

Eagle and Phenix Mills, 1868  
1200-1300 Blocks of Front Street  
Columbus  
Muscogee County  
Georgia

HAER GA-30

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GA,  
108-COLUM  
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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## HISTORIC AMERICAN ENGINEERING RECORD

THE EAGLE AND PHENIX MILLS

HAER GA-30

Location: Columbus, Georgia. The western side of the 1200 and 1300 blocks of Front Avenue.

Dates of Construction: Mills 1868, 1870, 1878; outbuildings and other construction from 1868 through 1963.

Original Owner: The Eagle Manufacturing Company (William H. Young)

Present Owner: Reeves Brothers, Inc.

Significance: From its inception in 1851 the dynamic growth of the Eagle Mill represented the most important factor in Columbus's industrial development. In 1860 the Eagle Mill absorbed the faltering Howard Factory (1849) and became the town's largest industry. During the Civil War, the Eagle Mills furnished a variety of products to the Confederacy; in April of 1865, federal troops burned both of the factories.

During the next two decades the resurrected Eagle and Phenix Manufacturing Company constantly expanded. Mill No. 1, with a capacity greater than the combined Eagle and Howard factories, began manufacturing in 1868; a slightly larger Mill No. 2 started in 1870; and Mill No. 3--its size equal to No. 1 and 2 combined--started operating in 1878. In 1880 the Eagle and Phenix Mills were the largest producers of textile goods in the South, and during that decade "New South" advocates frequently cited those mills as an example of a successful Southern enterprise.

The Eagle and Phenix eventually dominated the water power lots within the original city of Columbus. Utilizing some of that power, they illuminated Mill No. 3 with arc lights as early as 1880. The electric generators, installed in

1907, 1914, and 1920, still supply a majority of their power requirements, and the dam (built 1882), powerhouses (built 1899-1900), and generators represent the mill's most significant remaining technology.

The Eagle and Phenix suffered both economic and labor troubles during the depression of the 1890s and went into receivership but was revitalized by 1915. From that date until 1947 it remained a stable, locally owned property and continued to operate the northern portion of the mill as a textile finishing plant and the southern half as a textile manufacturing plant.

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(For elevations, see HAER drawings No. GA-33-7, GA-33-8, GA-33-9, GA-33-10, GA-33-11; for site plan and short descriptive statement, see GA-33-12 - Front Avenue Industrial District)

(A view of the Eagle and Phenix cotton warehouse appears in the foreground of the photo in HABS GA-110, Muscogee Mills.)

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## THE EAGLE AND PHENIX MILLS

### ANTEBELLUM AND WAR YEARS

From its inception, the dynamic growth of the Eagle Mill represented the most important factor in Columbus's industrial development. Within seven years it would be the largest company in the town. The driving force behind the expanding company in those years and for the next 40 would be William H. Young.

In 1827, even before Columbus existed, Young visited the Falls of the Chattahoochee and was impressed by its potential water power. As a 20-year-old New Yorker engaged in a mercantile business in Twiggs County, Georgia, he supposedly vowed to return and harness the falls for manufacturing. Later, as a commission merchant in New York and Appalachicola, Florida, he accumulated a fortune, which he invested in industry.

As early as 1849, Young began to acquire Columbus property. At that date, three textile mills already operated within the city, and the still-empty six-story brick factory of Farish Carter, a wealthy planter from Milledgeville, was potentially operable (see the HAER Water Power Development at the Falls of Chattahoochee report for more details on these antebellum factories). Young's agents unsuccessfully tried to purchase the Carter building, and Young bought three lots and the accompanying water rights from the Columbus Water Lot Company. He organized the Eagle Manufacturing Company in 1850 and invested half of the \$100,000 capital (later expanded to \$140,000), while 11 other stockholders split the remainder. R. M. Gunby, a local merchant and the brother-in-law of Young's wife, served as president of the company even after Young moved to Columbus, apparently to be closer to his new investment, in 1855. The next year he became president of a local bank and an insurance company, illustrating both his wealth and his diversified economic interests. [1]

In 1851 construction began on his Eagle Mill, a brick structure (150 x 50 feet) with four stories and a basement (E&Ph Photo 2). Its production equipment included 5,000 cotton and 1,300 wool spindles (throstle frames) and 170 looms, all of which consumed 1,500 bales of cotton and 100,000 pounds of wool per year. The factory used steam for the processes requiring heat, and the production of that energy consumed 200 cords of wood each year. In addition, the factory utilized each year 1,000 gallons of spermaceti oil, 500 pounds of lard, and 350 barrels of flour for sizing. J. Rhodes Browne originally installed the machinery within the mill. After acquiring some knowledge of textiles during an apprenticeship in Rocky Glen, New York, he installed mill equipment in Salisbury, North Carolina. He stayed in Columbus as superintendent of the Eagle Mill and later became a successful

entrepreneur. [2]

The Eagle's workers apparently came from the local area, since the mill advertised for labor in the Columbus Enquirer, and they probably were mostly "cracker girls" (poor white from the country). They received free housing; female operatives averaged about \$10 in wages per month, while the males who performed more skilled tasks averaged about \$20 per month. [3]

From the start, the operatives at Eagle Mill produced a wider variety of goods than most Columbus, or other Southern, mills. They manufactured cottonades, Negro kerseys, planters' cashimers, truck for trousers, comforters, batting, sewing thread, and wrapping twine. The company boasted that its product was heavier, made of better cotton, and cheaper than anything being sold in New York, but its products sold primarily within the region. Successful marketing represented the key factor in the company's early prosperity. Young's experience as a commission merchant guided him in developing the diversified product line, and his connections throughout the area helped him in selling it. Company dividends of 20% to 25% during the 1850's reflect his ability as a salesman. [4]

By 1857 this dynamic company occupied a dominant position among Columbus industries. In that year the Eagle Mill, rather than any of the other companies with which it shared the raceway of the existing dam at the site, extended the dam (which had originally reached only 500 feet) all the way to the Alabama shore. The youngest of the five companies which utilized the race implemented this improvement of the water power (see HAER Report, Water Power Development at the Falls of the Chattahoochee, for details of the dam construction at the site). An additional impetus for making this modification came from an 1855 U.S. Supreme Court ruling that gave Georgia ownership of the river to the extreme high water mark on the western bank and denied Alabama any riparian rights. [5] In 1860, in an action characteristic of a prosperous growing concern, the Eagle Mill purchased the faltering Howard Factory, its northern neighbor along the race.

Construction on the Howard Factory, the third textile mill established within the town, had begun in August of 1847 with an impressive ceremony underscoring the community's commitment to manufacturing. Colonel Van Leonard, James Carter Cook, E. T. Taylor, Harvey Hall, J. L. Ridgeway, and Sterling F. Grimes provided the \$100,000 capital for this enterprise. The six-story building (125 x 48 feet) came slowly into production with its 5,000 spindles, 143 looms, and 100 operatives producing 15,000 yards of osnaburgs and sheets each week and from 400 to 500 pounds of thread. They marketed these goods primarily in Georgia and Alabama, with some customers in Tennessee, Louisiana, Mississippi, St. Louis, Philadelphia, and New York. They sold their waste products in the last two cities, and some of their transactions in those northern

cities dealt with commission merchants to whom the Howard Factory owed money for machinery. The company apparently never earned its anticipated 20% dividends. It changed owners in 1854, before Young purchased the mill in 1860. With that acquisition the Eagle Mills became the second largest textile factory in Georgia, with \$375,000 capital invested, 11,300 spindles, 282 looms, and 500 workers. [6]

As in the case of smaller Columbus industries, the Civil War greatly increased the demand for the products of the Eagle Mills. In the fall of 1860, even before the war started, military companies in Georgia, Alabama, Florida, and Tennessee ordered the company's fabrics. By 1862 its daily production included 2,000 yards of heavy gray tweed for uniforms, 1,500 yards of cotton duck for tents, and \$1,500 worth of cotton "stripes," osnaburgs, sheeting, yarn, and thread. In addition, each week the factory manufactured 1,000 yards of India rubber cloth for overcoats and 1,800 pounds of rope. Three-fourths of its goods were purchased by the government.

To meet the increased demand, the mill ran night and day, utilizing 12-hour shifts, and therefore employed additional workers. These laborers, drawn from the farms, were attracted to the relative prosperity of Columbus as the inflation and other economic hardships of the war became progressively more unbearable in rural areas. [7]

The war also increased the dividends of the 12 stockholders of the Eagle Mills. The company tried to avoid the appearance of war profiteering, perhaps because of Young's Northern background or in an effort to avoid confiscation by the Confederacy. Its prices to the government were about one-half the retail market value, and it purchased \$1,000 of Confederate bonds each month. In an effort to aid Columbusites in general, it retailed its goods from the office, again for one-half price. In addition to contributions to the destitute, which amounted to \$5,000 in 1864, Eagle funds built a school for 150 to 200 poor children--the first free school of any size in Columbus. At the end of the war the company was erecting a new \$100,000 school. [8]

The conflagration set by federal troops in April of 1865 consumed both the school and the Eagle Mills. In their first meeting after the destruction, the directors of the corporation decided to sell their property at public auction. Judging from Young's actions before and after that date, he probably had no intention of relinquishing control of the company. With its buildings in ruins, it still possessed many assets: managerial skills, its old market, plenty of operatives, and the thundering power of the Chattahoochee. Even without the fire, most of the machinery, which had run continuously during the war, would have needed replacing anyway. The sale represented an effort to attract outside capital.

The property offered for sale indicated the size of the firm in

1865. On the Columbus side of the mill the company owned 11-1/2 water lots (8 of which had water privileges), 3/4ths interest in the Water Lot Company which controlled 18 of the 19 total waterfront lots, and 3 brick and 2 wooden boarding houses (216 rooms) for operatives. In Alabama it possessed 10 lots on the river, 9 in the city of Girard, and 26 acres of land containing 40 workers' houses. [9]

On December 14, 1865, a bid of \$100,000 purchased the land for three men: H. J. Bussey, a Columbus cotton factor and an agent for Young; E. Waitzfelder, a manufacturer from Milledgeville, Georgia; and William Gregg, the South's most prominent antebellum manufacturer. Young still controlled the company. Gregg died on 13 September 1867, and Waitzfelder's name quickly disappeared from the list of officers. Bussey acted as President, and most of the other directors had also served before the war. Joining Young and Bussey as an active manager was G. Gunby Jordan, a nephew of the pre-war president R. M. Gunby. [10] Jordan came to Columbus after serving in the war and rapidly became the town's most dynamic young businessman.

#### A "NEW SOUTH" MILL

In early 1866 the reorganized company optimistically added "Phenix" to its name, symbolizing that it would rise from its own ashes as had the mythical bird. As a more concrete indication of solvency, the company reimbursed old Eagle stockholders for the old securities at their par value in four quarterly payments. Such actions produced confidence in the organization, for by April of 1866 capital stock subscribers totaled over \$400,000 and a year later exceeded \$500,000. [11]

These funds financed a facility that from its inception was planned as a first-class operation. Erected on the site of the original Eagle Mill, the capacity of the new Mill No. 1 was greater than the old Howard and Eagle Mills combined. The building proceeded slowly. During 1866 former operatives cleaned the burned bricks. In early 1867 actual construction began, the roof being laid in May and June and the interior completed in 1868.

Captain William J. McAllister, an officer of the company, supervised the work on this five-story brick structure (204 feet x 56 feet 9 inches) that incorporated typical 19th-century slow-burning mill construction (E&Ph photo 2). A stairtower topped with a colonnaded bell tower adorned its front or eastern end (photos 3, 4), while on its western end an attached wooden power house extended over the raceway. The building contained over 400,000 linear feet of lumber (in 20- and 24-foot lengths), not including the structural beams and columns. Smaller separate buildings, erected at the same time, housed the picker room, the drying facilities, and the machine and carpenter shops. [12]

Unlike other southern mills reconstructed at that time, the Eagle

and Phenix directors purchased all new machinery. Some equipment came from the North, but most of it came from English manufacturers. When William Gregg refurnished his South Carolina factories at the end of the war, he found northern machinery unsuitable and bought his in Europe. Apparently Young followed the same pattern. The cards, spinning frames, and looms were slowly placed in what the local press labeled as an immense factory, and gradually it phased into operation. The newspaper and town in general eagerly followed the progress of its most important industry, and the company officers seemed quite willing to keep the public informed. For example, they invited everyone to the trial of their new fire pumps. More importantly, the company began manufacturing rope in January of 1868 and yarn by February, when four looms also began weaving. The mill produced its first cassimere in August, and all of its 10,000 spindles and 135 looms began operating in October of 1868. Within the new mill the wool room and finishing department occupied the basement, carding the first floor, weaving the second, spinning the third, and dressing and beaming the fourth. [13]

The demand for their products must have been excellent, for after operating only four months the directors resolved to build another mill on the site of the old Howard Factory. Other factors influenced that decision. Hundreds of unemployed workers still lingered in the city, and some of the company's housing remained empty. All of the auxiliary facilities for Mill No. 1, including machine and carpenter shops, the dyehouse, warehouses, and the sale force, could easily support an additional factory. By 1869 the company even ran its own cotton gin, thereby eliminating the baling step and probably insuring a cleaner raw material less likely to ignite a fire during the picker process. In 1869 the company built a new dam to insure ample power for the two operations. [14] (See Water Power Development Report for more details.) The continued expansion of the Eagle and Phenix seemed a logical, almost reflexive step.

In order to finance the expansion, the company increased its capital stock from \$500,000 to \$1,250,000. It experienced a heavy demand for its stock; \$63,000 worth of stock sold in one day, and Young testified that \$200,000 or \$300,000 more could have been subscribed. Investors were mostly Columbusites and Georgians. An 1870 list of stockholders revealed that Columbusites owned 33% of the stock, Savannahans 12%, other Georgians 23%, Alabamans 13%, other Southerners 40%, and New Yorkers 13%. Their dividends never reached the pre-war 23% level but averaged between 6% or 10%. By 1883, 100% in dividends had been paid since 1869. [15]

Using the new capital, construction on the new factory began in 1869 and continued in 1870. Mill No. 2 (214 feet 5 inches x 57 feet 7 inches), though slightly larger, resembled its predecessor except that it lacked a belltower on its front stairtower. (E&Ph photos 5, 6, 7, 8, 9, 10). The new plant began operating in 1871 as a separate entity with its own picker house, carding on the first floor, weaving on

the second and third floors, spinning on the fourth, dressing and beam-  
ing (and eventually slashing) on what must have been an incredibly hot  
fifth or top floor. The new mill utilized shafting from the pre-war  
factories, suspended from hangers fabricated in Columbus. The new mill  
housed almost twice as many looms (350) as did the first, and they  
produced higher quality material. Young traveled to England to pur-  
chase the 1 x 4 box 36" Thomas, 2 x 1 and 3 x 1 Thomas Wood, 2 x 1 box  
Bridesburg, and 1 x 4 and 2 x 1 box clipper looms. The company also  
imported 58 women as weavers. [16]

Those weavers, who seemed arrogant to the Eagle and Phenix  
managers, quickly alienated their employers, and most of them left  
Columbus within a year. That experience reinforced the company's  
preference for local labor. In general, its labor policies were pro-  
gressive but paternalistic, as might be expected of a large-scale  
operation. Its attempt to develop a sense of company loyalty among its  
operatives strongly resembled a primitive form of welfare capitalism.  
Most important to the operatives, the company paid higher wages (from  
\$.05 to \$.25 more per day, depending on the skill) than other Columbus  
mills. Overseers of its various departments received stock in the  
company. In 1873 the Eagle and Phenix opened a savings department for  
its operatives; 10 years later, 1,030 people had \$1 million deposited  
there. One laborer saved \$9,128.95. While this benefited the workers,  
the company was able to use the money, according to Young, for "quick  
capital." During the 1870's their annual picnics, preceded by a rail-  
road trip to Fort Mitchell, Alabama, were real extravaganzas.

The objectives of the company's benevolent policies were to attract  
the best local operatives, to reduce labor turnover, and to develop a  
permanent work force, thereby producing a more stable, efficient  
operation. Many of their operatives grew up in company houses as they  
moved up through the organization. Their villages on the Alabama side  
of the river were called Brownesville or MacAllisterville, after  
officers of the company, before the name Phenix City was adopted.  
Starting at age 10 and working as spinners, children earned \$.25 per  
day. If they learned the proper skills, they could eventually make  
\$1.50 per day as weavers, most of whom were women. In 1880, 54% of  
their operatives were women and 13% were children. The system functioned  
so that the company usually did not have to rely on potentially recalci-  
trant outside labor. [17]

The products made by those operatives must have been of excellent  
quality, and the variety was incredibly large: osnaburgs, sheeting,  
drilling, stripes, solid colors, shirting, ticking, awning cloth,  
checks, gingham, blue and brown denims, five types of cottonades,  
woolen cassimers, twills and tweeds, yarns, sewing and knitting tweeds,  
wrapping twine and rope, and their most unique and successful product,  
cotton blankets. A country store could replenish its entire stock from  
the Eagle and Phenix. Initially, after 1868 the company marketed its

products, as it had before the war, by selling them locally. By 1870 falling prices forced the directors to send agents to the West and Northwest, where they successfully competed with northern producers. The panic of 1873 forced them to reduce prices, but they still were able to sell their goods. [18]

During the depression of the 1870's, the Eagle and Phenix and other Columbus textile mills reduced hours and wages, but none went bankrupt. Plans for at least three new mills were stopped. Even before the national panic, the failure of a local bank contracted local currency, and the Eagle and Phenix became the area's chief banking institution. To help relieve the situation, the Eagle and Phenix offered to issue \$300,000 in certificates, scrip, or "shinplasters," backed in part by the company's savings department. Their workers were paid in that medium, 40 merchants and businessmen in the city agreed to accept it, and Eagle and Phenix currency was exchanged for all cotton brought to Columbus that fall. In October of 1873 a New York trading house advertised in a Columbus newspaper for \$100,000 of Eagle and Phenix money to be exchanged for dry goods.

Since the company issued currency, it could be taxed by the federal government as a banking institution under a law designed to force state banks to become national banks. The tax, calculated not merely on the currency in circulation but on its entire capital stock, amounted to \$28,000 by 1878. The U.S. Congress, after the appropriate lobbying by Gunby Jordan and others, passed a bill relieving the company of the tax. [19] The importance of this to the mill was reflected in the intensity of the lobbying campaign, and in the polarization of Columbus's political and business community around the issue. [20]

Neither the depression nor political opposition stopped the Eagle and Phenix from growing. In 1873 its directors decided to use some profits to build a third mill, doubling the company's capacity for the second time since the war. John Hill, the company's engineer, who came to Columbus from Illinois in 1872, supervised the construction of the large mill No. 3 (300 x 80 feet). In order to have more water power, he erected it south of the existing buildings, on the site of Palace Mills, a gristmill that had burned.

After blasting 75,000 cubic feet of granite for the foundation and raceway, seven derricks hoisted rocks for foundation walls. The new structure resembled the older factories except for its twin stairtowers on the east and west sides in the middle of its length (E&Ph photo 11). The five-story plant used 3,000 cubic feet of stone, 2.5 million of brick, and 1.5 million square feet of lumber. The scale of construction attracted a great deal of attention, and when the masons began laying bricks they painted a sign that read: "300 feet long. Please don't ask any more questions." [21]

Hill also traveled to the Northeast to select the machinery for the new operation. In later testimony he asserted that mill No. 3 "was the only cotton mill of any consequence being built in the United States" during the depression, and this gave him an advantageous position in dealing with equipment manufacturers. Without paying any additional money, Hill custom-designed all the machinery to fit exactly its proposed function. Saco Water Power Company provided the yarn preparation equipment, 160 cards and 20,000 spindles, all ring spindles except for six mule spinning machines with 804 spindles each (E&Ph photo 12). Crompton supplied the weaving capacity, consisting of 500 four-shuttle check looms (probably 350 4 x 1 box side lever harness motion Crompton gingham looms and 150 4 x 1 underneath harness motion Crompton looms) and 150 12-harness fancy looms (E&Ph photo 13). As in the case of the other two mills, the entire process, from picking to weaving, was housed in the new facility and its outbuildings. [22]

Designed from its inception as an efficient, modern plant, it almost exclusively manufactured colored and fancy materials, which at the time retailed for twice as much as white goods. Other innovations seem to have been suggested or prompted by the very modernity of the new mill. In 1880-1881 Hill installed direct-current Brush arc light in Mill No. 3. Only one year earlier (1879), Charles Brush had developed the dynamo that made his lights feasible on a large scale for the first time. Supposedly, an Eagle and Phenix official conferred with Brush during a visit to the Philadelphia Exposition of 1876. The Eagle and Phenix was among the first industrial users of electric lighting. [23]

The extremely early application of electric industrial lighting replaced gas illumination and was so successful that the company installed electric lights in the weave rooms in Mills No. 1 and 2 and the wool department by 1885 (E&Ph photo 14). Apparently weavers used their lights early in the morning and late at night, especially in the winter, and this new method of illumination did not immediately produce regular day and night shifts. During periods of low water, the mills ran 24 hours per day with a reduced load to maintain production; this simply reflected the lack of pondage behind the Eagle and Phenix dam. The increased demand for power necessitated by the 300-foot-long Mill No. 3 and the electric dynamos led the Eagle and Phenix in 1882 to replace the wooden dam with the present stone one (see HAER report, Water Power Development at the Falls of the Chattahoochee, for a description of the dam). Major D. W. Champayne, who built the Georgia state capitol building, supervised construction of the dam, which had been designed by Hill. [24]

Hill was probably most responsible for the success of the company in the late 1870's and 1880's. Young provided the capital and the marketing abilities in an earlier period, but Hill's mechanical genius designed its modern facilities and innovative new equipment. Bothered by the memory of the burning of his father's uninsured textile mill in

Illinois, Hill directed his talents toward fire prevention. He developed an effective automatic fire sprinkler and installed some in the Eagle and Phenix, where they successfully functioned during tests and actual fires (E&Ph photos 15, 16, 17). The Neracher-Hill Automatic Sprinkler Company manufactured and marketed these fixtures. This firm later combined with a New England organization to form the General Fire Extinguisher Company, now the Grinnell Corporation. He also developed a fire alarm (E&Ph photo 18). Hill served as the engineer superintending construction of the John P. King Mill at Augusta, which resembled Mill No. 3; the Lane Mills at New Orleans; and the State of Alabama mills at Springer, Alabama.

Both the company and the Columbus newspapers, which always encouraged industrial growth, were proud of Hill's new factory at the Eagle and Phenix. They labeled it the largest textile plant in the South. Visitors were surprised by the industrial progress of the city and especially by the size of the Eagle and Phenix. Particularly during the Atlanta Exposition of 1881, knowledgeable textile men, including George Draper, found their way to Columbus and were impressed by Mill No. 3. One English manufacturer pronounced it "as perfect in all its appointments as any establishment in the world." A Mr. Lockwood of Massachusetts declared, according to Young, "No mill in the world can beat it for the economical manufacture of the style of goods for which it is gotten up." [25]

The late 1870's and 1880's represented the most significant period in the history of the Eagle and Phenix. Measured by the 1880 Manufacturing Census, the value of the product of the Eagle and Phenix (\$1.5 million) was greater than that of any other textile mill in the South. Only two counties in the region (those containing the Augusta and the Graniteville, South Carolina, complexes) turned out more cotton and woolen goods than this single company. Ironically, its success at that time stemmed in part from the fact that it had burned in 1865 and all new equipment had been installed. [26]

The Eagle and Phenix had a tremendous impact on Columbus. Mill No. 3 added another \$600,000 per year to the city's economy, but its significance transcended the city. During the 1880's, when "New South" journalists were trying to attract northern capital to the region, the Eagle and Phenix represented an excellent example of a successful factory built with southern capital and staffed by local labor, usually labeled as tractable because they had not participated in the national strike of 1877.

Outsiders were aware of the Eagle and Phenix experience. Its products won prizes at fairs in Macon, Augusta, New Orleans, St. Louis, and Cincinnati, and at the Atlanta Exposition of 1881. The Atlanta Constitution, the Charleston News and Courier, the Augusta Daily Chronicle and Constitutionalist, the Manufacturers Record, and the

Textile Record ran articles discussing its success. As early as 1876, Bussey advised the entrepreneurs establishing the Atlanta Cotton Mill, one of that city's first major textile operations. John P. Hill designed and supervised the construction of the King Mill, Augusta's largest textile factory. [27] While the size of the Eagle and Phenix and its near monopolization of local labor and water power might have kept outside investments from entering Columbus, its success probably attracted northern money to many other southern manufacturing sites. The Eagle and Phenix helped to give some substance to the rhetoric of "New South" advocates during the cotton mill crusade of the 1880's. [28]

According to the Textile Record in 1892, "Georgia, the Massachusetts of the South, boasts of some of the largest cotton mills south of Mason and Dixon's line and towering above all of them are the mills of the Eagle and Phenix Manufacturing Company." It so impressed the writer that he offered a detailed description of the "mammoth plant" (E&Ph photos 19, 20) as it looked from the south to the north. Mill No. 3 dominated the southern end of the property; attached to its southwestern corner, the electric house contained the Brush dynamos.

The adjoining building in the rear [to north] of Mill No. 3 is divided into two parts. In the portion fronting on the river, more weaving is accomplished on the first floor, the second floor is devoted to picker machinery and the third is called the blanket room. In the east end of the other portion of the building, on the first floor, is located the carpenter shop, the west end of the same floor being used for wool finishing. The second story is occupied by weaving machinery.

Connected with this building by a bridge [was Mill No. 1, which functioned the same as it did in 1868]. Two smaller buildings are located in the rear of Mill No. 1, the one nearest the river being equipped with picking, spinning and carding machinery, with an attic used for storage purposes. The other is occupied by a machine shop in the western end for more than half its length, the attic above the latter being used as a wool-mixing room. In rooms adjoining the machine shop are wool pickers and cotton gins.

Mill building No. 2 stands in the rear of these [with its various operations in the same locations as they were in 1871]. Paralleling this [building] on the north side stands a long narrow building, the western end fitted with picking machinery and the rest used for storage purposes. The dye-house is the last of the building to be seen of the river front. In the latter end is the bleaching department, in the adjoining room the wool-dyeing is accomplished, while fancy dyeing is conducted in still another department. These three rooms are under one story, but the eastern end of the building

is three stories high. The indigo dyeing is done on the first floor, the remaining stories being used for dye-stuff storage and drying rooms. In the buildings along Front Street are located the boiler house and dry rooms. The building north of the smoke stack is used for offices and storage. The two smaller buildings north of this are storage and waste houses respectively, the former two stories high, while at the extreme upper end are three immense cotton warehouses, numbered 1, 2, and 3.

Except for the additions made to No. 3, the Front Street facade of most of these buildings remained unchanged until the present.

The "mammoth" Eagle and Phenix weathered the financial slump of the 1880's as it had the Panic of 1873 and its aftereffects, but the company, like many others throughout the nation, went into receivership during the turbulent, depressed 1890's. In addition to the generally weak economy, labor disputes, some technological obsolescence, and perhaps some mismanagement all plagued the company. By the late 1880's the company's officers had changed somewhat. William H. Young still remained and served as president from 1883 until 1891. Without any doubt, Young's genius as a marketer and a raiser of capital represented the single most important factor in building the Eagle and Phenix. However, in the period after the war, Young left the day-to-day management of the company to others. N. J. Bussey and G. Gunby Jordan were the most active supervisors, but Bussey died in 1883 and Jordan left the company in 1885 to devote full time to promoting and supervising the building of two railroads from Columbus. After that and only with great reluctance did Young become the active president. [29]

The company expanded its physical plant very little from the early 1880's until 1895. In 1888 they installed a modern continuous chain dyeing system and built covered iron bridges to connect the top floors of the three major mills (E&Ph photo 20), and in 1894, 5,100 square feet of space were added to the wool department. Routine replacement of carding, spinning, and weaving equipment and belting and shafting continued, the flumes were rebuilt, but the company's expansion failed to match its earlier pace. [30]

In 1886 Young asked the directors for authority to build a fourth mill with the same capacity as Mill No. 3 in Alabama, across from the existing factories. Apparently his proposal met opposition and was never mentioned in the Annual Reports again. Instead of the Eagle and Phenix utilizing the proposed site, Young's sons built the Chattahoochee Knitting Mill there (E&Ph photo 21). Production started in 1886 with 13 knitting machines, and in 1890, according to the Textile Record, the owners intended to install 200 automatic knitting machines; by 1896, however, only 80 operated. Evidently this company bought its land and perhaps some machinery, and possibly borrowed some cash from the Eagle

and Phenix, for the knitting enterprise became indebted to the larger company. [31]

The Eagle and Phenix began having financial difficulties as a result of the downturn in the economy in 1890, not due to the loans to Chattahoochee Knitting, but because of its savings bank. In 1891 depositors began demanding their money, because of the hard times and a lag in Eagle and Phenix sales. The situation resembled a run on a bank. The Eagle and Phenix could not provide all of the money on demand.

In order to cover the money deposited in the savings bank, the company issued \$1 million first mortgage, 6% 30-year gold bonds, the company's first bonds. At the same time, Young unsuccessfully fought a group of Atlanta investors led by Judge John Bigby who gained enough proxies to take control of the company. Young and Hill left the company. Bigby became president. The Eagle and Phenix then foreclosed on the Chattahoochee Knitting Company and also forced Young and his family to sell their Eagle and Phenix stock to cover the debts of the smaller company. [32]

The company's problems were only beginning. The nation's most severe depression until that time struck in 1893, and Columbus felt its impact. Once again the company issued scrip, and the company's attempt at financial stringency led to the first major strike in both Eagle and Phenix and Columbus history. In April of 1896 the company reduced by 10% the wages paid weavers for the production of two styles (New Era and Rescue plaids). Management argued that they paid 3% more than other Columbus mills and 16% more than factories in the Carolinas. The weavers held secret meetings and sent a grievance committee, which management refused to receive. During the lunch period on 28 March 1896 a large crowd gathered in the mill's courtyard. Once again a few workers tried to question the managers. Unsatisfied with the answer, they walked out, taking about 300 workers with them. The next day the mill closed.

President Bigby blamed the strike on Eugene V. Debs, a prominent national labor leader and socialist, who had given an address in Columbus a month earlier. At the time, the Enquirer had reported that Debs opposed strikes. "The supreme conservatism of his remarks comprised the surprise, and absence of any display of oratorical ability was the disappointment." [33] Bigby apparently needed a scapegoat, and Debs was convenient.

The timing of the strike was disadvantageous to the strikers, since the company was already having trouble marketing its products. Management refused to compromise, and not until May 11 did a small spinning operation resume. By that time most workers (including the weavers) were ready to return to work at the reduced wage. Management issued a

somewhat face-saving statement that normal wages would be restored when economic conditions permitted.

The strike sparked increased union activity in Columbus, and during the 1890's Columbus became one of the centers of union organizing within the South. The striking weavers formed a local union of the National Union of Textile Workers (NUTW), becoming the first southern local of that American Federation of Labor affiliate. By the end of the summer, four more groups of Columbus workers organized into craft unions: the loom fixers, the carders and spinners, the dressers and finishers, and the dyers. The president of the AF of L, Samuel Gompers, was concerned with expanding into the South, since he was fighting the socialists for control of his union and needed additional local unions who adhered to his trade unionism philosophy. Even though a small Socialist Labor party was organized in Columbus, most Columbus unions supported Gompers, and an Eagle and Phenix weaver, Prince W. Greene, served as president of the NUTW from 1897 until 1900. Under Green's leadership the union spread to other major textile cities in the South: Augusta, Columbia, and Danville, Virginia. Although no major confrontations occurred in Columbus, the union rashly struck over petty issues in other southern cities, and management destroyed it by 1905. After that date Gompers once again controlled the AF of L and did not need to spend the tremendous amount of money it would have taken to unionize the South. [34]

#### TURN-OF-THE-CENTURY MODERNIZATION

Even though the Eagle and Phenix won its 1896 battle with organized labor, that controversy contributed to its economic weakness. On June 14, 1896, it went into receivership; two sets of receivers were appointed, one by a federal judge and the other by the Muscogee County Superior Court. In the end, the federal court took precedence, and G. Gunby Jordan and James W. English became its receivers. The court action stemmed from petitions by some of the company's bondholders who feared that the assets of the company were being dissipated by its present managers. The bondholders charged that the company paid unrealistically high dividends and that Bigby raised his salary in 1896 from \$10,000 to \$20,000. The receivers determined the company's debt to be \$1,178,673.49. [35]

Apparently some Columbusites realized the true financial condition of the Eagle and Phenix. According to the 21 June 1896 Columbus Enquirer: "Everybody knew that this great cotton mill company was not prosperous" and more important "has had a considerable effect in keeping other enterprise from being established here." The newspaper hoped the problems would be corrected quickly.

Two years of litigation, however, followed the establishment of receivership, and it finally ended when the federal court sold the

company at auction on 7 June 1898. A committee of the company's bondholders bought the property for \$500,001--one dollar above the upset price--and assumed obligations amounting to almost \$300,000. Those bondholders in the pool received the property, and the other bondholders realized about 25% of par value for their securities. On the same afternoon as the sale, the new Eagle and Phenix Mills Company organized; it issued \$6,000.00 in capital stock that day, and its directors selected G. Gunby Jordan as president. George Woodruff, a prominent Columbus businessman, served as a director, and within a year Major J. F. Hanson and Hugh Comer, the organizers of the Bibb Manufacturing Company, also acted in that capacity. [36]

Both in his role as receiver and as president of the company until 1915, G. Gunby Jordan's primary objective was the modernization of the mills. Obviously, such changes made the mill more profitable, but beyond that end Jordan took real pride in having an efficiently run operation. Initially, he made very candid criticisms of the mills which he had helped to create 20 years earlier. To him, the four mills' operating as separate units was irrational and uneconomical. On several occasions he at least toyed with the idea of abandoning the entire site, but in the end he continued to run the mills separately and just tried where possible to integrate those similar operations occurring in different structures.

By 1896 much of the Eagle and Phenix's machinery was obsolete. When Jordan took the company over, he allegedly went through the mills with a sledgehammer smashing the out-of-date equipment. [37] In addition to age, some operations were obsolete because of changes in marketing. The first three mills were designed to supply a wide range of products to retailers who sold to women making their families' clothes. Even by the 1870's the market was changing, but it probably came more slowly to the South and other rural areas. By the turn of the century, however, the entire nation was shifting to "ready made" clothing purchased from a mail-order catalogue or from a department or a retail clothing store. [38] For the Eagle and Phenix these changes meant a mill would have to be able to constantly adapt its product line.

In the long run, "ready made" clothing and style changes expanded the volume of business for textile, but at the turn of the century it intensified the problems of a large, almost bankrupt company operating with obsolete equipment. The machinery installed in Mill No. 3 in the 1870's had been perfectly suited to manufacture "country store" plaids and stripes, but people no longer wore those styles by 1900, and the equipment had been installed with little thought to flexibility. Jordan was concerned with Eagle and Phenix's old fashions. In 1913 the company's treasurer toured their markets and reported that their plaids and kimono styles were old while their cottonades were "dead." As a result of his investigation, the sales force eliminated 80 styles. [39]

These changes represent one reason for the constant modification and revitalization of the operation by the new management between 1895 and 1915. In 1900, Mill No. 3 was expanded to the east, filling an unoccupied corner of the property (compare E&Ph 19 with photos 22, 23). The boiler room received an additional smokestack (E&Ph photos 23, 24, 25). A great deal of machinery was replaced or modified: 40-inch revolving flat cards replaced the old cards in Mills No. 2 and 3, some spinning frames were enlarged, and at least 123 of 183 looms were replaced in No. 1 and 333 of the 380 looms in No. 2 (see Appendices I and II, 1896 and 1905 inventories). Those new looms superceded the English looms installed when the mills began operating. Crompton manufactured the various types of new looms, 37-1/2 inch 4 x 1 and 2 x 2 box with speeds of 150, 156, and 165 picks per minute.

The Eagle and Phenix participated in the most significant technological shift in textiles during the period: the adoption of automatic looms. By 1905, Mill No. 3 contained at least 328 Draper looms with 144 identified as the model "E" (introduced in 1898). The other 184 might have been model "A"s--the first automatic looms, first sold in 1895. The expansion of Mill No. 3 might have been made to accommodate this new type of loom. By 1913 the Eagle and Phenix operated at least 328 automatic Draper "E" or Northrop looms and possibly 498 automatics, or between 20% and 30% of their weaving capacity. Throughout the South in 1914 approximately 50% of the looms were Northrop looms, so the Eagle and Phenix lagged in that respect. The automatic Draper, however, wove plain material, and the Eagle and Phenix still produced more patterns. In regard to automatic gingham looms, the Eagle and Phenix revitalization came a few years too early. In 1905 the company bought 388 37-1/2-inch "modern Crompton and Knowles looms" which could not possibly have been automatics. Crompton and Knowles produced their first automatic looms that year, and the Eagle and Phenix records fail to identify those looms as automatic. By 1913, company officials refer to the new Crompton and Knowles non-automatic looms as being obsolete, and they purchased 36 new automatic ones. Modernization of the weave rooms also included replacing the arc lights with incandescent lamps. The former cast deep shadows and made it hard for weavers to detect imperfection. [40]

In 1905, the mill superintendent, Oscar Jordan, Gunby's brother, also modified the opening room for Mill No. 3, created a "colored mixing room" for raw stock dyeing, and built a new waste house by converting old lappers into waste materials. These changes represented typical activities during the Jordan management.

The new managers also changed the name of the Chattahoochee Knitting Company to the Girard Mill, converting its operation from knitting to cotton weaving and its power supply from a steam engine to electricity. As in the case of the Georgia mills, the Girard plant included all the manufacturing stages. This mill, however, ran only "one class of goods" and was more successful than the others. In 1905,

Oscar Jordan lengthened the quills which held the filling from 6 to 7-1/2 inches so that the looms ran longer between changing the quills. At the same time the price per cut paid the weavers was reduced, since they could operate more looms. Most of the weavers walked out on 17 March, but by 7 April they had returned, thereby accepting the larger quills and lower rates per cut. Management claimed that the weavers would still earn more money. In this case the Eagle and Phenix tackled the same problem the automatic loom might have solved, without scrapping their old looms.

The larger quills represented one of the company's attempts to deal with the labor shortage, particularly the lack of skilled weavers, that existed in Columbus at that time. Between 1898 and 1906 at least four new textile mills (Columbus Manufacturing, Bibb, Swift Spinning, and Perkins Hosiery) started within the city. In 1902, 300 of the Eagle and Phenix's looms stood idle. They raised wages, but, according to superintendent Jordan, that meant operatives earned the money they needed in fewer days and refused to work a full week. His solution was to support the Georgia Immigration Association. By 1908 he reported a steady increase in employment. [41]

#### LATER WATER POWER AND HYDROELECTRIC DEVELOPMENT

In addition to difficulties with old style patterns, obsolete equipment, and a labor shortage, the company experienced problems with its most important asset: its water power. Between 1869 and 1920 the company progressively modified its method of deriving power from the river, in an attempt to overcome water power insufficiencies. In 1869, in conjunction with the building of Mill No. 2, the company reconstructed the dam using bed timbers firmly bolted into granite rocks and rebuilt a massive rock wall separating the river from the tail race (E&Ph photo 26). They converted it to a rubble masonry dam in 1882. The wheels which drove Mills No. 1 and 2 were north of the dam, and water entered their wheelpits through wooden flumes spanning the tailrace. The turbines at the rear of Mill No. 3, below the dam, were fed water by a wooden flume, which was later supported by stone arches (E&Ph photo 27). This arrangement was inefficient. The water entering the flumes for Mills No. 1 and 2 had to make a hydraulically inefficient 90-degree turn. [42]

In 1899-1900, in an attempt to provide more efficient power, two wheelhouses or power houses were erected in the river, west of the former race, and employed shafts (probably 9 inches in diameter) to transmit power across the old raceway. Fed by its own raceway, the lower wheelhouse (E&Ph photos 28 and 29), directly opposite Mill No. 3, contained two 45-inch and two 48-inch Holyoke Hercules turbines, which drove two shafts entering directly into the mill (E&Ph photos 30 and 31). The generators in the electric house south of the larger mill were probably driven by belting or ropes running from the lower shaft in the basement of Mill No. 3. A fifth 48-inch turbine was added later.

Twelve-foot flumes fed water to these wheels, which just sit inside the flume with no means of further channelizing the flow into the turbines (E&Ph drawings 8 and 9; E&Ph photos 32, 33; see also photo 34 for original blueprint plans of the lower power house).

In the upper wheelhouse, four 54-inch Holyoke Hercules turbines stood in open wheelpits, with two headgates on the northern side and one on the west drawing water from the headrace to the lower powerhouse (E&Ph photos 28, 35). An east-west wall extending from the eastern side to beyond the southwest unit divided the wheelpit into two chambers. The two northern wheels received ample water from the side and the two front gates. The southwest turbine also had enough water, but the southeast unit located in the corner behind the wall on many occasions starved for water (E&Ph drawings 8 and 9, photo 36; also photo 37 for original blueprint plans of the upper power house).

Those four turbines drove two shafts spanning the old raceway. The lower shaft powered Mill No. 1, while the upper shaft turned a complicated rope drive system driving the entire upper portion of the complex, including all of No. 2 mill, the rope manufacturing department, the machine shop, the wool picker room, and the dye house (E&Ph photos 38, 39, 40, 41). The capacity of the rope drive system was rated at 700 horsepower, while the machinery it drove required 1,262 horsepower. The ropes could be blown down in high winds, and the tell-tales, designed to detect wear on the ropes, were constantly tripped by paper, sticks, and waste on the rope, stopping the ropes and all the machinery they drove. Electricity provided the solution to the problem. In 1906 the directors authorized the purchase of an electric generator, and by 1907 a 500 kW vertical generator supplied current to four separate motors for all of the operations at the upper end of the complex except Mill No. 2. This No. 1 generator still operates today [43] (E&Ph photos 42, 43; see also Appendix II, sections on "Electrical Plant" and "Electrical Department").

Electrification also provided a solution to a legal controversy over water rights between the Eagle and Phenix and Muscogee Mills. In 1898, Muscogee enlarged the openings in its head wall and increased the size of its turbines, thereby reducing the amount of water available farther downstream, especially in periods of low water. The Eagle and Phenix sued on the grounds that Muscogee took more than its proportional share (1/19) of water; Muscogee held only one of the original 19 water lots. Muscogee argued that they had a right to more than 1/19 of the water, since the Eagle and Phenix had not developed all of its 18 water lots; that Eagle and Phenix sustained operations in low water better than Muscogee could; and that the real problem was the Eagle and Phenix inefficient powerhouses. The courts failed to support the Eagle and Phenix, and finally the two companies agreed that Muscogee would stop taking water from the river provided the Eagle and Phenix supplied Muscogee with 500 horsepower per day. [44]

Electricity (from the No. 1 generator) supplied that power. After 1910, the Eagle and Phenix electrified further, to replace the inefficient rope drives supplying Mills No. 1 and 2, and also because of the unreliability of the water supply. Periods of low and high water stopped the operation of the mills. By 1912 several new dams had been built on the river above them, and both the cities of Atlanta and Columbus had started taking their water supply from the river. Gunby Jordan complained "we at the first falls of the Chattahoochee have been subjected to more stoppages in the last few years than ever dreamed possible." Electrification again provided the solution. The company's alternatives were to buy electricity from Columbus Power Company, build its own steam plant, or develop its own hydroelectric facility. At that time the power company could not furnish the needed current without building a new plant. So the Eagle and Phenix decided to convert its mechanical power to electricity.

Jordan suggested one other alternative: sell the site to the power company and move the mills out of the city. By 1913, with the existing ability to transmit electricity anywhere, Jordan saw few advantages to being in the city. The mills maintained their own electric lights, police, and fire protection. There were, Jordan told his fellow directors, "evident disadvantages, street parades, accessibility of the office to interruptions from promoters, begging committees, people who desired to consult on many possible and impossible affairs and the demoralization natural to incidents occurring in a city as opposed to those mills located outside of the city and the help living contiguously thereto." City taxes also bothered Jordan; with 15 years of taxes he could build a new mill. Jordan probably had no intention of moving the operation, but just used the device to emphasize the company's problem. His disaffection was better revealed by the placement of both Bibb Manufacturing, with which he was involved, and his own hosiery mill outside the city. The inertia of the Eagle and Phenix was too great to move its 70,000 spindles, 2,000 looms, and 1,500 operatives; it remained where Young had established it. [45]

Instead of moving, the Eagle and Phenix quite typically developed its own electric capacity. In 1914, modifications of the upper power house strengthened it to allow three more vertical generators (600 kVA, 3 phase) to be placed over the remaining turbines (E&Ph photo 42). This plant provided power for Muscogee, the Eagle and Phenix dye house, and the upper ends of Mills No. 1 and 2. In 1920-1921, similar conversions in the lower power house (E&Ph photos 44, 30) resulted in the installation of five generators: two 500-kW (NW & SE) and three 400-kW (Center, NE, and SW). [46] (See Drawings 8, 9, 10, and 11; E&Ph photos 45, 46, 47, 48, 49.)

After the initial shift to electricity, Jordan left the company. Perhaps after modernization, ever-active Jordan found the routine pace of the mill too placid. In 1915 W. C. Bradley, a business associate of

Jordan and eventually his replacement as the city's most important businessman, succeeded Jordan as company president. [47]

The operation of its hydroelectric power houses since 1915 provide a microcosm of the company as a whole: no longer a prototype of modernity, only slight changes were made in what continued to be a profitable operation. Engineering reports for the last 50 years have shown that the hydroelectric power developed at the Eagle and Phenix was extremely inefficient, with calculated efficiencies reported as low as 44%. The efficiency of a modern plant is in the 80% range. [48]

The original defects in the operation were due primarily to the inefficiency of the turbines for electric power production; they were built for mechanical power and functioned best with such a system. While the efficiency of mechanical power transmission cannot approach that of electric power transmission, the turbines were not suited to be directly connected to generators. Another source of inefficiency was the age of the turbines; they required more water to develop the same power.

As far back as 1938, engineers from Charleston wrote that "the equipment [generating system] is very near the end of its useful life." The following data was analyzed in 1938.

A	B	C	D	E	F=D&E
Head in Feet	CFS (Q) Cubic Feet per Second	Efficiency of Capacity on Switch- board in kW	Present Plant Efficiency (Qh).0694x kW 100 = %	Estimated Generator Efficiency %	Resulted Turbine Efficiency
27.50	1460	1710	50.37	90.1	55.9
27.50	1580	1800	48.96	90.3	54.22
27.32	1300	1860	61.88	90.3	68.52
24.57	3580	3520	47.28	93	50.82
24.57	4130	3740	43.55	93.6	46.53
24.52	2903	3571	59.27	93.0	63.73
24.50	4029	3810	45.62	93.7	48.69

As noted, a new turbine in good order should run at around 80% efficiency; here the combined efficiency of nine turbines is around 50%. [49]

Eagle and Phenix tied its power status into the Georgia Power Company transmission system in 1931 for several reasons. Before the interconnection, when the plant was fully loaded, fluctuations in the river often caused the frequency of the current generated to fall off. This caused motors to run slower, and production was consequently slowed.

In dry periods, electric production had to be curtailed altogether.

Interconnection with Georgia Power guaranteed 60-cycle frequency on the Eagle and Phenix lines at all times. In low water, power was purchased. In times of adequate flow and sufficient working head, Eagle and Phenix sold "dump" power to the Power Company. Eagle and Phenix in 1938 paid 1¢/kWh for power purchased from the Georgia Power Company; they received 1/2¢ / kWh for any "dump" power sold.

In 1937 the mills consumed 15,022,080 kilowatt-hours (kWh) of electricity. Of this, 1,612,000 (or 10.7%) were purchased from the Georgia Power Company. The inefficient power station produced 90% of the electricity needed. In the same year, 2,134,000 kWh of dump power was sold to the Power Company, which nearly off-set the cost of purchased power. Today the relationship is the same. The mills can meet between 80% and 90% of their power needs when demanded; they continue to dump power into the Power Company's systems when the mills have a surplus.

A recent study showed that the old system is still in good condition "considering its age." A modern installation would consist of three 72-inch water wheels, each driving a 3,000-kW capacity generator--two for average power needs, the third for auxiliary capacity. This sort of installation requires a greater minimum flow to turn the wheels. At night the Georgia Power Company dams impound water to store for daytime capacity. Only 1,100 cubic feet per second is released at night. A new plant therefore could not meet power requirements at night as this plant can. The study concluded that it is more economical to run the present plant as it is now operated than to replace it with modern equipment. [50]

#### RECENT BUSINESS HISTORY

The self-generating electric facility constituted the most unique feature of the Eagle and Phenix operation, for after 1915 the company's experiences seemed to parallel those of other southern textile firms. Prosperity came with World War I. During the Depression, it had minor labor problems and suffered from the weak economy but continued to run on a reduced schedule. The increased demand during World War II resulted in an addition to Mill No. 3. [51] The new construction involved demolishing the mill's northern stairtower (E&Ph photo 50; compare E&Ph photos 51 and 52 with 53).

By the end of the war, the mill's product line was greatly reduced. Sometime after 1905 the company stopped manufacturing wool. In 1946 it still produced rope and ball thread and a whole range of fabrics: Canton flannels, ticking and stripes, shorting flannels, wash suiting, and whip cord. The war caused some modifications as the mill produced material for work clothing, linings for jackets and windbreakers, and uniforms for the armed forces.

In 1947, after the death of W. C. Bradley, Reeves Brothers, Inc., purchased the mill. Initially, Reeves Brothers changed the operation very little. During the mill's centennial celebration in 1951, the products it reported manufacturing remained basically the same: "woven denims, shirting, plaid flannels, plain and herringbone twills, canton flannels, interlining flannels, suedes, slack suiting, drapery and upholstery fabrics, ticking, ball thread and rope." At that time the Eagle and Phenix had "2,200 employees, 60,996 spindles and 1,567 looms, produces 25 million pounds of finished goods each year with a value in excess of \$24 million." The plant consumed 45,000 bales of cotton each year and paid over \$5 million in wages and salaries. [52]

During the 1950's Reeves Brothers accelerated the conversion of the plant into two separate operations: manufacturing in the southern and finishing in the upper portion. The manufacturing division primarily used old Mill No. 3 and its 1943 addition. In 1963 another 33,000 square feet of courtyard were enclosed to expand the facility. During the 1960's, air conditioning and large-scale humidification systems necessitated bricking up the windows in the functioning areas. Along the river or the raceway, all the structures from Mill No. 3 north to Mill No. 1 have been connected to form one continuous four-story brick building. The various processes within old No. 3 were expanded into this space. The manufacturing division used one floor of Mill No. 1 for spinning until 1977. Now that entire building, along with Mill No. 2, has been converted into warehouses. The manufacturing division continued to produce wearing apparel: denims, twills, suitings, flannels, shirting, gabardine, and suedes, products very similar to those always manufactured by the Eagle and Phenix. In the late 1950's, the addition of cotton combers allowed the company to make a higher quality product. The woven cloth with plaid and striped patterns resembles those fabricated by Mill No. 3 in the late 1870's. The company has little difficulty selling these products. The modification of the mills has reduced the amount of manufacturing equipment. By 1963 the company operated fewer but higher speed cards, 45,924 spindles, and 923 looms. [53] (See Appendix III.)

The finishing division on the upper end of the property dyed and finished material for the manufacturing division, for other units in the Reeves chain, and for any other customer. Portions of Mill No. 2 have been incorporated in its operation, but basically the finishing operation centered in the old dye house, which was enlarged to two stories and incorporated smaller adjacent buildings in a fashion similar to Mill No. 3's expansion at the southern end (E&Ph photos 54).

In 1954, newly installed yarn-dyeing equipment included two 6-kier Gaston County machines, two 3-kier Smith Drum, and one 1-kier Smith Drum dyeing machine. This system, according to Textile World, processed as much as 180,000 pounds of cotton yarn per day, "most of which are dyed with sulphur dyes; however vat, naphthol, direct, and developed dyes are also used."

In addition to beam and raw stock dyeing, this division is also involved in napping, cutting, brushing, sanforizing, and water-proofing finished goods. In 1963 its eight departments incorporated 192,000 square feet of space with an annual production capacity of 35 million yards. A key determinant in placing a large-scale finishing plant within the Eagle and Phenix must have been the availability of water from the Chattahoochee. Reeves Brothers built another settling basin to supplement the one blasted out of granite in the 1880's. [54]

During the last 20 years, Reeves Brothers only slightly modified the physical appearance of the mills. In addition to linking structures to form the two concentrations of buildings for manufacturing and finishing, they built more offices on the western side of the inside court paralleling the older office along Front Street, installed a conveyor system joining the production units with the finished product storage area above these old offices, and paved over the flower beds in the interior court. By making small modifications, Reeves Brothers has preserved the mills by making them a profitable enterprise. The complex still retains its 19th-century flavor (compare E&Ph photos 54 and 55). Mills No. 1 and 2 (the latter has only a few bricked windows; see E&Ph photo 56) and the Front Avenue offices remain almost as they were when originally constructed. The visual impression of a turn-of-the-century mill complex is reinforced by the fact that Muscogee's Mills No. 1 and 2, built in 1868 and 1880, are contiguous with the Eagle and Phenix.

These mills stand as evidence of the important industrial past of Columbus. During the 19th century, when these mills were built, the city liked to call itself the "Lowell of the South," and in certain superficial respects Columbus resembled Lowell. In both, the original impetus came from the availability of a tremendous quantity of water power, although Columbus never constructed a canal. Columbus, particularly the Eagle and Phenix, pioneered large-scale industrialization in the South, as Lowell did earlier in New England. Columbus, admittedly not as significant as Lowell, never received proportional recognition. Historians writing about the origins of New South industrialization concentrated on the Carolinas and the developments after 1880, thus neglecting the Eagle and Phenix and Columbus.

Also, Columbus never built the dense concentration of mills that characterized Lowell, since much of the Columbus development came after electrification and could be more dispersed. Lowell's major mills, however, no longer operate, while the Eagle and Phenix and Muscogee still function. The fact that the Eagle and Phenix's turbines, installed in 1899, and its electrical generators (1907, 1914, and 1920) still operate today best illustrates the continuity that characterizes these mills. Not only were the Howard and Eagle Mills important antebellum southern mills and the Eagle and Phenix a prototype for successful "New South" mills, but the Eagle and Phenix, unlike so many of its New England counterparts, still functions after 130 years, greatly enhancing the historical significance of these mills.

Footnotes

1. Testimony of William H. Young in U.S. Congress, Senate, Committee of Education and Labor, Report of the Committee of the Senate Upon the Relations Between Labor and Capital, and Testimony Taken by the Committee (Washington: Government Printing Office, 1885), IV, p. 508; "William H. Young," Biographical Souvenir of the States of Georgia and Florida (Chicago, 1889), pp. 817-820; W. C. Woodall, "Colorful and Interesting Career of William H. Young, An Industrial Leader Over A Long Period," The Columbus Magazine, III, 4 (31 July 1942), pp. 11-16; letter from Ridgeway and Gunby to Col. Farish Carter, 25 January 1849, Farish Carter Papers, Southern Historical Collection, University of North Carolina at Chapel Hill.
2. George White, Historical Collections of Georgia... (New York, 1854), p. 570; Richard Worden Griffin and Harold S. Wilson, "The Antebellum Textile Industry of Georgia," (Unpublished Manuscript), pp. 156-167; biography of J. Rhodes Browne in the appendix of Nancy Telfair [Louise Gunby Jones Du Bose], A History of Columbus, Georgia, 1828-1928 (Columbus, 1929).
3. Columbus Enquirer, 7 March 1854; Frederick Law Olmsted, The Cotton Kingdom (New York, 1962), p. 213; White, Historical Collections, p. 570.
4. Columbus Enquirer, 21 June 1853, 2 January 1855; testimony of Young, Report of the Committee of the Senate Upon the Relations Between Labor and Capital, IV, p. 508.
5. "Eagle and Phenix River Development" (typescript, 3 February 1964, probably written by R. D. Betts), Eagle and Phenix Company Records (hereafter cited as EPCR); E. H. Hinton, "A Historical Sketch of the Evolution of Trade and Transportation at Columbus, Georgia" (typescript, 1912), pp. 34-35.
6. George White, Statistics of the State of Georgia (Savannah, 1849), p. 446; Griffin & Wilson, "Antebellum Textile Industry of Georgia," pp. 154-155; over eighty letters dated from 5 February 1860 to 28 May 1861, John H. Howard Collection, Georgia Department of Archives and History, Atlanta; Hunts Merchant Magazine (August 1850), p. 247 (taken from the Albany Patriot).
7. Griffin and Wilson, "Ante-bellum Textile Industry of Georgia," pp. 156-157; Diffie William Standard, Columbus, Georgia in the Confederacy, the Social and Industrial Life of the Chattahoochee River Port (New York, 1954), pp. 33-35; Columbus Daily Enquirer, 2 December 1862.

8. Griffin and Wilson, "Ante-bellum Textile Industry of Georgia," p. 157; Standard, Columbus...in the Confederacy, pp. 33-35 and 60-61; Columbus Daily Sun, 18 July 1866; biography of R. M. Gunby, Telfair, Columbus (Gunby was the author's great-grandfather).
9. Columbus Daily Sun, 1 November 1865.
10. Columbus Daily Sun, 29 October, 9 November, 17 December, 1865, 4 May 1866; Columbus Daily Enquirer, 1 January 1866; Eagle and Phenix Charter (typescript), EPCR.
11. Columbus Daily Sun, 25 April, 8 May 1866, 7 May 1867; Annual Report to the Stockholders for the Year 1877, EPCR.
12. Columbus Daily Sun, 10 March, 9 May, 24 June 1866, 9 May 1867; Columbus Daily Enquirer, 5 May 1867.
13. Broadus Mitchell, William Gregg, Factory Master of the Old South (Chapel Hill, 1928), pp. 235-237; Columbus Daily Sun, 22 January, 12 and 13 February, 8 and 22 March, 7 May 1868; Columbus Daily Enquirer, 8 August 1868; Annual Report...1868, EPCR; 1870 Insurance Map, Alva C. Smith Collection, Columbus College Archives.
14. Annual Report...1868 and "Eagle and Phenix River Development," EPCR; Columbus Daily Enquirer, 25 April, 18 August 1869; Columbus Daily Sun, 7 September 1872.
15. Some of the early dividends might have been paid in scrip or additional stock. Columbus Daily Enquirer, 27 April 1869, 18 July 1871; Columbus Daily Sun, 9 May 1867, 22 March 1868, 7 February 1869; Testimony of Young, Report of the Committee of the Senate Upon the Relations Between Labor and Capital, IV, p. 510; "List of Stockholders" printed with Annual Report...1870, EPCR.
16. Columbus Daily Enquirer, 25 April, 28 September 1869; Annual Report...1870, 1871, EPCR; 1870 Insurance Map; "List of Real Estate Owned by the Eagle and Phenix Manufacturing Company, 13 June 1896," EPCR (the receivers prepared this inventory, and they asserted that Mill No. 2 still had its original looms).
17. Much of the preceding and next several paragraphs parallel those in John S. Lupold, "The Industrial Reconstruction of Columbus, Georgia, 1865-1881" (paper read at Georgia Historical Society Meeting, October 1975), pp. 12-13, 17-18; Columbus Daily Enquirer, 30 October 1869, 18 January, 17 February 1870; Columbus Daily Sun, 5 March, 21 July 1870; Columbus Sunday Enquirer, 9 May 1875, 4 May 1876; Columbus Daily Enquirer-Sun, 21 May 1878; "Stockholders List," 1870, EPCR; Manuscript Census for Tenth Census, 1880, Manufactures, Table V, Muscogee County; Testimony of Young, John Hill (company

- engineer), A. S. Matheson (mill manager), and Eliza Jackson Borden, Addie Priscilla Jones, Della Barnes (operatives), Report of the Committee of the Senate Upon the Relations Between Labor and Capital, IV, pp. 508-523, 534-540, 582-595, 595-603.
18. Columbus Daily Enquirer, 18 August 1868, 1 October 1870, 3 February, 22 April, 23 August 1871; Columbus Daily Sun, 14 August 1870; Annual Report, Eagle and Phenix, 1870, 8-10; price lists, Eagle and Phenix, 18 July 1878 and 28 November 1879; testimony of William H. Young, Report of the Committee of the Senate Upon the Relations Between Labor and Capital, IV, p. 510.
  19. Under normal circumstances the company did not pay its workers in scrip. The Eagle and Phenix paid \$7,000 in federal taxes on its currency, meaning it actually issued \$70,000 in paper money. Columbus Daily Enquirer, 8 May, 30 September, 21 October, 22 October, 23 October 1873; Columbus Daily Enquirer-Sun, 26 February 1878; testimony of William H. Young, Report of the Committee of the Senate Upon the Relations Between Labor and Capital, IV, p. 511; Annual Report, Eagle and Phenix, 1874; G. Gunby Jordan to P. W. Alexander, 9 December 1876, Jordan File II, Georgia State Archives; Congressional Record, 45th Congress, 1st Session, House (1 November 1877), p. 208, 2nd Session, House (7 December 1877), pp. 73, 76-77, Senate (11, 20 February 1878), pp. 922, 1198-1201.
  20. Columbus Daily Enquirer-Sun, 4, 13, 23, 30 October, 6 November 1878, 12 August 1880; Raphael J. Moses, "Autobiography" (typescript), pp. 88-94, Columbus College Archives. The tax relief was an issue in the 1878 race for U.S. Congress. The local incumbent had actively worked for the bill, while his opponent fought it and won the election. The challenger benefited from rural supporters who seemed to distrust Columbus, industries in general, the Eagle and Phenix, and particularly its wealthy industrialists. The Eagle and Phenix was such a dominant force that even within the city the political "outs" identified their primary enemy as the Eagle and Phenix group. The leader of the dissidents was Raphael J. Moses, a brilliant and independent-minded lawyer and politician. In the late 1860's Moses had been a director of the company, but he and Young argued over a legal fee which owed him and by the 1870's Moses constantly battled against Young and any of his allies. Moses, however, acknowledged that Columbus would have been a "dead town" without Young.
  21. Annual Report...1873, EPCR; Columbus Daily Enquirer-Sun, 21 July, 24 August, 14, 16 September, 29 December 1876; Columbus Sunday Enquirer, 19 March 1876.
  22. Annual Report...1877, EPCR; Columbus Daily Enquirer-Sun, 15 February, 18 July, 13 December 1878; testimony of John Hill, Report of the Committee of the Senate Upon the Relations Between Labor and

- Capital, IV, pp. 582-595; list of real estate, 13 June 1896, EPCR.
23. Company histories assert but offer no substantial proof that the Eagle and Phenix was the "first" textile mill to be lit by electricity. The first mention of the arc lighting in company records occurred in 1885, simply stating that such lights had been installed since 1880-1881 and that they were so successful that they were being extended to other areas of the mill. No claims for being a pioneer were made at that time. Annual Report...1885; Harold C. Passer, The Electrical Manufacturers, 1875-1900 (Cambridge, Mass., 1953), pp. 19-21; John W. Oliver, History of American Technology (New York, 1956), 347-348; A.T. Roberts, "Columbus: Typical of the South," Manufacturer's Record, 1925, p. 85.
  24. The following account of Hill's career from: Columbus Daily Enquirer-Sun, 9 October 1888 (also reported in Textile Record); "Neracher and Hill Automatic Sprinkler Company Charter," Muscogee Superior Court Records, October 1891; "Eagle and Phenix River Development" and "Eagle and Phenix Mills Centennial," EPCR; Columbus Enquirer-Sun, 21 January 1898 (his obituary). Hill's son, John Hill, Jr., was a prominent textile mill designer; he was responsible for 35 large mills, including the modification of the Bibb & Swift mills in Columbus.
  25. Columbus Daily Enquirer-Sun, 28 August 1880, 1 September 1881; testimony of Young, Report of the Committee of the Senate Upon the Relations Between Labor and Capital, IV, pp. 508-523.
  26. Manuscript Census of Georgia for the appropriate counties in Tenth Census, 1880, Manufactures, Table V.
  27. Columbus Sunday Enquirer, 6 February, 5 March, 11 June 1876; Columbus Daily Times, 8 January 1879; Columbus Daily Enquirer-Sun, 12 September 1876, 30 January 1878, 9 July 1881; Atlanta Daily Constitution, 9 March 1880; Charleston News & Courier, 19 February 1879, 9 February, 14 August, 11 November 1880, 25 April 1881, 4 October 1882, 13 February 1883, 27 December 1883, 12, 17, 21, 22 March, 5, 12, 28 April, 4, 17 July 1884, 1 June 1886; Augusta Daily Chronicle and Constitutionalist, 8 February, 23 November 1879, 10 March, 8 May, 7 November 1880, 3 November 1881; Textile Record, November 1886, June 1889; "Important Southern Cotton Mills, Factories of the Eagle and Phenix Manufacturing Company, Columbus, Georgia," Textile Record (September 1892), p. 335; see also HAER Augusta Report No. 4, John P. King Manufacturing Company.
  28. The editors and industrialists of the 1880's praised the Eagle and Phenix; historians who have written about the origins of New South industry have focused almost entirely on the Carolinas, ignoring Georgia and especially Columbus. The most important of these

writers, Broadus Mitchell, in his classic The Rise of Cotton Mills in the South (1921), tried to prove that industrial growth did not begin in the South until 1880. His primary source was interviews with the Carolina industrialists who tended to remember only what they had accomplished. His only reference to Columbus occurred in a footnote where he cited an Atlanta Constitution article discussing the industrial progress of Columbus in 1880. Obviously, Columbus conflicted with this thesis: Broadus Mitchell, The Rise of Cotton Mills in the South (Baltimore, 1921), pp. 78, 9-76. Other authors who stress the 1880's and focus primarily on the Carolinas include Ben F. Lemert, The Cotton Textile Industry of the Southern Appalachian Piedmont (Chapel Hill, 1933); Emory A. Hawk, Economic History of the South (New York, 1934); Robert B. Vance, Human Geography of the South, A Study in Regional Resources and Human Adequacy (Chapel Hill, 1935). In the following contemporary account from the Textile Record (September 1892), p. 335, the author gave Eagle and Phenix much more attention.

29. Annual Reports...1883, 1885, 1886; William H. Young, "Circular to the Stockholders, 1891" (handwritten copy), EPCR; testimony of Young, Report of the Committee of the Senate Upon the Relations Between Labor and Capital, IV, pp. 508-523.
30. Annual Report...1888, 1892, 1893, 1895; Receivers Report, 13 June 1896, EPCR; Sanborn Insurance Maps of Columbus, Georgia.
31. Annual Report...1886; Textile Record VIII (1887), p. 31, and XI (1890), p. 158; "List of Real Estate...1896," p. 36, EPCR.
32. Circular advertising "\$250,000 Eagle & Phenix Manufacturing Company of Columbus, Georgia First Mortgage Coupon 6% Bonds"; Young's "Circular to the Stockholders, 1891"; and Annual Report of the President of the Eagle and Phenix, 3 February 1892, EPCR; Columbus Daily Enquirer-Sun, 20 December 1891.
33. Melton Alonza McLaurin, Paternalism and Protest, Southern Mill Workers and Organized Labor, 1875-1905 (Westpoint, Connecticut, 1971), pp. 129-133; Columbus Daily Enquirer-Sun, 1, 28, and 29 March 1896.
34. Columbus Daily Enquirer-Sun, 28 March-17 May 1896; McLaurin, Paternalism and Protest, pp. 133-164.
35. McLaurin cited this as the only example of corruption in a southern company during this period plagued by corruption on the national level. The receivers reported that Bigby owed the company \$50,000. Columbus Daily Enquirer-Sun, 14-21 June, 5 August, 14 October 1896.
36. Ibid., 8 June 1898, 6 July 1899.

37. Receivers Report, 13 June 1896, December 1897; Stockholders Meeting, 4 July 1906, EPCR; Telfair, Columbus.
38. Daniel J. Boorstin, The Americans, The Democratic Experience (New York, 1974), pp. 89-145.
39. Report of Mr. Massey to Board of Directors, 22 January 1913, EPCR.
40. "List of Northrop Model 'E' looms sold by 1 July 1904," in Labor Saving Looms (Hopewell, Massachusetts, 1904) [read to the author by Donald Marshall, Hopewell-Draper Corporation, Spartanburg, South Carolina]. This list showed 328 sold to Eagle and Phenix by that date; not very many when compared with the 1,088 at Fulton Bag (Atlanta), the 1,292 in Lindale, Alabama, the 1,718 in a Huntsville, Alabama, plant. Receivers Reports, 13 June 1896, 14 June 1897, 21 December 1897; Stockholders Meeting Minutes, 4 July 1896; Report to the Stockholders, 5 February 1913; Executive Committee Minutes, 12 November 1912, 7 January 1913; Board of Directors Minutes, 5 February, 13 June, 5 November 1913; Report of the Superintendent, 1907, 1913, compared "List of Real Estate...1895" with "Schedule of Facilities, Mechanical and Otherwise" in Superintendent Report for 1905, EPCR; I. Feller, "The Draper Loom in New England Textiles, 1894-1914: A Study of Diffusion of an Innovation," Journal of Economic History, September 1966; Lars G. Sandberg, Lancashire in Decline, A Study in Entrepreneurship, Technology, and International Trade (Columbus, Ohio, 1974), pp. 67-70.
41. "Eagle and Phenix Centennial," Board of Directors' Minutes, 3 January 1906, 5 February 1913, Superintendent's Report, 1905, 1907, 1908, EPCR.
42. "Eagle and Phenix River Development," EPCR.
43. Current company records and the oral tradition among the power house crew do not separate this generator from the other three in the upper power house, but it must be the original generator installed in 1907. Initially it was wired for two-phase, and later it was converted to three-phase in 1965. Louise Gunby DuBose [Nancy Telfair], who relied heavily on her cousin Gunby Jordan, gave the 1907 date. Columbus, 197-201; Receivers Report, December 1897; Board of Directors Meeting, 3 October 1906; Executive Minutes, 13 November 1906, 31 July 1907; Report to the Stockholders, 1908, EPCR.
44. Receivers Report, December 1897; Stockholders Meeting, 4 July 1906; Muscogee Superior Court Records of Write, 1908-1909, pp. 416-424.
45. Board of Directors Minutes, 5 February 1913, EPCR; "Utilizing the Chattahoochee River Water Power," Manufacturer's Record, 1910, p. 62.

46. Executive Committee, 13 March 1906, 9 February 1909, 4 June, 10 December 1912; Stockholders' Meeting, 4 July 1906; Board of Directors Minutes, 21 April 1909, 3 July 1912, 2 April 1913; EPCR. Each generator in the upper house is directly connected to a D.C. exciter. Holyoke Improved governors provide mechanical speed regulation at the turbine gates. Oil pumps (driven by the turbine) and tanks for these hydraulic governors are located in the starter level of the station. Regulation is automatic or manual. The switchboard stands at the east side of the station; two transformers are on the south end. A fire pump in a room outside the west wall is fed water through the west gate. The current (550 volts, three-phase) runs to the mills across a steel bridge over the old raceway. A small step-down substation is located on the mill end. In the lower powerhouse, two D.C. exciting generators driven by electric motors provide the field excitation for the five generators. The switchboard and exciters are located on an elevated platform in the northwest section. The water wheels are regulated as are those in the upper house, but oil pumps and tank are on the turbine level. The transformers stand in a section partitioned from the generator room on the west side.
47. After leaving the Eagle and Phenix, Jordan reorganized the Perkins Hosiery Mills. In a manner similar to both Young and Jordan, Bradley maintained a wide range of economic interests. Coming to Columbus in the 1880's, his initial involvement as a cotton merchant rapidly expanded into hauling, the Columbus Iron Works, two other local textile mills, the statewide Bibb Manufacturing Company, and other investments such as Coca-Cola. Bradley's biography in Etta Blanchard Worsley, Columbus on the Chattahoochee (Columbus, 1951).
48. Efficiency here is the ratio of power capacity read at the switchboards to the potential power of the water flowing over the dam. Power of water is given by the flow in cubic feet per second [Q] times the effective head in feet [h] times a conversion factor. Expressed in kilowatts,  $kW = Qh.0694$ .
49. Discussion of the mill's early problems with hydroelectric transmission from informal interview with Don Hildreth, present engineer at the Eagle and Phenix, 5-6 July 1977. The chart was prepared by J. B. Karfunkle from data collected by R. B. Betts, former plant engineer, and by Don Hildreth. See letter from Mees and Mees, Inc., to Eagle and Phenix, 1938, in Hildreth's files, EPCR.
50. Letter to Reeves Brothers from Robert and Company, Associates, 2 September 1960, Hildreth files and other records and correspondence of R. D. Betts, Hildreth's files, EPCR.
51. Interview with Hoyt Terry, Office Manager of the Eagle and Phenix, 7 July 1974; "Eagle and Phenix Mill Centennial."

52. "Report of the Examiners," William F. Coflin and Company, 31 August 1946, EPCR; Columbus Ledger-Enquirer, 18 November 1951, A-8; "Eagle and Phenix Mill Centennial."
53. "Eagle and Phenix, A Modern Historic Mill," 3 June 1970, "Eagle and Phenix Cotton Mill Machinery," 20 December 1963 (typescripts), EPCR; interview with Don Hildreth, Plant Engineer for the Eagle and Phenix, 5-6 July 1977.
54. Michael Landon, "Reeves Brothers Completes Its New Yarn Dyehouse," Textile World (November 1954), pp. 148-150; draft of an article for the Columbus Ledger-Enquirer by Joe Fuller, 17 November 1963; "Eagle and Phenix, A Modern Historic Mill," EPCR.

## Bibliography

### Primary Sources

Eagle and Phenix Company Records. The primary company records have been collected in the offices of the plant engineer, Don Hildreth, and the office manager, Hoyt Terry.

Office Manager Records. Printed reports of the President to the stockholders, 1868-1892, explain major changes and any problems encountered; printed reports of receivers, 1896, 1897, and superintendent reports, 1905, 1907, and 1913, focus specifically on the equipment and its replacement; one hand-written minute book (1906-1913) gave valuable information within the proceedings of the minutes of the directors, the executive committee, and the stockholders and in the reports of various company officers.

Plant Engineer Records. Correspondence and reports collected primarily by R. B. Betts, former company engineer, pertaining to the company's hydroelectric facilities.

The Report of the Committee of the Senate Upon the Relations Between Labor and Capital, Washington, 1885, contained testimony of William H. Young, John Hill, and several operatives describing the operation and conditions at the Eagle and Phenix Mills.

### Secondary Sources

"Eagle and Phenix Mills Centennial," 12 pages (a typescript manuscript in the Eagle and Phenix files, probably written by W. C. Woodall), offered a brief sketch of the company's history.

The following articles gave detailed descriptions of the Eagle and Phenix: "Important Southern Cotton Mills, Factories of the Eagle and Phenix Manufacturing Company, Columbus, Georgia," Textile Record (September 1892); and Michael London, "Reeves Brothers Completes Its New Yarn Dyehouse," Textile World (November 1954), pp. 148-156.

APPENDIX I: Inventory of Eagle & Phenix Equipment, 1896

(From The Receivers Report on the Condition of the  
Eagle & Phenix, June 13, 1896)

No. 1 Mill

Card Room

- 40 40" Pettee Machine Revolving Flat Cards.
- 13 Pettee Machine Doublers.
- 2 Intermediates, Saco W. P., 84 Spindles each.
- 1 Intermediate, Higgins, 84 Spindles.
- 1 Slubber, Higgins, 44 Spindles.
- 1 Slubber, Higgins, 72 Spindles.
- 3 Slubbers, Higgins, 96 Spindles each.
- 3 Speeders (Roving Frames), 120 Spindles each.
- 2 Speeders (Roving Frames), 120 Spindles each.
- 7 Speeders (Roving Frames), 120 Spindles each.
- 2 Roller Card Grinders.

Picker Room

- 2 Self-Feeding Kitsons Openers.
- 2 Breaker Lappers, (Lord Bros.)
- 2 Intermediate Lappers (Lord Bros.)
- 3 Kitsons Finisher Lappers.
- Trunk, Condensers and Circles for Kitsons Lappers.

Spinning Room

- 60 Frames, 176 Spindles each, (Saco W. P. Co.)
- 1 Band Machine.

1 Reel for Testing Yarn.

1 Pair Grain Weighing Scales.

Dressing Room

10 Long Chain Beamers

2 Quillers, E. & P. make, 76 Spindles each.

2 White Spoolers, 100 Spindles each, Saco W. P.

5 White Spoolers, 50 Spindles each, Saco W. P.

2 Cylinder Slashers, Lowell.

1 Cylinder Slasher, Dugdale & Son.

4 Lease Warpers, Lowell.

3 Lewiston Warpers.

2 Reels, 60 Spindles each.

Weave Room

60 1 x 2 Box 36" New Crompton Looms.

8 1 x 4 Box 36" Crompton Looms.

65 1 x 3 Box 40" Thos. Wood Looms.

20 1 x 2 Box 40" Thos. Wood Looms.

30 1 x 2 Box 40" Bridesburg Looms.

1 Cloth Rolling Machine, E. & P. make.

Wool Card Room

7 Sets 48" Cleveland Woolen Cards, with Apperly & Bramwell Feeds.

1 Set Jas. Smith Woolen Machine Co., 48" Woolen Cards, with Apperly & Bramwell Feeds.

1 Bridesburg 48" Finisher Card.

1 36" Garnet Machine, (Jas. Smith).

- 1 48" Cleveland Spooler.
- 1 Solid Card Grinder and Frame.
- 1 Hardy Grinder and Frame.
- 4 Hardy Traverse Grinders and Stands.
- 5 Parr, Curtis & Madelay Mules, 504 Spindles each.

Wool Finishing Room

- 1 Davis & Furber 480 Spindle Mule.
- 1 Davis & Furber 336 Spindle Mule.
- 1 Davis & Furber 336 Spindle Mule.
- 1 Curtis & Marble Shear, (present date).
- 2 Roll Back P. & W. Shear.
- 1 Rotary P. & W. Shear.
- 1 Curtis & Marble Winder.
- 1 Brushing Machine.
- 4 Cleveland Upright Gigs.
- 1 Clarenbuch Napper.
- 1 Cloth Winder. (No name.)

Wool Picker Room

- 1 Howgate Duster.
- 1 C. C. Sargent 36" Wool Burr Picker.
- 1 36" Jas. Smith Mixing Picker, with Improved Self-Feed.
- 1 Ordinary 36" Cleveland Wool Picker.

Wool Weave Room

- 20 1 x 1 Box 40" Gilbert Looms, (new).
- 18 1 x 1 Box 40" Gilbert Looms, (old).

- 31 1 x 2 Box 40" Gilbert Looms, (old).
- 10 1 x 3 Box 40" Gilbert Looms, (old).
- 10 1 x 3 Box 42" Gilbert Looms, Fancy (new).
- 2 3 x 3 Box 42" Gilbert Looms, Fancy (new), P. & P.
- 16 1 x 4 Box Clipper Looms, with Crompton Box Motion.
- 18 1 x 3 Box 40" Gilbert Looms, (old).
- 35 1 x 3 Box Bridesburg Looms, (old).

No. 1 Mill

Total Spindles.....10,560 ring spindles  
Woolen Department..... 3,627 mule spindles

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14,232

Total Looms

No. 1 Mill.....183 looms  
Woolen Department.....160 looms

No. 2 Mill

- 49 Higgins 40" Cards.
- 6 Higgins Drawing Frames, 6 Deliveries each.
- 5 Pettee Doublers.
- 6 Pettee Drawing Frames, 6 Deliveries each.
- 1 Higgins Slubber, 96 Spindles.
- 1 Higgins Slubber, 84 Spindles.
- 1 Higgins Slubber, 44 Spindles.
- 6 Higgins Speeders (Roving Frames), 120 Spindles each.
- 5 Saco W. P. Speeders (Roving Frames), 120 Spindles each.

2 Saco W. P. Slubbers, 68 Spindles each.  
8 Hardy Traverse Grinders.  
1 Boring Reel.  
100 1 x 4 Box 36" Thomas Looms.  
57 1 x 4 Box 36" Crompton Looms.  
5 3 x 1 Box Thomas Wood Looms.  
22 2 x 1 Box Bridesburg Looms.  
2 1 x 4 Box Clipper Looms.  
4 Clipper Terry Towel Looms.  
1 Cloth Roller Machine, (Woonsocket).  
168 2 x 1 Box Clipper Looms, English.  
22 3 x 1 Box Thomas Wood Looms.  
2 2 x 1 Box Thomas Wood Looms.  
45 Framers, 176 Spindles each, Saco W. P. Co.  
19 Framers, 176 Spindles each, Saco W. P. Co.  
1 Reel for Testing Yarn.  
1 Pair Grain Scales.  
1 Band Machine.  
1 Double Reel.  
1 Potter & Atherton Opener.  
2 Taylor, Lang & Co. Breaker Lappers.  
1 Parr, Curtis & Madely Breaker Lapper.  
2 Taylor, Lang & Co. Finisher Lappers.  
1 Parr, Curtis & Madely Finisher Lapper.  
1 Howard & Bullough Slasher.

- 8 Long Chain Beamers.
- 2 Lewiston Warpers.
- 5 Lease Warpers, (Lowell).
- 3 White Spoolers, (80 Spindles each).
- 4 White Spoolers, (100 Spindles each).
- 1 Drum Spooler, 36 Drums.
- 2 Woods Quillers, 30 Spindles each.
- 5 E. & P. Quillers, 76 Spindles each.
- 3 Fales & Jenckes Twisters, 16 Spindles each.
- 1 Twister, Saco W. P. Co., 160 Spindles.
- 1 Avery Band Machine.
- 2 Hetherington Reels, 80 Spindles each.
- 2 Saco Water Power Reels, 60 Spindles each.
- 1 C. A. Luther & Co. Bank Spooler, 362 Spindles.

Rope Machinery

- 1 Large Rope Machine, 4 Ply.
- 1 Small Rope Machine, 4 Ply.
- 2 Large Rope Machines, 3 Ply.
- 4 Large Rope Machines, 4 Ply.
- 1 Double Strand, Former & Creel.
- 4 Double Strands, Former & Creel.
- 1 White Spooler, 64 Spindles.
- 1 White Spooler, 74 Spindles.
- 1 Todd & Rafferty Rope Coiler.
- 1 F. A. Leigh & Co. Cotton Opener, 40".

- 3 Lord Lappers.
- 16 Mason Machine Co. Cotton Cards.
- 3 Mason 5 Delivery each Drawing Frames.
- 2 Mason Slubbers, 80 Spindles each.
- 1 Bronsfield Roller Grinder.
- 3 Shell Roller Grinders.
- 4 Bridesburg Railway Heads.
- 10 Spinning Frames, 140 Spindles each.

Mill No. 2

Total Spindles.....11,264 ring spindles  
Rope Works..... 1,400 ring spindles

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12,664

Total Looms.....386

No. 3 Mill

- 4 72" Rodney Hunt Turbine Water Wheels.
- 1 24" Hercules Turbine Water Wheel.
- 1 30" Hercules Turbine Water Wheel.
- 2 Rotary Fire Pumps.
- 140 40" Combination Cards (Saco Water Power Co.).
- 16 Railway Heads (Saco Water Power Co.).
- 33 Drawing Frames, 4 Deliveries (Saco Water Power Co.).
- 6 Slubbers, 64 Spindles each (Saco Water Power Co.).
- 3 Intermediate Frames, 80 Spindles each (Saco W. P. Co.).
- 20 Roving Frames, 120 Spindles each (Saco W. P. Co.).

- 4 Hardy Roller Slat Grinders.
- 6 Hardy Shell Grinders.  
Railway Troughs, for Cards.
- 1 Supply Pump for Tanks.
- 70 Spinning Frames, 176 Spindles each (Saco W. P. Co.).
- 24 Spinning Frames, 144 Spindles each (Saco W. P. Co.).
- 6 Mules, 804 Spindles each (Saco W. P. Co.).
- 1 Band Machine.
- 1 Pair Grain Scales.
- 1 Power Elevator.
- 1 Howard & Bullough Cylinder Slasher.
- 1 Lowell Cylinder Slasher.
- 1 Excelsior Dresser.
- 11 Long Chain Beamers.
- 3 Lewiston Warpers.
- 9 Lease Warpers (Lowell Machine Co.).
- 8 Sewing Thread Ball Winders.
- 4 Bank Spoolers, 364 Spindles each.
- 11 Quillers, 80 Spindles each.
- 12 Twister Frames, 160 Spindles each.
- 3 Drum Spoolers, 18 Drums each.
- 7 White Spoolers, 100 Spindles each.
- 8 White Spoolers, 80 Spindles each.
- 5 Reels, 60 Spindles each.
- 10 Cast Iron E. & P. Drawing-in Racks.

- 351 4 x 1 Box Side Lever Harness Motion Crompton Gingham Looms.
- 1 4 x 1 Box Underneath Harness Motion Crompton Gingham Loom.
- 36 1 x 1 Box Crompton Ticking Looms.
- 1 Cloth Roller or Inspecting Machine.
- 150 4 x 1 Underneath Harness Motion Crompton Looms.
- 115 4 x 1 Box Kenerson Head Motion Crompton Looms.
- 44 6 x 1 Underneath Harness Motion Crompton Looms.
- 40 4 x 1 Underneath Harness Motion 40" Crompton Looms.
- 24 4 x 4 P. & P. 34" Kenerson Head Motion Crompton Looms.
- 13 4 x 1 Box 36" Crompton Kenerson Head Motion Towel Looms.
- 4 4 x 1 Witch Engine 46" Crompton Looms.
- 1 Cloth Roller or Inspecting Machine.
- 1 Lap Head (Saco Water Power Co.).
- 4 Breaker Lappers, Kitsons.
- 6 Finisher Lappers, Kitsons.
- 2 Condensers.
- Trunks and Circles.
- 4 Kitson Openers.
- 1 Parr, Curtis & Madley Opener.
- 1 Howgate Dusting Machine.
- 1 Breaker Lapper for Colored Work.
- 1 Finisher Lapper for Colored Work.

Cotton Finishing Room

- 1 Power Elevator.
- 1 Granger Combination Roll Calendar.

- 3 Curtis & Marble Shearing Machines.
- 1 Rice, Barton & Fales Cylinder Cloth Dryer.
- 2 Cloth Folders (Woonsocket).
- 1 Harrison & Son Cloth Folder.
- 1 Cloth Calendar, 3 Roll (Mason).
- 2 Hydraulic Cloth Presses, R. B. & F.
- 1 Hydraulic Pump (Holyoke).
- 1 Cloth Winding Machine.
- 1 Cloth Folder.
- 3 No. 4 Dinsmore Sewing Machines.
- 1 English Drying and Sizing Machine.
- 1 Curtis & Marble Scratcher.
- 3 Brush Dynamos, 28 Arc Lamps each.
- 92 Arc Lamps.
- 3 4 x 4 Box Thomas Looms, with Kenerson Harness Motion.
- 1 4 x 4 Box Thomas Loom, with Plain Harness Motion.
- 3 1 x 4 Box Thomas Looms, with Kenerson Harness Motion.
- 1 1 x 4 Box Thomas Loom, with Plain Harness Motion.
- 4 1 x 1 Box Bridesburg Clipper Terry Towel Looms.
- 12 1 x 1 Box English Clipper Towel Looms.
- 12 1 x 4 Box English Clipper Jeans Looms.

Mill No. 3

Ring Spindles.....15,776  
Mule Spindles..... 4,824

Total Spindles.....20,600  
Total Looms..... 778

For All Mills

Total Spindles

No. 1 Mill proper.....10,560  
Woolen department..... 3,672  
14, 232  
No. 2 Mill proper.....11,264  
Rope works..... 1,400  
12,664  
No. 3 Mill.....20,600  
Grand total.....47,496

Total Looms

No. 1 Mill.....183  
Woolen department.....160  
343  
No. 2 Mill.....386  
No. 3 Mill.....778  

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Grand total.....1,507

Boiler House

- 7 5' x 61' Steel Tubular Boilers.
- 1 Large Dean Fire Pump.
- 1 No. 6 Supply Pump.

- 1 No. 7 Supply Pump.
- 3 Iron Tanks.
- 5 Gauge Cocks.

Office Building

- 3 Knowles Cloth Baling Presses.
- 1 Morse & Williams Power Elevator.
- 1 Large Platform Scale.
- 1 E. Howards Watchman's Clock with Stations Complete.
- 1 Yale Time Lock on Safe.

Machine Shop

- 1 Lathe, 52" Swing, 12' Bed.
- 1 Double Lathe, 26" Swing, 24' Bed.
- 1 Lathe, 18" Swing, 14' Bed.
- 1 Lathe, 16" Swing, 7' Bed.
- 1 Lathe, 20" Swing, 12' Bed.
- 1 Lathe, 16" Swing, 8' Bed.
- 1 Lathe, 14" Swing, 5-1/2' Bed.
- 1 Lathe, 14" Swing, 6' Bed.
- 1 Lathe, 10" Swing, 4' Bed.
- 1 Lathe, 12" Swing, 4-1/2' Bed.
- 1 Lathe, 14" Swing, 7' Bed.
- 1 Planer, 7' Bed.
- 1 Shaper, 15' Stroke.
- 1 Centre Machine.
- 1 Milling Machine.

- 1 7 H.P., Otto Gas Engine.
- 1 Large Cutting Machine, for Gear Cutting.
- 1 Small Gear Cutting Machine.
- 1 12" Emory Wheel, Stand & Arbor.
- 1 10" Emory Wheel, Stand & Arbor.
- 1 48" Grind Stone and Frame.
- 1 Shaft Straightening Device.

Carpenter Shop

- 1 Double Surfacer and Matcher.
- 1 Daniel Plainer, 26' Bed.
- 1 Mortising Machine.
- 1 Dove Tail Machine.
- 3 Rip Saws.
- 1 Swinging Cut-off Saw.
- 1 Turning Lathe, 12" Swing, 10' Bed.
- 1 Turning Lathe, 19" Swing, 17' Bed.
- 1 30" Re Saw.
- 1 Horizontal Boring Machine.
- 1 Scroll Saw.
- 1 Dowel Machine.
- 1 Box Board Edging Machine.
- 1 Double Cut-off Saw.
- 1 Emery Grinder.
- 1 Double Tenor Cope Machine.
- 1 6" Sticking Machine.

- 1 Poney Surface Planer.
- 1 Knife Grinding Machine (Planer Knives).

Dye House

- 2 8' Boiling Tubs with Rubber Rolls.
- 1 4' Boiling Tub.
- 4 5' Cement Lined Tubs.
- 1 6' Wash Tub.
- 1 6' Cloth Washer.
- 2 Souring Vats.
- 2 Cement Lined Bleach Tubs.
- 2 Cloth Washers.
- 2 Rice, Barton & Fales Extractors.
- 2 Short Skein Dye Boxes.
- 1 Old Cotton Opener.
- 1 Set Squeeze Rolls.
- 2 Wooden Cranes.
- 238 Warp and Wool Boxes.
- 2 8' Cotton Dye Tubs.
- 2 6' Cotton Dye Tubs.
- 2 6' Cutch Tubs.
- 1 6' Lime Tub.
- 3 Iron Dye Wood Extractors.
- 3 Long Chain Wooden Dye Machines with Rubber and Brass Rolls, &c.
- 9 Scotch Tubs with Rubber and Brass Rolls, &c.
- 2 Iron Scalding Boxes with Rubber and Brass Rolls, &c.

- 9 Short Skein Boxes.
- 1 8' Boiling Tub.
- 1 Delahunty Dyeing Machine.
- 1 8 H.P. Engine.
- 20 Iron Blue Vats with Rubber and Brass Rolls, and 20 Clutch Pulleys, &c.
- 1 12 H.P. Engine.
- 1 Large Splitter.
- 1 Small Splitter.
- 1 Doubler.
- 2 Butterworth, 18 Can Warp Drying Machines.
- 3 Iron Water Tanks, 16,000 Gallons.
- 2 Pairs Platform Scales.
- 3 Pumps.
- 1 C.A. Luther & Co., Printing Machine.
- 1 C.A. Luther & Co., Drying Machine.
- 1 18 Can Drying Machine.
- 1 Sargent Wool Dryer.
- 3 Small Warp Splitters.
- 1 Small Warp Doubler.
- 1 Print Machine.
- 9 Indigo Mills.
- 1 Sturtevant Blower and Dryer.
- 1 Wool Scoring Box.
- 1 Wool Washing Box.
- 8 6' Dyeing Vats for Wool.

- 3 6' Dyeing Vats for Wool.
- 8 Lap Dyeing Vats.
- 1 Hydro Extractor (worn out).
- 5 Lap Trucks.
- 2 Lap Trucks.
- 2 Iron Cranes.
- 1 Wooden Crane.
- 8 4' Iron Vats in Annex to Dye House.
- 1 18" Water Wheel at Reservoir.
- 1 10" Pump.

Pipe Cellar

- 1 Pipe Cutting and Threading Machine.

Waste Department

- 1 Underneath Screw Press.
- 1 Overhead Screw Press.

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Chattahoochee Knitting Mill (Girard, Ala.)

Mill Building, one-story, 102'x72'x13-1/2' high. Engine and Boiler House, one-story, 29-1/2'x23'. Engine 14'x12'.

- 13 Branson Knitting Machines (Old Style).
- 67 Branson Knitting Machines (Improved).
- 75 Bed Plates for Machines, at \$4.50 each.
- 1 Emery Wheel and Stand.
- 11 Looper Machines (in use).
- 5 Looper Machines (bad order).

- 3 Champion Sewing Machines.
- 21 Bransons Ribber Machines.
- 1 McM. & Wilburn Ribber Machine.
- 1 Quiller, 22 Spindles.
- 7 Quillers, 18 Spindles.
- 3 Quillers, 24 Spindles.
- 3 Steam Presses, 4'2" x 2'7"
- 1 Dynamo, 100 Lights.
- 1 Boiler, 30 Horse.
- 1 Engine, 25 Horse.
- 1 A.A. Water Pump.
- 1 Fire Pump, 4x10x4.

APPENDIX II: Inventory of Eagle and Phenix Equipment, 1905

(Quoted from Superintendent's Report to the President  
for the Year Ending May 31, 1905)

Commencing at the Northeast corner of the mill yard, we have a space of about 3,000 square feet, occupied by Stables for our mules and wagons. We have seven 2-mule wagons; two 1-mule wagons; one sanitary and two scavenger carts; fifteen mules. Two of these fifteen are in very poor condition, as they are very old. The rest are in good condition.

The upper yard almost surrounding the Stables, we have a space of about 15,000 square feet, which we use as a lumber yard, in which we generally carry from 30 to 50 carloads of lumber.

No. 1 Mill

Picking Room first floor, contains 3,320 square feet of floor space and two Kitson Openers with automatic feeders attached; two Kitson Breaker Lappers; two 2-beater Lord Brothers Intermediate Lappers; three Kitson Finisher Lappers.

Second floor contains 3,423 square feet of floor space and one set (23) 144-inch H. W. Butterworth and Sons Dry Cans and Store Room for Warps and Beams for Wool Weave Room.

Third floor contains 3,428 square feet of floor space and eight Woonsocket Nappers and one Portable Sewing Machine.

No. 2 Picker Building

Picking Department, first floor, contains 7,186 square feet of space and five Openers with automatic feeders attached. Three of these are used to clean cotton and transfer it through pipes to Dye House; two Kitson Breaker Lappers; three Kitson Intermediate Lappers; three Kitson Finisher Lappers.

Second floor, 2,958 square feet of floor space and one 44-spindle Higgins' Slubber, and one Samuel Brook's old Spinning Frame, 140 spindles.

Sample Room, Picker Building, 896 square feet of floor space.

Second floor, 2,124 square feet and is in use for putting up samples and for designing; contains four Sample Looms for getting out designs; one Spooler and Sample Warper.

No. 3 Picker Building

OPENING ROOM--This room contains 6,180 square feet of floor space, and in this room we have large bins for mixing cotton, and five Kitson and one Saco & Pettee Opener, each with automatic feeders attached.

Second floor, Lapper Room, contains 6,318 square feet of floor space, and five Kitson and one Saco & Pettee Breaker Lappers; also, two Kitson and eight Saco & Pettee Finisher Lappers.

Third floor contains 6,344 square feet of floor space, and twenty-six 40-inch Saco & Pettee Revolving Flat Cards; twenty-four deliveries of Saco & Pettee Metallic Roll Drawing; three 80-spindle Saco & Pettee; one 80-spindle Saco Water-power Slubber, and two 136-spindle, 7x3-1/2, Saco & Pettee Fly Frames.

No. 1 Mill, Main Building

Carding Department, second floor, contains 10,365 square feet of floor space; forty Pettee 40-inch revolving Flat Cards; forty-eight deliveries Howard Bullough Electric Drawing; two 72-spindle Saco & Pettee Slubbers; one 72-spindle Saco & Pettee Metallic Roll Slubber; two 84-spindle Saco Water-power Slubbers; six 120-spindle, 8x4, Saco Water-power Fly Frames; three 136-spindle, 7x3-1/2, Saco & Pettee Fly Frames.

No. 2 Mill, Main Building

Card room first floor contains 4,214 square feet of floor space, and thirty-eight Saco & Pettee 40-inch Revolving Flat Cards; forty-two deliveries Pettee Metallic Roll Drawing; five 72-spindle Saco & Pettee 10x5 Slubbers; one 80-spindle Saco Water-power 10x5 Slubber; one 52-spindle Lowell 10x5 Metallic Roll Slubber; eight 144-spindle Saco & Pettee 7x3-1/2 Fly Frames; one 120-spindle Saco Water-power 7x3-1/2 Fly Frame.

No. 3 Mill, Main Building

Carding Department, third floor, contains 28,365 square feet of floor space and ninety-two 40-inch Saco & Pettee Revolving Flat Cards; 110 deliveries of Pettee Metallic Roll Drawing Frames; two 80-spindle Metallic Roll Lowell Slubbers; six 72-spindle Saco Water-power Slubbers; seven 72-spindle Saco & Pettee Slubbers; one 80-spindle Saco Water-power Slubber; ten 120-spindle, 8x4, Saco Water-power Fly Frames; seven 120-spindle, 7x3-1/2, Saco Water-power Fly Frames; two 144-spindle Saco & Pettee Fly Frames, and eight 120-spindle, 8x4, Fly Frames.

No. 1 Mill, Main Building

Spinning Room, fourth floor, contains 10,552 square feet of floor

space and forty-four 176-spindle Saco Water-power Ring Spinning Warp Frames; sixteen 176-spindle Saco Water Power Spinning Filling Frames.

No. 2 Mill, Main Building

Spinning Room fourth floor, contains 11,130 square feet of floor space and fifty-six 176-spindle Saco Water-power Warp Spinning Frames, and five 176-spindle Saco Water-power Filling Frames.

No. 3 Mill, Main Building

Spinning Room, fourth floor, contains 28,734 square feet of floor space and seventy 176-spindle Saco Water-power Warp Ring Spinning Frames; twenty-four 144-spindle Saco Water-power Filling Ring Spinning Frames; fifty-six 176-spindle Saco & Pettee Filling Ring Spinning Frames; sixteen 224-spindle Saco & Pettee Filling Ring Spinning Frames.

No. 1 Mill, Main Building

Weave Room, third floor, contains 10,400 square feet of floor space and eighty Slide Tooth, 2x1 box, Heavy Side, 6-leg, 37-1/2-inch, Crompton Looms equipped with the Draper steel harness warp stop motions. Speed of all the above Looms 165 picks per minute, and all in good condition.

No. 2 Mill, Main Building

Weave Department, third floor, contains 11,130 square feet of floor space and 142 slide-tooth, 37-1/2-inch, 4x1 box Crompton (Parkhill) Looms, speed 156 picks per minute; 10 slide-tooth, 37-1/2-inch, 4x1 box Crompton Looms, with doffers attached, 156 picks per minute; 38 slide-tooth, 37-1/2-inch, 4x1 box Crompton Looms, with doffers attached, 150 picks per minute. All in good condition.

Weave Department, second floor, contains 10,972 square feet of floor space and 80 sliding-tooth, 37-1/2-inch, 4x1 box heavy side 8-harness Crompton & Knowles Jean Looms, speed 150 picks per minute; 64 slide-tooth, 37-1/2-inch, 2x1 box heavy 6-leg Crompton & Knowles Looms, speed 165 picks per minute; 22 slide-tooth, 37-1/2-inch, 4x1 box Crompton (Parkhill) Looms, 156 picks per minute; 24 Crompton slide-tooth, 37-1/2-inch, 4x1 box, speed 150 picks per minute. These last 24 Looms were originally Terry Towel Looms. All are in good condition.

No. 3 Mill

Weave Department, first floor, contains 30,434 square feet of floor space, and 112 Crompton & Knowles 4x1 box, 37-1/2-inch Looms, speed 156 picks per minute; forty-eight Crompton 2x1 box, 43-1/2-inch side Looms, speed 160 picks per minute; 118 Crompton 1x1 box, plain Looms, speed 118 picks per minute; sixty-two Crompton 1x1 box, plain Looms, speed 165

picks per minute; four Crompton-Thayer (samples) 4x1 box, 37-1/2-inch Gingham Looms, speed 156 picks per minute; 132 30-inch Draper Looms, speed 165 picks per minute; twelve 32-inch Draper Looms, speed 165 picks per minute; forty 34-inch Draper Looms, speed 165 picks per minute; all in good condition.

Filling room of No. 3 Mill contains 4,227 square feet of floor space.

Weave Department, second floor, contains 30,545 square feet floor space and sixty-eight Slide Tooth 6x1 box 37-1/2-inch Crompton & Knowles Looms, speed 152 picks per minute; two hundred and sixty-four Slide Tooth 4x1 box, 37-1/2-inch Crompton & Knowles Looms, speed 156 picks per minute; one Crompton Loom Lock Box 4x1 box 37-1/2-inch, speed 156 picks per minute; forty-seven Crompton Looms Lock Box 4x1 box 43-1/2-inch, speed 156 picks per minute; one Plain 1x1 box 43-1/2-inch Crompton Loom, speed 156 picks per minute; one hundred and forty Model "E" Draper Looms, 30-inch, speed 165 picks per minute; four Model "E" Draper Looms, 32-inch, speed 165 picks per minute.

#### Wool Mill

Weaving Department, second floor, contains 9,727 square feet of floor space and seventy-six Crompton & Knowles, 4x1 box, 37-1/2-inch, heavy 8-harness Jean Looms, speed 152 picks per minute; sixteen Crompton & Knowles, 4x1 box, 40-1/2-inch, heavy 8-harness Jean Looms, 152 picks per minute; fifty-eight Crompton & Knowles, 2x1 box, heavy 8-harness 37-1/2-inch Looms, 152 picks per minute; sixteen Parkhill gingham Looms, speed 152 picks (need new box motions).

#### No. 1 Mill, Main Building

Dressing Department, fifth floor, contains 10,653 square feet of floor space and five Lowell Beam Warpers; two Lowell Lease Warpers; two Lowell Slashers; two 100-spindle Draper Spoolers; two 80-spindle Draper Spoolers; two 100-spindle Whitin Spoolers; one 80-spindle Whitin Spooler; and twenty 144-spindle Lowell Warp Spinning Frames.

#### No. 2 Mill, Main Building

Dressing Department, fifth floor, contains 11,183 square feet of floor space and two 378-spindle Whitin Quillers; three 100-spindle Draper Spoolers; four 100-spindle Whitin Spoolers; six Lowell Lease Warpers; one Draper Beam or Lease Warper; four Entwistle Beamers; four Draper Unwinders; one Lowell Slasher; one Howard & Bullough Slasher; five E.&P. Drawing-in Racks; one J. G. Avery Band Machine; one 12-spindle Universal Cone Winder.

### No. 3 Mill, Main Building

Dressing Department, fifth floor, contains 28,954 square feet of floor space, and twelve 160-spindle Saco Water-power Twisters; three 160-spindle Fales & Jenks Twisters; six 100-spindle Whitin Spoolers; seven 80-spindle Whitin Spoolers; four 30-spindle Silver & Gay Ball Winders; three 16-spindle Silver & Gay Ball Winders; one 28-spindle E. & P. Ball Winder; one 364-spindle C. A. Luther Bank Spooler; one 96-spindle C. A. Luther Sizing Machine; seven C. A. Luther Drawing-in Racks; eight Lowell Beam Warpers; four Lowell Lease Warpers; three Lowell Slashers; one Cohoes Slasher; one Howard & Bullough Slasher; seven Entwistle Beamers; four Draper Unwinders; one E. & P. Band Machine; one E. & P. Quiller.

### Finishing Department

First floor contains 5,304 square feet floor space and three Rice, Barton & Fales Hydraulic Presses; two Woonsocket Folders; two Curtis & Marble Folders; two Curtis & Marble Rolling Machines; one Granger 4-roll Calendar, one Granger 3-roll Calendar; one H. W. Butterworth Tenterer; one Hardy Shear Grinder; one Standard Sewing Machine.

Second floor contains 5,407 square feet floor space; three Curtis & Marble Shearing Machines; four Dinsmore No. 4 Sewing Machines; two Dinsmore Portable Sewing Machines; seven Woonsocket Nappers; two 24-roll Borchers' Nappers; one Dronsfield Napper Grinder.

Over No. 1 Picker Room (mentioned in No. 1 Mill) one set (23 cans) Butterworth Dry Cans; eight Woonsocket Nappers.

Over Boiler House contains 8,771 square feet of floor space and one set Granger (23) Dry Cans, 72-inch; one set Granger (23) Dry Cans, 54-inch; one 90-foot Tenterer, daily capacity of 100 pieces; one Vertical Curtis & Marble Brusher; and two Dinsmore Portable Sewing Machines.

### Wool Building

Finishing Room, first floor, contains 9,727 square feet of floor space and two Woonsocket Double Nappers; one Woonsocket Single Napper; one Parks & Woolson Double Cylinder Shear; one Curtis & Marble Single Cylinder Shear; one David Gessner Rotary Steam Press; one Curtis & Marble Cloth Roller; one Parks & Woolson Cloth Brush; also, one 480-spindle Davis & Furber Wool Mule; one 336-spindle Davis & Furber Wool Mule; one 288-spindle Davis & Furber Wool Mule; one 20-spindle Rewinder.

### No. 1 Mill, Main Building

Wool Department, first floor, contains 10,098 square feet floor space, and three James Smith Breaker Cards; six Cleveland Bros. Breaker

Cards; two David & Furber Breaker Cards; one James Smith Finishing Card; eight Cleveland Bros. Finishing Cards; and Davis & Furber Finishing Card; one 480-spindle Davis & Furber Woolen Mule; five 336-spindle Davis & Furber Woolen Mules. Other Mules in Finishing Department.

#### Girard Mills

Spinning Room, contains 7,968 square feet of floor space and thirteen Lowell Ring Spinning Filling Frames, 224 spindles each; fifteen Lowell Ring Spinning Warp Frames, 224 spindles each; two Saco & Pettee Ring Spinning Warp Frames, 224 spindles each; four 64-spindle Old Style Whitin Spoolers; one Geo. W. Payne Rewinder, 20 spindles; one Weeks Banding Machine; three Lowell Beam Warpers.

Girard Opening Room, contains 1,555 square feet floor space, and two Kitson Openers, with self-feeders attached and mixing room.

Girard Lapper Room second floor, contains 1,612 square feet of floor space and two 45-inch Kitson Breaker Lappers and two 45-inch Kitson Finisher Lappers.

Girard Card Room, second floor, contains 8,136 square feet of floor space and twenty 45-inch Lowell Revolving Flat Cards; twenty-four deliveries Pettee Metallic Roll Drawing; two 68-spindle Saco Water-power 10x5 Slubbers; one 72-spindle Saco Water-power 10x5 Slubber and six 120-spindle Saco Water-power Fly Frames. Motor Room floor space, 786 square feet. Filling Room floor space, 1,482 square feet. Warehouse, floor space, 6,969 square feet, capacity six hundred bales of cotton.

Weave Department, contains 14,976 square feet of floor space and one hundred Slide Tooth 37-1/2-inch 4xl box Crompton & Knowles Looms; seven Slide Tooth 37-1/2-inch 4xl box Crompton Looms, (Parkhill); forty Slide Tooth 37-1/2-inch 4xl box Crompton Looms, new box motions recently attached (good Looms); sixty-five improved lock box 37-1/2-inch 4xl Crompton Looms, (good); 40 old style lock box 37-1/2-inch Geo. Crompton Looms, (old, not much good, very hard to keep running); four plain Crompton Looms, (these Looms were made from our old Check Looms); total number two hundred and fifty-six; one Slasher; two Drawing-in Racks; one Humidifier Pump; one Sanitary Pump; one grindstone. Girard Mill and Warehouse contains one acre of floor space.

#### Electrical Plant

Three G.E. Co. Reduction Motors, Type "IQ" form "L"; Class 12, 100, 600 volts; 2,080 amperes, 23 cycle, speed 600.

Two 15-K.W. Generator Electrical Transformers, oil-cooled, 2,080 volts to 115 volts.

### Rope Building

Picker Room, first floor, contains 834 square feet of floor space and one Lord Bros. Breaker Lapper, and two Saco & Pettee Finishers.

Rope Spinning Room, first floor, contains 1,668 square feet of floor space, and nine 140-spindle Samuel Brooks Common Spindle Ring Spinning Frames.

Rope Carding, second floor, contains 2,727 square feet of floor space, and sixteen 40-inch Lowell Fancy Revolving Flat Cards; fifteen deliveries of Mason's Metallic Roll Drawing Frames, and two 80-spindle 10x5 Slubbers.

Filling Room, third floor, contains 2,727 square feet of floor space, and is used to store and age filling for Nos. 1 and 2 Weave Rooms.

### Rope-Making Department

Rope Room contains 4,214 square feet of floor space, and one Haskell-Dawes No. 2 Rope Machine, 12x14, double-flyer, 4-ply; two Haskell-Dawes, 12x14, Formers; one Haskell-Dawes, 12x14, Layer; two Haskell-Dawes, 8x10, Layers; one Haskell-Dawes No. 3 Rope Machine, 8x10, double-flyer, 4-ply; two Haskell-Dawes, 8x10, Formers; one Haskell-Dawes, 12x14, Layer; two Haskell-Dawes, 8x10, Formers; one Haskell-Dawes, 8x10, Layer; two Haskell-Dawes, 5x10, Formers; one N. C. Boone Rope Machine, double-flyer, 4-ply; two N. C. Boone 5x8 Formers; one Double Coiler; one Todd Coiler; one Carsed Auto. Coiler; two Spoolers.

### Dye House

Dye House contains 35,812 square feet of floor space, 2-story, divided as follows: Wheel House, 1,350 square feet; Scalding Room, 2,812; Long Chain, 2,888; Raw Stock, 6,675; Indigo, 5,550; Long Chain Dry Room, 2,137; Press Room, 7,200; Cyclone Dryers, 7,200; and the following machines, etc.: One Long Chain Boiling Off Box or Scalding, will boil off twenty-four Warps at one time; one Double, doubling as many as forty strands; one Long Chain Splitter, made for twenty strands; six large Scotch Tubs, 250 to 275 gallons capacity; three small Scotch Tubs, 225 to 250 gallons capacity; one Rectangular Dye Tub, 250 to 275 gallons capacity; eight pair Long Chain Indigo Vats; two Butterworth 18-cylinder Can Dryers; eight Short Skein Indigo Vats; two Skein Dyeing Vats, used for indigo samples; one Indigo Crinding Machine for preparing and preserving indigo stock liquor.

Raw Stock Department; three Vacuum Machines; six Klauder-Weldon Dyeing Machines; two Delahaunty Dyeing Machines; five Cyclone Dryers; eight 48-inch Extractors; five Cotton Presses; four Kitson Automatic Feeders; one Sargent Automatic Feeder; five Washing Tubs; six Sturtevant

Fans; one Tramway for Vacuum Dyeing Machines.

#### Machine Shop Building

Contains 12,768 square feet of floor space, two-story, and the following machinery: One Opener and Feeder for Rope Department; two Howgate Dusters; one James Smith Garnett; one C. G. Sargent Burr Picker; one James Smith Oil Picker; one 2-beater Saco & Pettee Breaker Lapper, and one single-beater Saco & Pettee Finisher Lapper for Wool Department.

Mashine Shop: One Universal No. 2 Milling Machine; one Power Feed Gear Cutter; two Reed Back-gearred Engine Lathes, 10-inch swing, 5-foot bed; one Power Shear; one Belt-driven Cushion Hammer; one Hand-lever Punch; two Double Emery Grinders; one Pond Engine Lathe, 13-inch swing, 5-1/2-foot bed; one Pond Engine Lathe, 15-inch swing, 8-foot bed; one Blaisdell Engine Lathe, 16-inch swing, 11-foot bed; one Blaisdell Engine Lathe, 17-inch swing, 6-foot bed; one Lathe and Morse-speed Lathe, 12-inch swing, 4-1/2-foot bed; one Blaisdell Vertical Drill Press, 18-inch table; one Niles Tool Work Vertical Drill Press, power feed, square table; one Roll Filling Machine; one 26-inch by 26-inch Single Head, Iron-gearred Plainer, 50"x5'6" table; one Back-gearred Engine Lathe, 52-inch swing, 12-1/2-foot bed; one Sturtevant No. 2 Cupola Blower; one Grindstone, iron frame; one Double Bolt Cutter; one Plain Milling Machine; one Engine Lathe, 16-inch swing, 7-foot bed; one Engine Lathe, 18-inch swing, 16-foot bed; one Engine Lathe, 14-inch swing, 15-foot bed, double-head screws, sliding rests, feed rods, making two lathes in one (new); one Engine Lathe, 20-inch swing, 12-foot bed; one Hand-power Shear; one Centering Machine; one portable hand Key-seating Machine; one 15-inch Spoke Shaper; one No. 1 Key-seating Machine; one Engine Lathe, 28-inch swing, 28-foot bed; one Champion hand Forge and Blower; one Power Pipe Threading Machine; one Hand-power Pipe Threading Machine.

Boiler House, 8,112 square feet of floor space; four 200 Horse-power Boilers; one No. 6-1/2 Dean Steam Boiler Feed Pump; one No. 7 Holyoke Steam Boiler Feed Pump; one Auxiliary Light Plant, consisting of one 2-K.W. Dynamo, and 8-horse Power Vertical Engine; and a complete set of Machinist and Tinsmith Tools, including a first-class Brazing Plant.

#### Carpenter Shop

Carpenter Shop, contains 5,439 square feet floor space, and one Westside Iron Works, Grand Rapids, Michigan, Band Saw, with four extra Saws; one Boults Dove Tailer; one Emery Grinder; one Iron Table Combination Saw Table; one Buzz Planer, sixteen Knives; one Resaw, will cut 12-inch boards; one Rip-saw Table; one Ball Turning Machine; one Ball Sticking Machine; one Rod Machine; one Double Cut-off Saw Table; one Box Maker's Rip-saw; one 24 Inserted-toothed Saw and Table; one Swing Cut-off Saw; one Martising Machine; one Glen Core; four Side 8x24 Plane; one Whitney 4x24 Pony Planer; one Grinding Stone. The Pattern House is

a three-story building; each floor 1,148 square feet and contains many patterns.

#### Electrical Department

Light and Power House, 2-story, 5,180 square feet floor space; one G.E. Co. Generator, type "M.P.," class 4-65-875, form "H" ap. 520, speed 875, volts 125, weight 7,665 pounds; two G.E. Co. Generators "M.E." type, etc., form "H," weight 5,486 pounds; one G.E. Co. Generator, same type, etc., form "A," weight 5,486 pounds; one Stanley Electrical Manufacturing Company Generator No. 805, type 7, 2-p., volts 2,400; 192 K.W., speed 600 cycles 60; one Northern Elec. Co., Exciter, 120 volts, 24 amps. 3 Q.W., speed 110, one G.E. Alternator, volts 2,300, amps 16, speed 900, compound wound, 60 cycles, type "A.Q."; one G.E. Co. Exciter, 125 volts, 2 amps, type "I.B.," speed 1,900, form "F"; one Gen. Electric Co. Generator, type "M.P.," class 4-35-975, form "A," amps 280, volts 125, speed 975 (not in use); one 3-wire Switch Board for light circuits; one S.K.C. System Switch Board 2,400 volts, 4 Girard Circuit; one Lombard Water Wheel Governor, type "B," No. 446; one G.E. Co. Transformer 1-5 K.W., oil-cooled, 2,080 to 115 volts; one S.K.C. System Motor, 2,400 volts, 86 H.P., 60 cycles, 2 phase, speed 900 (not in use).

APPENDIX III: Eagle & Phenix Division Cotton Mill Machinery

(From typescript in EPCR, dated December 20, 1963)

Carding

16	Lummus Blending Feeders (Opening Room)	
5	Whitehead Blending Feeders (Color Room)	
8	Saco-Lowell One-Process Pickers	
1	Aldrich One-Process Picker (Color Room)	
207	Cards (57 H&B, 137 Saco-Pettee, 13 Saco-Lowell)	
26	H&B Cards (Color Room)	
40	Deliveries Ideal Feathertouch Drawing	
52	Deliveries 3/4 Saco-Lowell Drawing	
36	Deliveries Ideal Drawing (Color Room)	
4	Saco-Lowell Sliver Lappers	
28	Saco-Lowell Combers	
19	10x5 Whitin Super Draft Roving Frames - 1,866 Spindles	
6	12x6 Whitin Long Draft Roving Frames - 432 Spindles	
5	14x7 Whitin Model P Roving Frames - 432 Spindles	
3	10x5 Whitin Super Draft Roving Frames - 294 Spindles (Color Room)	

Spinning

32	H&B Warp Frames Roberts Changeover	7,680 Spindles
22	Saco-Lowell Warp Frames, Boulogny Changeover	5,280 Spindles
1	H&B Warp Frame, Cleanguide Changeover	252 Spindles
31	H&B Warp Frames, Roberts Changeover	7,764 Spindles
32	H&B Warp Frames, Boulogny Changeover	8,064 Spindles

19	Whitin Warp Frames, Bouligny Changeover	4,548 Spindles
1	Whitin Warp Frame, Cleanguide Changeover	240 Spindles
16	Saco-Lowell Warp Frames, Roth changed to Duo-Roth	4,416 Spindles
<hr/>		
154	Total Warp Frames	38,244 Warp Spindles
24	Saco-Lowell Roth Filling Frames (5th Floor)	7,680 Filling Spindles
		45,924 Total Spindles

Yarn Preparation

4	Barber-Colman Spoolers - 900 Spindles
3	Barber-Colman Warpers
7	Abbot Quillers - 700 Spindles
2	Schlafhorst Quillers - 69 Spindles
1	Scharer Quiller - 10 Spindles
8	H&B Beam Twisters - 1,472 Spindles
6	Whitin Bobbin Twisters - 1,200 Spindles
2	Barber-Colman Tailing Machines - 36 Spindles
1	Foster Winder - 100 Spindles
1	Barber-Colman Starter Maker - 12 Spindles

Dyeing

2	Morton Rawstock Tubs - 1,000 Pound capacity each.	
1	Morton Rawstock Tub - 150 Pound capacity.	
4	Smith-Drum Machines, 2 Kiers each.	8 Kiers
2	Smith-Drum Machines, 3 Kiers each.	6 Kiers

1	Smith-Drum Machine, 1 Kier.	1 Kier
1	Gaston County Machine, 6 Kiers.	6 Kiers
		<hr/>
		21 Total Kiers

1 Smith-Drum Machine - 16 Cheese Capacity.

#### Slashing

1 West Point 9 Cylinder High Pressure Cans - 56 Pounds  
1 West Point 7 Cylinder High Pressure Cans - 56 Pounds  
1 Cocker 9 Cylinder - 35 Pounds Pressure Cans  
1 Barber-Colman Drawing-in Machine - 16 Harness Capacity  
1 Barber-Colman Drawing-in Machine - 8 Harness Capacity

#### Weaving

400 50" X-2 Looms  
112 50" C-3 Cam Looms  
50 C-3 Dobby Looms  
100 50" XP Dobby Looms  
165 44" K Model Looms  
96 46" K-G Model Looms

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923 Total Looms

#### Cloth Room

1 Curtis & Marble Brusher & Shearer  
3 Curtis & Marble Folders  
2 Curtis & Marble Stitchers

- 2 Curtis & Marble Cloth Winders
- 13 Vertical Inspecting Machines
- 12 Horizontal Inspecting Machines

APPENDIX IV: Equipment in the Power Houses, 1977

(Equipment specifications from Exhibit M before the Federal Power Commission, Application for License by Reeves Brothers, Incorporated, for Eagle and Phenix Mills dam, Columbus, Georgia, 1967.)

Upper Power House

- 4 54-inch Holyoke Hercules Vertical Water Wheels (1899-1900), each rated to develop 790 horsepower at 27 feet of head at 120 rpm. - They are set in open flumes; with draft tubes.

Gates to Turbines

- 2 Steel Slide Head Gates, one 11'0" x 12'0" and one 11'0" x 11'0", with rack and pinion hoist, also connection for motor drive.
- 1 Wood Slide Head Gate, 11'0" x 11'0", with rack and pinion hoist, also connection for motor drive.

Generators

Unit #1 - General Electric vertical generator (1907), 500 amps, 3-phase, 60-cycle, @ 120 rpm, 600 volt AC, 400 kW capacity, serial #150699 -- direct connected to a 152-amp, 125-volt DC exciter.

Unit #2 - Allis-Chalmers Manufacturing Company vertical generator (1914), serial #104330, 602 amps, 3-phase, 60-cycle, @ 120 rpm, AC 600 volt, 500 kW capacity -- direct connected to a 216-amp, 125-volt DC exciter.

Units #3 and #4 (1914) - serial #s 152893, 154027, Allis-Chalmers, 689 amps, 3-phase, 60-cycle @ 120 rpm, 580 kW capacity, each direct connected to a 216-amp, 125-volt DC exciter.

Switch Board

- 1 18-panel Distribution Panel Board for control of generators, station services, and feeders to plant.

Miscellaneous electrical equipment, including transformers.

Lower Power House

- 2 54-inch Holyoke Vertical Water Wheels (units #5 and #8), 790 horsepower at 27 feet of head, 120 rpm. Turbines are fed through steel penstocks and are provided with Holyoke improved governors and other auxiliary equipment.

- 3 48-inch Holyoke Vertical Water Wheels (units #6, #7, #9), 580 horsepower at 27 feet of head, 120 rpm. Turbines are fed through steel penstocks in tandem with units #5 and #8, and are also provided with Holyoke improved governors.

#### Gates to Turbines

- 2 Steel Slide Head Gates, 11'0" x 12'0", with rack and pinion hoist, also connection for portable motor drive.
- 1 Wooden Slide Head Gate, 11'0" x 8'0", with rack and pinion hoist, also connection for portable motor drive.

#### Generators

- (No. 5 Generator) - 1 General Electric Co. Serial #305873 - 500 kW, type TRC, Form DV, P.F. 80%, 120 rpm, 60 cycles AC, 3 phase, 600 volts, 600 amps. (Separately excited.)
- (No. 6 Generator) - 1 General Electric Co. Serial #305913 - 400 kW, type TRC, Form DV, P.F. 80%, 120 rpm, 60 cycles AC, 3 phase, 600 volts, 480 amps. (Separately excited.)
- (No. 7 Generator) - 1 General Electric Co. Serial #305914 - 400 kW, type TRC, Form DV, P.F. 80%, 120 rpm, 60 cycles AC, 3 phase, 600 volts, 480 amps. (Separately excited.)
- (No. 8 Generator) - 1 General Electric Co. Serial #305874 - 500 kW, type TRC, Form DV, P.F. 80%, 120 rpm, 60 cycles AC, 3 phase, 600 volts, 600 amps. (Separately excited.)
- (No. 9 Generator) - 1 General Electric Co. Serial #305915 - 400 kW, type TRC, Form DV, P.F. 80%, 120 rpm, 60 cycles AC, 600 volts, 480 amps. (Separately excited.)

#### Switchboard

- 1 8-panel board for generator and exciter control.
- 1 7-panel switchboard 12 KV controls for D.C. remote operation. 4 panel manual operated Air Circuit Breakers for feeder controls, 600 V.

Miscellaneous electrical equipment includes transformers, exciters.

Addendum

Eagle & Phenix Mill/Powerhouses  
Front Avenue  
Columbus  
Muscogee County  
Georgia

HAER No. GA-30

HAER  
GA  
108-Colum  
17-

REDUCED COPIES OF MEASURED DRAWINGS

Historic American Engineering Record  
National Park Service  
Department of the Interior  
Washington, D.C. 20240

ADDENDUM TO:  
EAGLE & PHENIX MILLS  
Front Street (1200-1300 Blocks)  
Columbus  
Muscogee County  
Georgia

HAER GA-30  
*HAER GA, 108-COLM, 17-*

COLOR TRANSPARENCIES

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001