built with wood columns, which is highly atypical of post-World War II mill construction except for some steel reinforcing framing is used throughout to add strength. Sanborn Fire Insurance Map, Jackson County, Commerce, November 1932-June 143 update, sheet 7.

[130]"Swift Mill," Additional Documentation for National Register Nomination.

[131] Ibid.

[132] "Strickland Cotton Mill" National Register Nomination, 2005, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[133]Ibid. The addition had load bearing brick walls, but also had broad open window bays, displaying that traits of transitional mill construction in the immediate aftermath of World War II. For additional information see Barry S. Herrin, *A History of the Strickland Cotton Mills and the Mill Village of Remerton, Georgia 1899-1975*, 1987.

[134] Information from site visit and survey of Mount Vernon Mills, Trion, Georgia, January, 17, 2011. The mill is also a completely integrated mill, in that raw cotton enters the mill and leaves as finished fabric, which explains the tremendous size of the current mill.

[135]For instance additions were added to install more slashers, move dye ranges, add more weaving, and so on.

[136]"Fulton Cotton Mills' First 100 Years," 69.

[137]Ibid., 69.

[138]John W. McCurry, "Fabric Mills Hit Hard by Imports," *Textile World*, 149:2 (February 1999), 20.

[139]Information from site visit and survey of Kex, LaGrange, Georgia, February, 3, 2011. Sanborn Fire Insurance Map, Troup County, LaGrange, May 1930-October 1950 update, sheet 31.

[140]Another example of transitional space was Martha Mills late 1960s weave mill addition. A little more than half of the structure was devoted to weaving, with the rest serving as transitional warehouse space before the fabric was treated.

[141] Macon's Atlantic Cotton Mill had an arched roof to allow for unbroken space on the second floor. Arched roofs were not used often because it allowed cotton dust to collect around the roof trusses. Information from site visit and survey of Atlantic Cotton Mills, Macon, Georgia, February, 1, 2011.

[142]Duane Riner, "Textile Revolution May Start Here," *Atlanta Journal Constitution,* January 1, 1967, 70. Furthermore, it was reported that the mill combined many of the initial operations, opening, blending, cleaning, picking, and carding, into one machine. Although carding remains a separate process today the other initial steps are combined into one step, done by automated equipment. The mill also reduced the number of workers to complete the process from 200 to 50.

[143]"Jefferson Historic District National Register Nomination," 2003, on file at Georgia Historic Preservation Division, Atlanta, Georgia.

[144]Making cordage involved many of the same steps as other textiles, but it required a braiding process, which made the rope.

[145] "Puritan Cordage Mills," National Register Nomination, 1995, on file at Georgia Historic Preservation Division, Atlanta, Georgia. One can speculate that this form of construction was rarely used because it required load bearing walls, making expansion difficult.

[146] Karfunkle et al, *Muscogee Manufacturing Company,* 5.

[147] Ibid., 5.

[148] Information from site visit and survey of Habersham Mills, Habersham County, Georgia, December, 9, 2010. A mill like Habersham Mills does display the vast changes in mill buildings, as the mill was initially driven entirely by water driven belt systems, but could still be used when electrical power was the chief form of power.

[149]For example, Fulton Bag and Cotton Mills oldest mill building, which dated to 1881, was altered to house the mill's bleaching operation in the 1920s.

[150]Many of these "newer" textile mills built in the 1950s and 1960s are currently or will be eligible for the national register, and thus their historical importance should not be ignored. Additionally mills built in the 1950s and 1960s are different from mills built in the 1970s and 1980s.

[151]"Chicopee Mill and Village Historic District," National Register Nomination. Multi-storied mills were still built in the 1930s. Clark Thread Company (which merged with another company to become Coats and Clark) built a multi-storied mill in 1931, near Powder Springs. The community around the mill became known as Clarkdale and is thought to be the last planned mill village built in Georgia.

[152]"The Mill of the Future," *Textile World*, 95:11 (November 1945), 107. It was pointed out that the straight line design allowed for improved handling costs.

[153]"One-Story Mill Trend Backed By Sound Reasons," *Textile World*, 98:11 (November 1948), 105. One-storied mills were superior in almost every way to older multi-storied mills, because they could be built form the ground up to accommodate better air conditioned, steel framed construction, systems that could mechanically transport goods, and other factors that improved the textile process. These one-storied mills heavily influenced, in many respects, the additions added onto older mills, because similar technologies became common in mill additions.

[154] Information from site visit and survey of Clarkesville Mills, Clarkesville, Georgia, November, 18, 2010. The square mill with the U layout was called the "most significant trend in mill layout" because it allowed efficient flow and places for possible future expansion. James H. Kennedy, "Today's Engineering is Geared For Tomorrow," *Textile World*, 102:2 (February 1952), 119-120. There were certainly one storied mills built after World War II that had a straight line design, that allowed raw products to enter one end and leave the other. For example, WestPoint Manufacturing built such a mill, just to the west of West Point, Georgia in the mid 1960s.

[155]In 1963 Bibb Manufacturing purchased Arnall Mill in Sargent, Georgia and Arnco Mills, located northwest of Newnan, Georgia and spent millions of dollars modernizing the plants and did not add a single significant addition. The mills when bought were "operating with almost obsolete machinery…""Bibb Manufacturing Company," April 1975, 6, Bibb Manufacturing Company Collection, 1980-21, Box 1 Folder 4, Washington Memorial Library, Macon, Georgia. Other mills surveyed underwent modernizations that included no additions, including Habersham Mills, Dusnon Mills, and Atlantic Mills.

[156]"Russell Fields a Winning Team," *Textile World*, 130:6 (June 1980) 20-24.

[157] For information of the cyclical nature of the textile industry, and its tendency to have very distinct boom and bust cycles see T. M. Stanback, Jr. "The Textile Cycle: Characteristics and Contributing Factors," *Southern Economic Journal*, 25:2 (October 1958), 174-188.

[158]"Operations of Cotton Textile Industry Seen Near Capacity Output," *Wall Street Journal*, August, 12, 1947, 10. It is necessary to talk about Georgia's textile industry within a broader context, because Georgia's textile industry experienced the same trends as the broader Southern and United States textile industry.

[159]"Cotton Causalities: More Mills Close As High Costs, Sagging Prices Pin Them In," *Wall Street Journal*, June 10, 1949, 1.

[160]Ibid., 1. The article also stated that textile workers wages were nearly 175 percent of prewar levels, with labor and cotton making up anywhere between 75-80 percent of mill costs.

[161] T. A. Wise, "Textile Markets: Companies Sell Below Cost to Keep Mills Busy; Two More Plants Closed," *Wall Street Journal*, February 18, 1952, 5. A Floyd County, Georgia mill owned by A. D. Julliard announced its closure, blaming poor market conditions and high labor costs. The textile industry would begin to come out of this market downturn in early to mid 1952. See Daniel Wright

"Textile Upturn: Many Sections of Trade Report Pickup Signs After 15-Months' Slump," *Wall Street Journal*, June 16, 1952, 1.

[162] "Many Southern Mills Staying Closed Today as Sales Lag," *Wall Street Journal*, April 1957 22, 7. At Pacolet Manufacturing's New Holland Georgia mill production was cut to four days a week, while previously production had ran six days a week.

[163]Laurence G. O'Donnell, "Textile Mill Profits for 1959 Expected To Show Biggest Return on Sales Since '51," *Wall Street Journal*, December, 28 1959, 18.

[164]Jim Montgomery "Troubled Textiles: Import Competition Is Only One of Many Woes Facing Fabric Makers," *Wall Street Journal*, July 29, 1970, 1 and 22. It was reported that "One mill on the verge of closing its doors is an aging multi-story plant in Georgia" and it cost this plant 18.65 cents a yard to make, and the same product from Hong Kong cost 15.625 cents. Capital spending decreased when it should have increased. The rate of growth of production in the United States textile industry was high between 1963-1973, but slowed significantly in the mid to late 1970s. Dickerson, *Textiles and Apparel in the Global Economy* 194.

[165]H.W. Close, Board Chairman, Spring Mills, Inc. President Textile Manufacturers Institute reported at a Textile Industry Conference in 1972 that "We (the textile industry) are in the middle of a turnaround that has built a strong spirit of confidence in the industry." He also praised the ability of the industry to embrace automation. He stated "Our productivity and our ability to compete will depend to a high degree on how well we automate, eliminate or consolidate processes and achieve complete flexibility." "Proceedings of the Conference on Textile Research," (Atlanta: Georgia Institute of Technology, School of Textile Engineering, 1972), 4 and 6.

[166]Jan Pogue, *For One Glorious Purpose: Georgia Textiles, Our Heritage, Our Future* (Atlanta: Georgia Textile Manufacturers Association, 2000), 28.

[167] "Bibb Mfg. Will Close Four Mills in Georgia," *Wall Street Journal*, September 7, 1971. 19.

[168] Kilman and Williams, "The New Mill," 1. It was also predicted that many small manufacturers would be broken by the ever present need to modernize and the increasing percentage of the American market dominated by imports.

[169]John McCurry "Towel Mills Modernize to Compete" *Textile World*,149:5 (May 1999), 26-37. West Point Stevens was one company that went into the towel business, converting many plants to towel production. These mills, are not longer in operation. Springs Industries Grffin Mill #5 was also pointed out for its modernizations, and it is no longer involved in textile production. *Textile World* discussed the widespread demise of many textile concerns in the first year of the 21st century. McCurry John. W., "Layoffs, Mills Closing Adding Up Fast," *Textile World*, 151:9 (September 2001), 17-19. Many of the largest textile concerns in Georgia met their demise in the last days of the 1990s or early 2000s. Examples include Thomaston Mills, WestPoint Stevens, Burlington, Bibb Manufacturing Company, and innumerable smaller family owned companies, who had held on shedding employment and investing in automation for decades but were finally forced out of business. Many went completely out of business while some shifted to producing in low wage areas of the globe, maintaining only domestic sales operations.

[170] Pogue, *For One Glorious Purpose*, 3.

[171] Andrews, *The Men and the Mills*, 217.

[172] Dickerson, *Textiles and Apparel in the Global Economy* 39, Simpson. *Some Aspects of America's Textile Industry*,4., Kane. *Textile in Transition*, 44. Employment in the U.S. textile industry peaked in 1948 around 1.3 million. Johnson, "Postwar Development in the Southeast and the Pioneer Role of Labor-Intensive Industry," 48.

[173]Johnson, "Postwar Development in the Southeast and the Pioneer Role of Labor-Intensive Industry," 47. See Collins. *Industrial Development in Georgia*, for textile employment statistics in Georgia.

[174]Annual Survey of Manufactures: Geographic Area Statistics for All Manufacturing State U.S. Census Bureau 2009 and 2008 available at American Fact Finder. http://factfinder.census.gov/servlet/IBQTable?_bm=y&-ds_name=AM0931AS101&-geo_id=04000US13&-search_results=01000US&-_lang=en. 12/3/2010

[175] Ibid.

[176]The South found itself in a similar position of the Northern textile industry, which had previously suffered because it too had failed to invest in new equipment.

[177] Zeisel, "Modernization and Manpower in Textile Mills," 19.

[178] Simpson, *Some Aspects of America's Textile Industry,*172.

[179]Ibid., 86.

[180] See Muntz, "An Analysis of the Man-made Fiber Industry."

[181]Penelope Mars, "An Economic Comparison of the Textile Industries in the U.S.A. and the U.K.," The *Journal of Industrial Economics*, 9:2 (April 1961), 192.

[182]Ibid., 192.

[183] The case of Upson County based Thomaston Mills which invested heavily in new equipment in the decades following World War II, was typical, with most U.S. based textile machine manufactures willing to provide replacements, but not advanced, modern machinery. Josey, *Hard Times, Good Times*, 79.

[184]Lupold, "Spindles and Shuttles, Stones and Sifter, Saws and Stills," III-14. These mills were not marginal textile concerns, West Point Pepperell, (known initially as West Point Manufacturing, and later as West Point Stevens) was a prominent textile manufacturing operating mills throughout Alabama, Georgia, and North Carolina, and Bibb Manufacturing was one Georgia's most well known textile firms.

[185]Patton, *Shaw Industries*,6.

[186]Brian Toyne, et al, *The Global Textile Industry*. (London: Allen and Unwin, 1984), 16.

[187] Sharpe, "The Growth of the Man-Made Fiber Industry," 46.

[188] Lovasy, "Rise in U.S. Share of World Textile Trade," 47-48. The largest exporter of world textiles was Western European Countries, which exported 44 percent of world exports, in addition to the United Kingdom which exported 27 percent of world textiles.

[189] For a fuller discussion see, Lovasy, "Rise in U.S. Share of World Textile Trade."

[190]Thornblade, "Textile Imports from the Less-Developed Countries," 277.

[191]Ibid., 277.

[192]Ibid., 280. In some cases U.S. workers are eight times more productive than foreign workers, with labor cost per unit being twice as high.

[193]Dickerson, *Textiles and Apparel in the Global Economy*, 4. In 1971 it was, prophetically predicted that:"In general, it is doubtful that automation in high-wage countries could offset the advantage of low labor costs in less-developed countries." Thornblade, "Textile Imports from the Less-Developed Countries," 282.

[194] L. Verne Lacey, "Functionalism Is Rule for Modern Mill Building," *Textile World*, 97:4 (April 1947), 117. The article also pointed out that florescent lighting and air-conditioning were the two most important factors effecting textile mill construction. One publication described factory exteriors after World War II as simply "screens designed to keep out wind and weather." Mills, *The Modern Factory,* 70.

Bibliography

Archival Collections

Dixie Mill Vertical File, Troup County Archives, LaGrange, Georgia.

Dunson Mill Vertical Fill, Troup County Archives, LaGrange, Georgia.

Bibb Manufacturing Company Collection, 1980-21, Washington Memorial Library, Macon, Georgia.

Books and Published Studies

Adanur, Sabit. *Handbook of Weaving*. Lancaster, PA: Technomic Publishing Company, 2001.

Andrews, Mildred Gwin. *The Men and the Mills: A History of the Southern Textile Industry*. Macon. GA: Mercer, 1987.

Baxley, Midge et. al. *To Be Continued…A Pictorial History of Tallapoosa, GA. Vol. I*. Bremen, GA: Gateway Publishing Company, 1999.

Bradley, Betsy Hunter. *The Works: The Industrial Architecture of the United States*. New York: Oxford University Press, 1999.

Carlton, David L. *Mill and Town in South Carolina, 1880-1920*. Baton Rouge: Louisiana State University Press, 1982.

Collins, Amy. *Industrial Development in Georgia, 1958-1965.* Atlanta: Georgia Institute of Technology, Engineering Experiment Station, 1967.

Cooper, Gail. *Air-conditioning America: Engineers and the Controlled Environment, 1900-1960.* Baltimore: John Hopkins University Press, 1998.

Cotton Mills, Planned Communities and the New Deal: Vernacular Architecture and Landscapes of the New South. Athens, GA: Green Berry Press, 1999.

Dickerson, Kitty G. *Textiles and Apparel in the Global Economy*. Columbus, OH: Merrill, 1999.

Flamming, Douglas. *Creating the Modern South: Millhands and Managers in Dalton, Georgia, 1884-1984.* Chapel Hill, NC: University of North Carolina Press, 1992.

Georgia Power Company. *Industrial Georgia: Cotton Manufactures*. Atlanta: Georgia Railway and Power Company, 1922.

Greene, Frances. *The First One Hundred Years.* Author: 1973.

Gross, Laurence F. *The Course of Industrial Decline: The Boott Cotton Mills of Lowell, Massachusetts, 1835-1955.* Baltimore, MD: John Hopkins Press, 1993.

Hall, Jacquelyn Dowd. *Like a Family: The Making of a Southern Cotton Mill World.* Chapel Hill: University of North Carolina Press, 1987.

Josey, Charles. *Hard Times, Good Times 1899-1999: The First 100 Years of Thomaston Mills*. Columbus, GA: Columbus Productions, 1999.

Herrin, Barry S. *A History of the Strickland Cotton Mills and the Mill Village of Remerton, Georgia 1899-1975*. 1987.

Kane, Nancy Frances. *Textile in Transition: Technology, Wages, and Industry Relocation in the U. S. Textile Industry, 1880-1930.* New York: Greenwood Press, 1988.

Mills, Edward David. *The Modern Factory*. London: Architectural Press, 1951.

Oates, Mary J. *The Role of the Cotton Textile Industry in the Economic Development of the American. Southeast.* New York: Arnco Press, 1970.

Pogue, Jan. *For One Glorious Purpose: Georgia Textiles, Our Heritage, Our Future*. Atlanta: Georgia Textile Manufacturers Association, 2000.

Patton Randall L. and David B. Parker. *Carpet Capital: The Rise of a New South Industry.* Athens: University of Georgia Press, 1999.

Patton, Randall L. *Shaw Industries: A History.* Athens: University of Georgia Press, 2002.

Simpson, William Hays. *Some Aspects of America's Textile Industry: With Special Reference To Cotton.* Columbia: Division of General Studies, University of South Carolina, 1966.

Toyne, Brian et al, *The Global Textile Industry*. London: Allen and Unwin, 1984.

Government Publications

Annual Survey of Manufactures: Geographic Area Statistics for All Manufacturing State U.S. Census Bureau 2009 and 2008 available at American Fact Finder. http://factfinder.census.gov/servlet/IBQTable?_bm=y&-ds_name=AM0931AS101&-geo_id=04000US13&-search_results=01000US&-_lang=en. December 3, 2010.

Davidson, Lisa Pfueller. *Stark Mill (WesTek Hogansville Plant)*. Historic American Engineering Record, HAER No. GA-117.

Herrin, Dean et. al. *Textile Industry in LaGrange, Georgia, LaGrange, Troup, GA*. Historic American Engineering Record, HAER No. GA-143.

Howell, L. D. *Changes in American Textile Industry*. Washington, DC: Government Printing Office, 1959.

Karfunkle, J. B. Barbara, et. al. *Muscogee Manufacturing Company*. Historic American Engineering Record, HAER No. GA-23, 1977.

Office of Enforcement and Compliance Assurance, Environmental Protection Agency. *EPA Office of Compliance Sector Notebook Project: Profile of the Textile Industry*. Washington DC. September 1997.

United State Department of Labor and Bureau of Labor Statistics. *Technology and Manpower in the Textile Industry of the 1970's.* Washington DC: Government Printing Office, Bulletin No. 1578 August 1968.

Textile Industry Publications

Davison's Textile Blue Book. New York: Davison Publishing Company, 1938-1939.

Davison's Textile Blue Book. New York: Davison Publishing Company, 1968.

Davison's Textile Blue Book. New York: Davison Publishing Company, 1969.

Davison's Textile Blue Book. New York: Davison Publishing Company, 1974.

Eckman, George. "Air-Conditioning Principles Applicable in Any Mill." *World*, 101:8 (August 1951).

"Expect Great Savings From New, Improved Equipment." *Textile World* 96:11 (November 1946).

"Fulton Cotton Mills' First 100 Years." *Textile Industries* (December 1968).

Kennedy, James H. "Today's Engineering Is Geared for Tomorrow." *Textile World* 102:2 (February 1952).

Lacey, L. Verne. "Functionalism Is Rule for Modern Mill Building." *Textile World* 97:4 (April 1947).

Mauldin, Earle and Harold E. Reed. "Revitalize Lighting in Your Knitting Mill." *Textile World* 95:4. (April 1945).

McAllister III, Isaac. "Bibb Buys New Looms for Width and Versatility; Alan Davis Bibb's New President, Says company Will Continue to Grow." *Textile World* 138:10 (Oct 1988).

McCurry, John W. "Fabric Mills Hit Hard by Imports." *Textile World* 149:2 (February 1999).

McCurry, John. W. "Layoffs, Mills Closing Adding Up Fast." *Textile World* 151:9 (September 2001).

McCurry, John. "Towel Mills Modernize to Compete." *Textile World* 149:5 (May 1999).

"The Mill of the Future." *Textile World* 95:11 (November 1945).

"Modern Mill Building Features Control of Air." *Textile World* 97:1(February 1947).

"Modernization Plans Are Being Prepared Now." *Textile World* 95:2 (February 1945).

"New Light on Southern Mills." *Textile World* 101:12 (December 1951).

"One-Story Mill Trend Backed By Sound Reasons," *Textile World* 98:11 (November 1948).

"Proceedings of the Conference on Textile Research." Atlanta: Georgia Institute of Technology, School of Textile Engineering, 1972.

Palmer, Roy A. "Should Textile Mills Be Windowless?" *Textile World* 96:1 (January 1946).

"Russell Fields a Winning Team." *Textile World* 130:6 (June 1980).

"Technical Problems of Reconversion Not Severe." *Textile World* 95:6 (June 1945).

National Register Nominations and Collections Held By Georgia Historic Preservation Division, Atlanta, Georgia

"ATCO-Goodyear Mill and Mill Village Historic District." National Register Nomination. 2005.

"Bibb City Historic District." National Register Nomination. 2001.

"Cabbagetown Historic District." Additional Documentation for National Register Nomination. 2006.

"Chicopee Mill and Village Historic District." National Register Nomination.1975.

"Griffin Manufacturing Company." National Register Nomination. 2001.

"Hawkinsville Commercial and Industrial Historic." District National Register Nomination. 2002.

"Jefferson Historic District." National Register Nomination. 2003.

Lupold, John S. "Spindles and Shuttles, Stones and Sifter, Saws and Stills: in the Empire State of the South, to 1940: An Industrial Context Statement for Georgia." 1994.

Thormann, Mark. "The Architectural Evolution of Textile Mills in Georgia." 2005.

"Muscogee Mills." National Register Nomination. 1975.

"Puritan Cordage Mills." National Register Nomination. 1995.

"Strickland Cotton Mill." National Register Nomination. 2005.

"Swift Mill" Additional Documentation for National Register Nomination, 2010.

Newspaper and Magazine Articles

"$1.3 Million Growth Set." *The Macon Telegraph* May 10, 1967, 10.

"Addition Is To Be Built On Dixie Mills Costing $25,000." *Lagrange Daily News* September 1, 1941, 1.

"Bibb Mfg. Will Close Four Mills in Georgia." *Wall Street Journal* September 7, 1971, 19.

Boring, Bill. "Georgia Ready: State , Primed for Industrial Boom, Faces Changeover With Little Grief." *Atlanta Constitution* August 26, 1945. 9A.

"Burlington Mills' Move to Buy Control of Pacific Mills Is Latest in Trends to Bigger, Varied Textile Firms." *Wall Street Journal* July 12, 1954, 10.

"City Nervously Awaits Closing of Textile Plants." *Atlanta Journal Constitution* January 12, 2004, A12.

"Cotton Causalities: More Mills Close As High Costs, Sagging Prices Pin Them In." *Wall Street Journal* June 10, 1949, 1.

"Georgia Plants Need 62,500." *Atlanta Constitution* August 10, 1944.

Copeland, Larry "Kia Breathes Life into Old Georgia Textile Mill Town." *USA Today* March 25, 2010, 5A.

"Dixie is No Cotton Mill, Makes Nothing But Rayon." *LaGrange Daily News.* September, 1 1950, 1.

Kilman, Scott and Linda Williams. "The New Mill: While Textile Makers Bemoan Imports, They Are Modernizing, Too." *Wall Street Journal* September 14, 1984, 1.

Hemphill, Paul. "Nightfall on a Company Town." *Georgia Trend* (November 1991).

"Many Southern Mills Staying Closed Today as Sales Lag." *Wall Street Journal* April 1957 22, 7.

Montgomery, Jim. "Troubled Textiles: Import Competition Is Only One of Many Woes Facing Fabric Makers." *Wall Street Journal* July 29, 1970, 1 and 22.

O'Donnell, Laurence G. "Textile Mill Profits for 1959 Expected To Show Biggest Return on Sales Since '51." *Wall Street Journal* December, 28 1959, 18.

"Operations of Cotton Textile Industry Seen Near Capacity Output." *Wall Street Journal* August, 12, 1947, 10.

Orr, Eleanor. "Mills, Without Halting, Switch To Making Civilian Goods." *Atlanta Constitution* August 19, 1945, 2B.

Paul, Peralte C. "Thomaston Reweaves A Post-Textile Economy: The Loss of 1,400 Jobs In 2001 A Wake-Up Call For Upson County." *Atlanta Journal Constitution* November 15, 2003, A1.

Riner, Duane. "Textile Revolution May Start Here." *Atlanta Journal Constitution* January 1, 1967, 70.

Sterling Slappey, "From Barracks To Looms: Georgia's Spindles As 225 Soldiers Assist." *Atlanta Constitution* December 29, 1944, 10.

"Textile Mills Built Last Year." *Atlanta Constitution* January 19, 1896, 16.

"Textile Mills Need 2,000 Operatives." *Atlanta Constitution* November 30, 1944, 9.

Wise, T. A. "Textile Markets: Companies Sell Below Cost to Keep Mills Busy; Two More Plants Closed." *Wall Street Journal* February 18, 1952, 5.

Wright, Daniel. "Textile Upturn: Many Sections of Trade Report Pickup Signs After 15-Months' Slump." *Wall Street Journal* June 16, 1952, 1.

"Work Started on New Addition to Thread Mill." *Tallapoosa Journal* January 22, 1948, 1.

Private Collections

Private Collection of Paul Rosenthal, Monroe, Georgia.

Private Collection of Ernie Smallman, Columbus, Georgia.

Sanborn Maps

Sanborn Fire Insurance Map. Walton County, Monroe, May 1924-Januray 1945 update, sheet 10.

Sanborn Fire Insurance Map. Muscogee County, Columbus, 1929-1958 update, vol. 1 sheet 1.

Sanborn Fire Insurance Map. Bibb County, Macon, 1924-Feburary 1951 update, vol. 2 sheet 238.

Sanborn Fire Insurance Map. Jackson County, Commerce, November 1932-June 143 update, sheet 7.

Sanborn Fire Insurance Map. Troup County, LaGrange, May 1930-October 1950 update, sheet 31.

Scholarly Articles

Barkin, Solomon. "The Regional Significance of the Integration Movement in the Southern Textile Industry." *Southern Economic Journal* 15:4 (April 1949), 395-411.

Blythe, Robert W. "Unraveling the Threads of Community Life: Work, Play, and Place in the Alabama Mill Village of the West Point Manufacturing Company." *Perspectives in Vernacular Architecture* Vol. 9 (2003), 135-150.

Davidson, Lisa Pfueller "Through the Mill Documenting the Southern Textile Industry." *Cultural Resource Management* No. 4 (2000).

Johnson, Merrill L. "Postwar Development in the Southeast and the Pioneer Role of Labor-Intensive Industry." *Economic Geography* 61:1 (January 1985), 46-65.

Lovasy, Gertrud. "Rise in U.S. Share of World Textile Trade." *Staff Papers-International Monetary Fund*, 3:1 (April 1953), 47-68.

Muntz, Jr , Earl Edward. "An Analysis of the Man-made Fiber Industry." *The Journal of Industrial Economic*, 7:3 (July 1959), 221-235.

Sharpe, Roger R. "The Growth of the Man-Made Fiber Industry." *Financial Analysts Journal* 20:1 (January- February 1964), 43-48.

Mars, Penelope. "An Economic Comparison of the Textile Industries in the U.S.A. and the U.K.." The *Journal of Industrial Economics* 9:2 (April 1961), 181-194.

Mass, William. "The Decline of a Technological Leader: Capability, Strategy, and Shuttleless Weaving, 1945-1974." in *Business and Economic History*, Second Series, Volume 19, 1990, 234-244 (Paper presented at Business History Conference March 23-25, 1990).

Stanback, Jr. T. M. "The Textile Cycle: Characteristics and Contributing Factors." *Southern Economic Journal* 25:2 (October 1958), 174-188.

Thornblade, James B. "Textile Imports from the Less-Developed Countries: A Challenge to the American Market." *Development and Cultural Change* 19:2 (January 1971), 277-286.

Viscusi, W. Kip. "Cotton Dust Regulation: An OSHA Success Story?" *Journal of Policy Analysis and Management* 4:3 (Spring, 1985), 325-343.

Zeisel, Rose N. "Modernization and Manpower in Textile Mills." *Monthly Labor Review* 96:6 (June 1973), 18-25.

Site Visits Surveys

Site visit and survey of Atlantic Cotton Mills, Macon, Georgia, February 1, 2011.

Site visit and survey of Clarkesville Mills, Clarkesville, Georgia, November 18, 2010.

Site visit and survey of Dixie Mills, LaGrange, Troup County, Georgia, February 3, 2011.

Site visit and survey of Dunson Mill, LaGrange, Troup County, November 16, 2010.

Site visit to Elm City Mills, LaGrange, Georgia, February 3, 2011.

Site visit and survey of Habersham Mills, Habersham County, Georgia, December 9, 2010.

Site visit and survey of Harmony Grove Mills, Commerce, Jackson County, Georgia, February 8, 2011.

Site visit and survey of Kex, LaGrange, Georgia, February 3, 2011.

Site visit and survey of Martha Mills, Thomaston, Upson County, Georgia, November 11, 2011.

Site visit and survey of Mary Leila Cotton Mills, Greensboro, Greene County, Georgia, February 8, 2011.

Site visit and survey of Monroe Mills, Monroe, Walton County, Georgia, January 18, 2011.

Site visit and survey of Mount Vernon Mills, Trion, Georgia, January 17, 2011.

Site visit and survey of Tallapoosa Cotton Mills, Tallapoosa, Haralson County, Georgia, April 12, 2011.

Site visit and survey of Willingham Cotton Mills, Macon, Bibb County, Georgia, February 1, 2011.

Videos

"How Textile Mills are Modernizing," Wolff Studios. General Electric Company 1948. Available at Prelinger Archives. http://www.archive.org/details/HowTexti1948, 2011.