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## **The Klotz Throwing Company in Lonaconing: Opening Tut's Tomb**

Rebecca M. Trussell

"At last have made a wonderful discovery in valley, a magnificent tomb with seals intact": Howard Carter described the opening of Tut's tomb. Carter's experience is so familiar to me, I need only to change a few words: "Darkness and blank space—but presently, as my eyes grew accustomed to the light, details of the room within emerged slowly . . . strange machines, bobbins, and silk—everywhere the gloss of silk . . . Packed tightly were scores of objects, any one of which would have filled us with excitement."<sup>1</sup>

One hundred forty miles northwest of Washington, D.C., where Dans Mountain stands about 3,000 feet above Western Maryland's bituminous coal fields, the Georges Creek Coal and Iron Company established the town of Lonaconing in 1835. Seventy-five years later the population of mostly coal miners and their families exceeded 2,000. The Klots Throwing Company erected a silk mill in Lonaconing in 1905, which closed its doors in 1957, and has stood for nearly a hundred years to become both monument and tomb for the Queen of fibers. This field report describes early twentieth-century silk yarn production *in situ*.

Silk industry barons of the Gilded Age chose remote mountain locations for their mills, and the Allegheny Mountains sheltered the Lonaconing mill for nearly half a century. Dark windows in its red brick building obscure the treasure within: 48,000 square feet of mill floor supporting over 360 machines built for twisting, winding, and spinning silk filaments, with yarn still wound on their bobbins and swifts; substantial steam and drying chambers and heavy iron centrifugal extractors, tons of parts, and millions of accessories. Provenance is etched on steel and cast in iron: "The Columbian" single- and double-deck Atwood winders; Toledo Scales; Westinghouse motors, and Crouse Hinds conduit; centrifugal pump and humidifying system by Buffalo Forge, and extractor from Tolhurst Foundry in Troy, New York. Paperwork is stacked in drawers, tacked to beams, and wedged between things: with soaking formulae, production notes, or just repair schedules. A calendar-sized board nailed to a beam has tiny lot-numbered skeins hung all over the surface; the gloss of rayon or the pearl of silk shine through fifty years of soot. The machine shop lathe reads "1861." Accessories read "1880."

Work benches, tables, and chests of drawers are stocked with sundry medicines like eyewash, mercurochrome, and spirits of ammonia. Even the workers' toilets suggest something of their world: eight stalls shared two rolls of paper, mounted on the outside. Faded, gaudy, umbrellas are tucked everywhere and women's shoes—perhaps thirty pair—are hung on spindles and tossed into tag bins. They are all early fifties style, with pointed toes, chunky heels, and well-creased insteps, thrown aside by workers after eight or more hours of moving up and down the mill aisles. What took place here?

The word "throwing" comes from the Anglo-Saxon word "thrawn," which means "to twist," and describes the production of yarn from raw silk. In 1905, when the United States consumed nearly twice as much silk as France, Japan reported the highest output

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1 After long searching, in 1922 Howard Carter discovered the tomb of Egyptian King Tutankhamen (c 1370-1352 BCE) and cabled an enraptured description to his patron, Lord Carnarvon.

of raw silk (9,550 metric tons), followed by Italy (6,380 metric tons), and China (3,530 metric tons). By 1908, China's output began to surpass that of Italy.<sup>2</sup>

Workers in silk filatures used basins of steamy water to soften cocoons and then reeled their double filaments, several at a time, onto swifts and then formed the silk into skeins of 80 to 100 grams each. Fifty to sixty of these were combined in bundles called "books," then packed together in bales weighing from about 107 to 220 lbs., depending on the country of origin.<sup>3</sup> When the bales arrived at the throwing mill, they were opened, weighed, inspected for quality, and the skeins were loosely tied. To remove the sericin coating the filaments, mill workers soaked the skeins for several hours in warm water, with soap, oil, glycerin, perfume and other agents. Water was removed by mechanical extraction, or "whizzing," and the skeins were dried, and stretched around octagonal maple reels, or swifts, supported by elastic cotton bands. The silk was wound off onto spools and twisted, if it was to become tram, or filler yarn. If was to be made into organzine, or warp yarn, it was spun and then "doubled," or combined with one or more other yarns and spun again. Each process determined the strength, heaviness, and texture of the finished yarn.<sup>4</sup>

By 1910, the United States had become the world's leader in thrown silk production, with over two million spindles operated by over 52,000 workers, which yielded an output of about 10,000 metric tons per year.<sup>5</sup> Much of this total was produced in silk throwing mills sited above the anthracite, or hard-coal, fields of Northeastern Pennsylvania where the availability of fuel, and cheap labor combined with easy access to rail transportation to make these locations highly profitable for mill owners.<sup>6</sup>

Henry Durell Klots and George Klots were throwsters in New York during the 1880s. After a mill fire in 1894, the brothers incorporated in the State of New Jersey as the Klots Throwing Company. Klots expanded its operations to Carbondale, Pennsylvania, at the suggestion of company secretary Marcus Frieder, a talented Hungarian businessman who had immigrated to America in 1890, and soon became manager of the company.<sup>7</sup>

Henry D. Klots was prominent in the Silk Association of America, and belonged to the Princeton, Manhattan, and New York Yacht Clubs, while keeping company offices on Broadway in New York, and in Paterson, New Jersey. Frieder, who lived in Carbondale, was responsible for Company expansion from Carbondale into Scranton, Archbald, and Forest City in Pennsylvania; Cumberland and Lonaconing in Maryland; Alexandria and Fredericksburg in Virginia, and Keyser, West Virginia.<sup>8</sup>

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2 Giovanni Federico, *An Economic History of the Silk Industry, 1830-1930* (Cambridge: University Press, 1997), Table 2.1, 11.

3 James Chittick, *Silk Manufacturing and Its Problems* (New York: James Chittick, 1913), 140.

4 Klotz Silk Throwing Co., Production Records, Private Collection, Lonaconing, Maryland. See also: Luther Hooper, *Silk. Its Production and Manufacture* (London: Isaac Pitman & Sons, Ltd., 1919), 37-47.

5 Giovanni Federico, *An Economic History of the Silk Industry, 1830-1930* (Cambridge: University Press, 1997), 12.

6 Chittick, *Silk Manufacturing and Its Problems*, 69-70.

7 *National Cyclopedia of American Biography*, vol. 30: 94. See also: Accession 1834, Klots Throwing Company Records, Hagley Museum and Library, Wilmington, Delaware, New York Correspondence.

8 Bonnie Stepenoff, *Their Fathers' Daughters: Silk Workers in Northeastern Pennsylvania, 1880-1960* (Selinsgrove: Susquehanna University Press, 1999), 40, 41. Also: *National Cyclopedia of American Biography*, vol. 30: 94.

Pierre S. Dupont of E. I. Dupont de Nemours & Co. in Wilmington, Delaware, purchased blocks of Klots preferred stock, and bonds, through the agency of his uncle, Henry Belin, Jr., who kept an office at Dupont in Scranton and was one of the Directors of Klots Throwing Company by 1908. Henry's son, Gaspard d'Andelot Belin, became the Klots treasurer by 1918.<sup>9</sup>

In 1908, Klots claimed assets of over \$1,000,000, a number that nearly doubled in ten years. Commissions for silk throwing grossed over \$2.5 million in 1908, and net earnings were nearly \$500,000.<sup>10</sup> As a commission house, Klots need only to invest in wages and maintenance, and was free of the risk of holding expensive inventory in raw or thrown silk. All profits could be reinvested in plants and business expansion. In 1912, the company listed seven throwing mills and a plant for manufacturing silk covering for wire at Passaic, New Jersey. Frieder advanced from general manager to president upon the death of Henry Klots in 1914, and in 1916 acquired the entire stock of Villa Stearns Company, a silk import firm that Klots had helped to organize. That company's chief executive, J. H. Britton, became vice-president of Klots Throwing Company, which listed New York offices on Fourth Avenue along with Villa Stearns.<sup>11</sup> Villa Stearns was renamed General Silk Importing Company, and Frieder erected an office and inspection building in Yokohama. After an earthquake in 1923 destroyed the building, the raw silk agency was moved to Kobe, Japan. Frieder knew the risks of silk importing, but believed that dealing in raw silk would allow his company to command a constant amount for its own mills. Correspondence throughout Lonaconing's period of productivity verifies that any lack of raw silk caused damaging losses, labor walk-outs, and irate customers.

In 1917 Klots Throwing Company built the largest and most modern spun silk mill in the U. S., National Spun Silk Company in New Bedford, Massachusetts, and then acquired General Fabrics Corporation with its silk weaving mill in Central Falls, R.I. In 1921, Frieder established General Silk Dyeing Company in New Bedford. During World War I, National Spun Silk devoted 92 per cent of its production to the manufacture of parachutes, and the company diversified to produce shock-proof parachute boxes.<sup>12</sup>

In 1927, Frieder consolidated his acquisitions in the General Silk Corporation, a holding and merchandising company. At its peak, Klots Throwing Company, with its New York office on Seventh Avenue, expanded to employ 6,000 workers in 14 mills generating sales of about \$50 million. With the introduction of Rayon, however, Klots mills increasingly fulfilled more orders for this "artificial silk." Declining profits and the Great Depression led to bankruptcy and liquidation in 1932, and the subsequent purchase

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9 Pierre S. Dupont Papers, 1880-1954. Klots Throwing Company. Hagley Museum and Library, Wilmington, Delaware.

10 Ibid.

11 *Dockham's American Report and Directory of the Textile Manufacture and Dry Goods Trade*. (Boston: C.A. Dockham).

12 *National Cyclopaedia of American Biography*, vol. 30: 94. From 1915 to 1921, the General Silk Importing Company was the largest American importer and seller of raw silk. Supportive documents are in: P. S. Dupont Papers, Klots Throwing Company, Correspondence September 1908-January 1915, Preferred Stock Offering, published by Brooks & Company, N.Y., Hagley Museum and Library, Wilmington, Delaware. Also, General Silk Corporation letterheads were printed on the back of cable forms bearing addresses of the filatures and offices in Shameen Canton, Shanghai, and Yokohama, in: Klotz Silk Throwing Co., Production Records, Private Collection, Lonaconing, Maryland.

of the mills in Carbondale, Penn., and Cumberland and Lonaconing, Md., by Marcus Frieder and his son Leonard P. Frieder—who operated them as General Textile Mills, Inc. Marcus Frieder also served in different periods as president of Carbondale Knitting Mills Co., and secretary of Empire Silk Co., of Paterson, N.J., and Wilkes-Barre and Carbondale, Penn., and was a director of United States Testing Co. Declining orders, increased competition for workers, and labor difficulties, eventually led to the closure of the Lonaconing mill in 1957.<sup>13</sup>

Recapturing the earliest history of Lonaconing's mill, when silk comprised most of the orders, has literally meant turning things upside down. Very early printed matter was fortuitously trapped in the gutters of letter files that were emptied to be re-filled with other records at mid-century. Documents from the earliest years were recycled during later decades when new information and carbon copies were printed on the backs. Carbon copies and original correspondence evidence the company's ongoing efforts to control quality. Bales of *Bombyx mori* silk arrived, sometimes as Douppion, or double-cocoon filaments, with their "chops" affixed. These were colorful, sometimes hand-painted, tags used as codified labels for both silk quality and provenance, with pictographic names such as: "2 K on the Sun," "Pigeon," "Gold Globe," "Spinning Girl," and "Mt. Yoshino." A chop mark was only as good as its season, however, and the throwster had to keep abreast of this information.<sup>14</sup>

The best silk underwent the throwing process with the fewest problems, and was usually accompanied by instructions, including the amount, type, and put-up of yarn required by the weaving or knitting mill, and special soaking instructions. Sometimes yarn samples were prepared as miniature skeins. Filature names followed the lot of silk throughout the throwing process, and appeared on invoices, correspondence, and bobbin and clearance reports—sometimes with a hand-drawing of the filature's mark.

The number of books was noted, and the "opening weight" of the bale was recorded. A specified number of skeins from precise locations in the bale were sent to a testing laboratory for the certification of conditioned weight; that is, the weight of the silk after "boil-off." Of the two proteins comprising silk, sericin, the stiff coating on the filament (fibroin) was softened, dissolved, and removed during boiling; therefore, determination was needed of the weight of the silk in the absolute dry state, after boil-off. Up to 25% of weight was reduced during degumming, or when the sericin was removed during dyeing and finishing. For each lot, certified, or conditioned weight could be used as a reference through all the phases of textile production. Although only some of the sericin was removed during throwing, soaps, oils, glycerin, pearl ash, and other agents used in the soaking formula and could vary in hydrophilic properties, further increasing the need for testing laboratories.

Relative humidity alone could affect the weight of silk. In an industry where charges were based on a scale reading, unscrupulous manufacturers could profit: accuracy was essential.<sup>15</sup> Frequent notations call attention to a noticeable variance

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13 *National Cyclopedia of American Biography*, vol. 30: 94-95.

14 Chittick, 1913, 26-29.

15 Dale S. Chamberlin, D.I.C., *Chemical Technology of Silk and Rayon Throwing*. (D.S. Chamberlin and Warwick Chemical Co., 1935), 16-17.

between invoice weight and opening weight, sometimes thirty or more pounds in a ten bale lot. Reports included test data, and tracking was initiated for some shipments.<sup>16</sup>

In 1907, W. J. Klots wrote from Scranton headquarters to advise plant managers that each would receive a crate filled with thirty bobbins to be used in sending silk for sizing to the Record & Test department in Scranton. One bobbin was already filled with silk, as a prototype for the correct method of filling. Klots management followed best industry practice in consistently testing silk lots, and selecting reputable importers, whose names frequently appeared in industry sourcebooks for the period.

Production records for twelve months of 1936 list orders for 34 manufacturers of silk goods and include data organized by clients, throwing specifications, the number of machines and personnel employed for each task, and machines left idle. Silk brokers and other firms mentioned tended to be larger and established; manufacturers had large numbers of looms in operation, and more employees. Company names include: French Fabrics, Frank W. Kunze, Bordow, Manhattan, Premier Silk Mills, Rogers & Thompson, Picatinny, American, Rose Silk, Aronsohn, Schwarzenbach-Huber, Frank Ix, and Kansai. Earlier records include M.C. Migel, National Silk, Empire Silk, Jansen & Pretzfeld, Continental, Audiger & Meyer, Brilliant Silk, Mitsui, John Hollbach, Manhattan, and, of course, Villa-Stearns. Other records mention Belding, Angle, National Velvet, Stonecutter, Holmes, and National Mallinson. Many of these companies were dominant producers of broad loom silks, including dress goods and novelties. Neckwear silks, shoe satins, and umbrella crepes are also listed for these firms—along with categories of specific weaves such as georgette, crepe de chine, and “radium.” Some of the mills produced ribbons, or sewing thread. Hosiery and other knitting—including the production of sweaters, underwear, and bathing suits—was the main product for a portion of the mills served.<sup>17</sup>

In 1914, Klots throwing company was described as “about the largest of its line in the world.” 1906 to 1907 Klots mills were all listed as steam powered and Alexandria was electrified; the Lonaconing and Fredericksburg locations still used water power. In 1914 the company projected that its equipment would serve for about fifty years, and that profits from the sale of stock would be used for expansion of floor space and additional machinery. The profitable sale did, in fact, result in the construction of a new wing, and two equipment inventories show machine replacement much ahead of schedule. Klots, in fact, designed much of its own equipment.

In 1900, labor activist Mother Jones turned her attention from striking anthracite miners led by John Mitchell and the United Mine Workers of America to the conditions of young silk workers at the Klots mills in Carbondale and Scranton. Jones believed that improved wages for mineworkers would remove the necessity for their daughters to work, and appealed to the UMWA for assistance. Workers in the silk throwing mills were initially organized under that union and later workers signed with the United Textile Workers of America.<sup>18</sup>

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16 Records of silk received and test reports, Klotz Silk Throwing Co., Production Records, Private Collection, Lonaconing, Maryland.

17 *Official American Textile Directory with which is combined the American Directory of the Knitting Trade, office edition.* (New York: Bragdon, Lord & Nagle Division, McGraw-Hill, 1931).

18 Bonnie Stepenoff, *Their Fathers' Daughters: Silk Workers in Northeastern Pennsylvania, 1880-1960*, 36-38.

For the workers, fair wages and accurate scales for the weighing of piece work were the real issues: Pennsylvania operatives were receiving slightly more than half the wages of silk workers in Paterson. Unrest spread throughout the region's silk industry until walk-outs resulted in the mill owners' threat to quit the coal fields, and testimony to the Industrial Commission that the sole purpose for entering Pennsylvania was to take advantage of child labor. Klots workers accepted a modest gain in a settlement offered by Marcus Frieder, and went back to work.<sup>19</sup> Not surprisingly, by 1914, a Klots stock offering claims that protection against labor troubles was afforded through the segregation of plants.<sup>20</sup>

In 1900, about seventy percent of the silk workers at Carbondale were fourteen to seventeen years of age, ten per cent were twelve and thirteen, and a few were below twelve—the legal age for work in Pennsylvania. Sixty per cent were female. In Lonaconing, Maryland, Klotz Throwing Mill extant employment records from 1907 to 1923—with most dated after 1916—disclose that eighty-one per cent of the workers represented were age fourteen to seventeen at hire, ten workers were thirteen or under, and eighty per cent were female. Only sixteen per cent of this group held work permits that were mandatory at the time. Records in this group numbered 276; full payroll for February, 1920, included 336 employees. In 1905, the year that construction began on the Lonaconing mill, twice as many violations of child labor laws were reported in Pennsylvania industries, and one-third more prosecutions.

By 1908, legislation in New York, New Jersey and Pennsylvania had already established a minimum age of fourteen for child workers; but, for Maryland, Virginia, and West Virginia, the age limit was still twelve. By 1914, Maryland, Pennsylvania, Virginia, and West Virginia—states where Klots' mills were located—still permitted sixteen year-olds to work the night shift, and Virginia did not require proof of age. Records note that Marcus Frieder prohibited night shift work for female employees.

At a time when work in the mines was dangerous and miners' strikes made income irregular, children employed in the silk mills added necessary household income. Many youths were employed by Klots during the summer months only to leave in September when their cards were marked "gone to school." Young males often left to work in the mines, the glass factory, or on the railroad, and young women sometimes left "to get married," to attend nursing or business school, or care for a sick relation. Sometimes they were dismissed for talking too much.

A Pay Roll Rating Sheet for Klots first operating month, April 1907, counts seventy-one mill hands for the month, with 34 winders, 16 tram doublers, 9 tram twisters, and a few each of reelers, lacers, bundlers, and bobbin boys. No night shift had been instituted. The highest pay was afforded the winders' "forelady," paid \$11.00 for 60 hours, whereas other foreladies were paid about \$5.00 for 60 hours. Young female workers frequently "went home" when asked to operate the winders.

The highest-paid hand was the Bundler, at \$4.50 for 60 hours. Weekly production reports prepared in Carbondale headquarters for October, 1909, supports the notion that

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19 Bonnie Stepenoff, *Their Fathers' Daughters: Silk Workers in Northeastern Pennsylvania, 1880-1960*, 50-54.

20 P. S. Dupont Papers, Klots Throwing Company, Correspondence September 1908-January 1915, Preferred Stock Offering, published by Brooks & Company, N.Y., Hagley Museum and Library, Wilmington, Delaware.

this was a new young workforce in training, handling the relatively easy tram production which required little twist and less risk of error. Organzine required more twist, spindle speeds to 12,000 rpms, and more control in doubling. Other records show a piecework system also in place.

Workers reported sick with “sore eyes,” “lung problems,” or “poor health.” One worker injured both legs and was absent for months because mill lights were turned off at lunch time and she had fallen over a hand truck in the dark. A young man had his foot crushed in the freight elevator. Nearly half of this group stayed between one and five years. Series of pharmacy receipts show that management continuously renewed a stock of bandages, mercurochrome, Iodine, oils of clove and peppermint, spirits of ammonia, aspirin, eye lotion, and disinfectant. The Mill housed a small infirmary with a cot and sink, and water cooler outside the door.

Klots Silk Throwing Company documents prove that the success of weaving or knitting, dying and printing was dependent upon the throwster’s art. Production controls were myriad. A recurring nightmare for managers, clients, and workers was the identification of tints. In the soaking phase, silk was tinted with a temporary dye used to separate one lot from another and differentiate twist direction. Records and tint sample cards show that 32 shades were used, and workers often had to make fine distinctions between shades of light yellow and yellow, or light blue and sky blue. In all years, letters from cloth mills complain of streaks in loom goods and yards of fabric lost because tints had been mixed. Klots or General Textile Mills absorbed the loss, and issued stern memos to managers.

One long series of correspondence addresses the problem of dirty yarn. At first managers thought the problem was caused by steam locomotive soot, but microscopic analysis disclosed that spindles revolving for as long as fifty hours straight caused spinning oil to volatilize in a fog and then settle onto the equipment and yarn, where it attracted carbon particles and lint. No correspondence found to this date suggests how this condition may have affected workers’ health. Supplies in a large bin near the machine shop and numerous parts catalogs attest to the attention paid to replacement of flyer wires, thread cleaners, and other items. Marcus Frieder had even introduced air conditioning at an early date. Documents discuss air filtration and the control of humidification to limit moisture regain by the silk, which would quickly respond to changes in relative humidity and cause production problems.

Problems included fuzzy yarn, knots, under-filled bobbins, oil-stained yarn, and delayed shipments. Managers waited for equipment to arrive on time in their mountain town: sometimes it didn’t make it. Workers continually left for higher wages at nearby Celanese Corporation. There were strikes and silk shortages that occasionally caused machines to sit idle. Often, workers demonstrated an extraordinary work ethic and worked for reduced wages and overtime, and many workers also manifested a strong sense of company loyalty.

Much work is yet to be done to fully identify Klots Throwing Company’s contributions to these and successive decades of silk production. Even then, there is a history of Rayon production to explore, when Klots Throwing Company reorganized as General Silk Corporation and again as General Textile Mills, Inc., to supply quality yarn to some of the best companies in American textile history.



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Lonaconing Silk Mill, Lonaconing, Maryland, c 1995

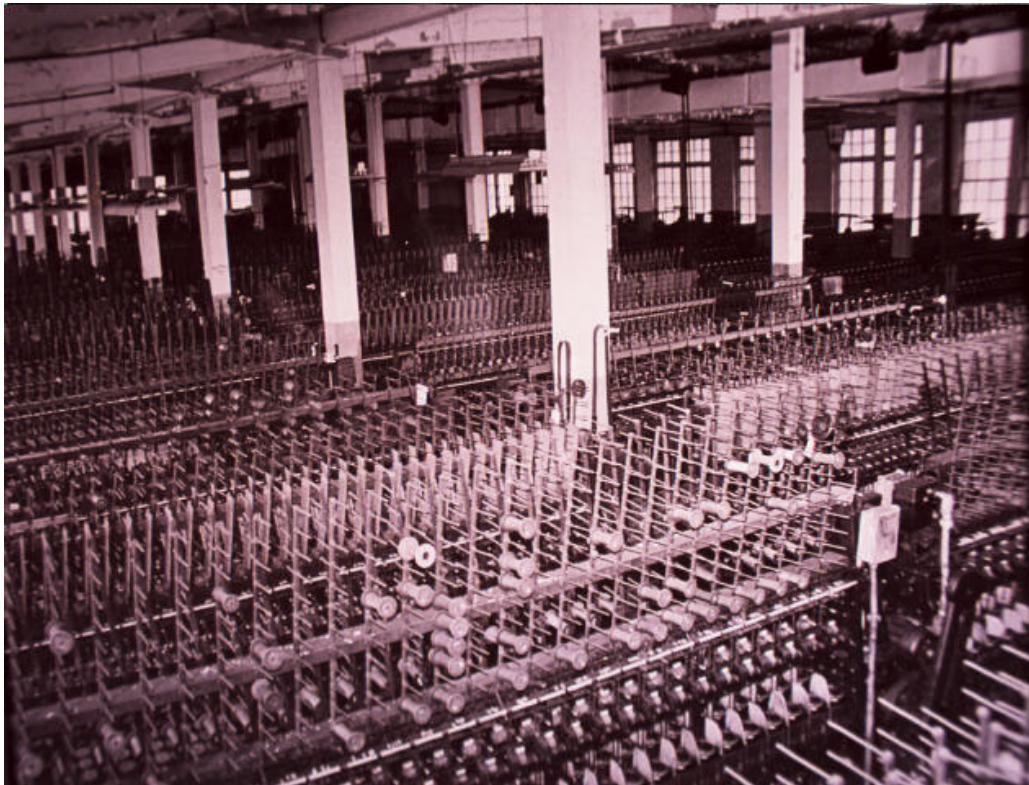
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Filature "Chops," Klotz Silk Throwing Co. & General Textile Mills, Inc., 1907-1957

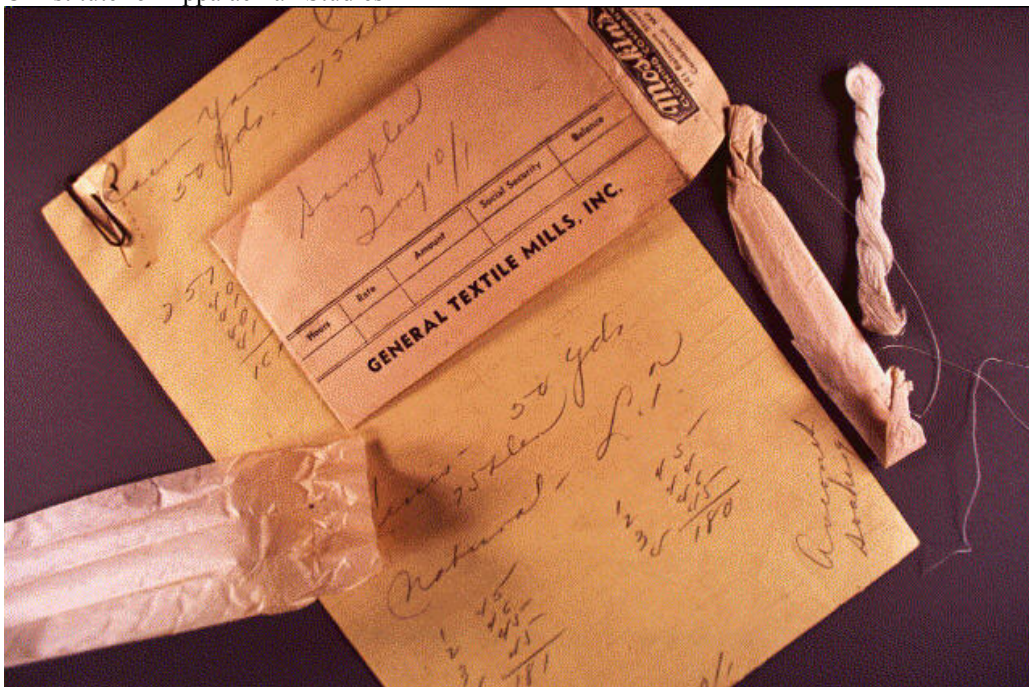
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**Lonaconing Silk Mill interior 1<sup>st</sup> floor. C 1960.**

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**Sample skeins, General Textile Mills, Inc.**

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