

Marjorie Senechal and Stan Sherer, "Northampton Silk Threads" *Historical Journal of Massachusetts* Volume 42, No. 1 (Winter 2014).

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"HOW CORTICELLI SILK IS MADE."
AN ILLUSTRATION OF THE MODE OF PRODUCING SILK.

1. The Moth Laying Eggs—Life Size. 2. Silkworm One Day Old—Life Size. 3. Silkworm Three Days Old—Life Size. 4. Silkworm Seven Days Old—Life Size.
5. Silkworm Spinning a Cocoon—Life Size. 6. Cocoon—Natural Size. 7. Double Lattice Frame for the Worms to Spin upon. 8. Moth emerging from Cocoon. 9. Reeling the Outer Fibre of the Cocoon. 10. Reeling the Inner Fibre. 11. Spinning Silk Thread. 12. Bales of Raw Silk.

THE CENTENNIAL EXHIBITION—THE SILKWORM EXHIBIT IN MACHINERY HALL.
JUDGES' AWARD TO THE
NONOTUCK SILK COMPANY
AT CENTENNIAL EXHIBITION.

For a SPECTACULAR EXHIBIT of a variety of Sewing Silks and Machine Twists of GREAT SUPERIORITY as to STRENGTH and REGULARITY, showing EXTREME CARE in the MANUFACTURE.
Also, for a fine collection of Silk Manufacturing Machinery, embracing Winding, Doubling, Spinning, Reeling and Spool Printing Machines, the latter of very ingenious construction. (Signed) ALFRED T. GOSHORN, Director-General.
JOSEPH R. HAWLEY, President.

Also, Prize Medals received in Boston, New York, Brooklyn, Cincinnati, Santiago, and at Paris, 1878, St. Louis, 1879.

"How Corticelli Silk is Made."

Poster produced about 1910 by the Nonotuck Silk Company showing the many steps of silk-making. However, from its founding in the 1850s until its demise in 1932, all of these steps except the last—dyeing of the thread—were carried out in Japan.

PHOTO ESSAY

Northampton Silk Threads: The Asia Connection

MARJORIE SENECHAL
STAN SHERER



Editor's Introduction: *From the 1830s, when silk manufacture began in New England, to the 1930s, when its by-then behemoth silk thread industry collapsed, Northampton, Massachusetts, was a vital node in silk's worldwide web. But China is where it all began, and all silk roads lead to China today. In 2002 and 2004, photographer Stan Sherer and Smith College professor Marjorie Senechal visited China as guests of Li Long, deputy director of the Zhenjiang Sericulture Research Institute, to observe modern silk farming and silk manufacture first-hand. This photo essay includes Sherer's photographs of silk-making in contemporary China along with selections from Historic Northampton's collection of artifacts and photographs of silk-making at the Nonotuck Silk Company of Northampton. The text, by Senechal, compares and contrasts silk growing (sericulture) and manufacture in contemporary China with sericulture and manufacture in Northampton during its heyday, drawing on materials collected, created, and recreated by the Northampton Silk Project, a "town-gown" local history project Senechal directed from 1998 to 2003.¹*

* * * * *

Two hundred years ago, dreams of silk shimmered in the eyes of every Northamptonite in possession of a barn. “Resolved,” declared the New-England Silk Convention, meeting on September 28, 1842, Emily Dickinson’s father in the chair, “that, inasmuch as in America and China the mulberry tree is found in the native forests, it is a manifest indication of Divine Providence, that this country, as well as China, was designed to be a great silk growing country.”² The Stebbins family had shown it could be done: they raised silkworms, reeled the silk from cocoons, dyed the thread, wove it into cloth, and sewed it into dresses, now in Historic Northampton’s costume collection. But they were the exception, not the rule. By 1846 Northampton’s overplanted orchards lay fallow and the locals returned their barns to other uses. Yet though sericulture failed, silk manufacturing would rise, like a phoenix, from the ashes.

Like the silkworm’s journey from egg to cocoon, the Northampton silk industry passed through distinct growth stages. From 1832 to 1846, silk was the object of utopian visions: first the industrial aspirations of a charismatic and unreliable businessman, Samuel Whitmarsh (1800-75) and then the industrial egalitarianism of a utopian community led by the idealistic and rigidly reliable Samuel Lapham Hill (1806-82). Whitmarsh’s Northampton Silk Company, with its cocoonery, orchard, and factory, was an overnight sensation.

Whitmarsh also fanned mulberry tree speculation that ballooned into New England’s version of the Dutch tulip mania. When the bubble burst, the Northampton Silk Company went under. Silk growing and thread manufacture returned briefly to life a few years later in the hands of the Northampton Association of Education and Industry, founded by Hill and a few others around abolitionist sentiments and Whitmarsh’s defunct business. But the time was wrong, if not the place. In 1846 the Association dissolved, and with it the silk growers’ dream. Northampton’s nascent silk industry tumbled a second time from the cusp of the Industrial Revolution.

Samuel Hill stayed in Northampton, and stayed in the silk business, but manufacturing only. No more silk moths, no more mulberries, no more reeling. Between 1850 and 1880, under his leadership, silk manufacture in Northampton revived. At last the time was right: the newly invented sewing machine promised a vast market for strong silk thread. With imported raw silk and borrowed money, Hill twisted thread for his new enterprise, the Northampton Steam Mills.

In 1852, after many trials and many errors, he brought the first spools of “machine twist” to Isaac M. Singer in New York. Singer tried it and ordered all Hill could make. The jubilant Hill persuaded Northampton to rename

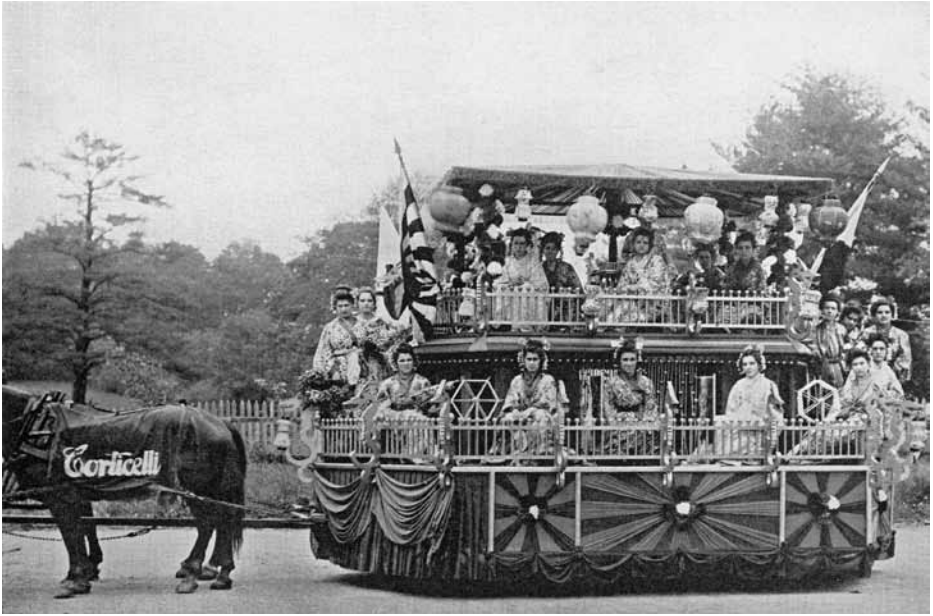
its mill district “Florence,” after the great silk-producing center of Italy. Hill also proposed renaming the Mill River the Arno, but that motion was defeated. The Nonotuck Silk Company was formally organized a few years later. In 1876, the year Hill retired, Nonotuck earned medals for its sewing silk and silk machinery at the Centennial Exposition. By then, it was one of the largest silk thread manufacturers in the nation and one of Northampton’s largest employers.

Between 1880 and 1932, Northampton’s silk industry grew in size and sophistication. Nonotuck added colorful threads for home needlework to its product line, and booklets to teach women how to use them. Working closely with suppliers of raw silk in Japan, the company’s Corticelli brand of thread became world-famous. In New York City in 1910, an electric light sign with a tumbling trademark kitten and rapidly jabbing sewing machine delighted the crowds at 42nd Street and Broadway.

But the wartime expansion and glamorous postwar fashions of the next decade concealed deep problems from public view. In 1922, Nonotuck merged, took its famous Corticelli brand name for the company’s own, and then merged again. At its peak, before the mergers, the Corticelli Silk Company had 935 workers in its three mills, in Florence, Haydenville, and Leeds. The mergers broadened the company’s product line but ceded local control to outside interests. Speedups and wage cuts prompted walkouts and strikes. Labor struggles, changing fashions, the growing popularity of rayon, and the Great Depression tolled the death knell for American silk. The world-famous Belding-Corticelli Company closed its Northampton operations in 1932. Northampton’s role in silk’s worldwide web was forgotten, even locally.³

On our trips to China, I lectured on this sad history at several Chinese universities. To my great surprise, the audience pressed me for answers. “What went wrong,” they asked? “Why did silk fail in America? What are the lessons for us?” Five thousand years of continuous production and twenty-first-century cutting-edge science may not be enough to save the silkworm. The future of silk in China is murky, as ancient virtues give way to speed and modern manufacturing.





Float

In 1904 the Nonotuck Silk Company's float in Northampton's 250th Anniversary Parade celebrated the company's close ties with Japanese sericulture. Courtesy of the Florence History Museum.

Opposite page:

Silk thread dyers, c. 1900

This was the first step performed at the Nonotuck Silk Company. The undyed silk was imported from Japan, where it was raised. From the Nonotuck Silk Company booklet *Silk: Its Origin, Culture, and Manufacture*, published in several editions from 1895 to 1915.

Woman worker winding thread onto spools, c. 1910

From the Nonotuck Silk Company booklet *Silk: Its Origin, Culture, and Manufacture*, published in several editions from 1895 to 1915.

THE MULBERRY

Silkworms—*Bombyx mori*—eat one thing and one thing only: fresh, finely chopped leaves of the mulberry tree. They store the digested mulberry liquid in their silk glands until they nearly burst. Then they eject it in two fine streams that join together on contact with the air and wind themselves into cocoons. By that time, they’ve grown from the size of a sesame seed to the length of your forefinger, all in a few short weeks. They eat like horses; you need an orchard to feed just a few. Sericulture manuals of the 1830s instructed American farmers on which mulberry varieties produce the best silk (the white-fruited *Morus alba*, not the native purple), how to plant and care for the trees, and how to strip their leaves. All this was unnecessary, proclaimed Northampton’s earliest silk messiah, Samuel Whitmarsh. One could forget the chopping and other picky “details not at all applicable to what I shall term the American System.”²⁴

The Chinese knew better then and they know better now. They still chop the leaves, finely for the newly hatched worms, coarser for the larger ones. And they still debate mulberry varieties, not two, but some two hundred.



A caretaker's home in the “Mulberry to Green” project, Langzhong region of China, 2002. Photograph and all following were taken by Stan Sherer.



A sericulture worker chops mulberry leaves for the worms.



Worker carrying mulberry leaves to the silk-worm rearing houses. Note that all of the images show older workers. Young people rarely work in silk anymore. Most have left for urban employment.



A sericulture worker covers the young worms and their mulberry leaf meal with an inflated cocoon.



Woman pausing outside a silk worm-rearing hut.

We visited sites of a demonstration project, “Mulberry to Green,” in the Langzhong region of China. Here “mulberry” means the whole tree: leaves, fruit, and wood. It’s a tricky balance: there’s a trade-off between leaf size and fruit size, and between leaf quality and fruit quality. A billboard on the highway promotes mulberry wine. Our hosts gave us a case of their new invention, mulberry vinegar. If you drink it with wine, they assured us, you don’t get drunk.

THE CARE AND FEEDING OF SILKWORMS

Excerpts from an ancient Chinese silk manual:

The silk worms do not like to eat damp leaves;

They do not like to eat warm leaves;

The newly hatched worms do not like the smell of fish, fried in a pan

They do not like to have a window, exposed to the wind, to be opened;

They do not like to receive the rays of the setting sun;

They do not like, when the temperature of their habitation is warm, to have a sudden cold or violent wind introduced there;

When their habitation is cool, they do not like a sudden change to excessive heat . . .

Nonsense! claimed New England's silk enthusiasts. Yet their worms died, because nonsense it is not. A quarter century later, in 1869, Louis Pasteur proved rigorously that fermenting leaves kill silkworms; indeed, all the ancient rules and regulations make sense by modern scientific standards.

In the future—perhaps—genetically engineered silkworms will deign to eat synthetic mulberry paste and produce silk as strong as a spider's. Meanwhile, sericulture remains labor-intensive and demanding. In the Langzhong region, I noticed a woman sprinkling freshly chopped mulberry leaves on large trays of silkworms and then spraying them. I asked our host, Li Long, why she was doing that; I had never seen this spraying step before. Long rushed over and told her to stop. "That's okay for newly hatched worms," he reminded the worker, "but at this stage—three weeks—you must soak the leaves in a lime solution first, then chop the leaves and feed them dry."

FROM COCOON TO THREAD

In October 1843, silk growers from many states, including a delegation from Northampton, assembled at the American Institute in New York City for a two-day convention. Silk would succeed in America, one leading silk grower declared to loud cheers, because "our soil is virgin, our sky is blue, and our people are Protestant!"⁵ However, the next speaker reminded the audience that American raw silk was still poorly reeled. Indeed, reeling—unwinding up to twenty cocoons together into a single sturdy, untwisted strand—was the hard rock on which American sericulture forever floundered. (Even Samuel Whitmarsh acknowledged the need for skill in this department.) Chinese, French, and Italian girls learned to reel by observing at their mothers' knees and through long apprenticeships in their teens; untutored Americans grasped the thread with one hand and clutched a manual in the other.⁶

Today, as you see in these images, reeling is almost entirely automated. An assistant feeds the cocoon supply into and through the hot-water conveyor, but it is the machine, not her scalded hands, that gently unwinds the softened silk. The strands are then wound on reels to be twisted into thread.

According to legend, the Chinese learned to reel five thousand years ago. The Empress first discovered it. Sitting under a mulberry tree one day, she heard a plop! A cocoon had tumbled into her cup of hot tea. Instead of screaming, she looked closely: why, the thing was unraveling! She tugged and tugged. When it petered out, she had a mile of unwound fiber in her hand. Today she is revered as the Silk Goddess and also for domesticating the cat. In her "Cat-Mouse Temple" we saw fresh flowers and skeins on her altars, brought by peasants in hopes of her assistance. But market forces may prove greater than her own.



Silkworms transferred to beds of twigs and netting, where they will spin.



Silkworms ready to spin their cocoons.



Selecting cocoons for reeling.

Opposite page:

Modern automated reeling still requires some human labor. Assistants feed the cocoon supply into and through the hot-water conveyor. Hot water softens the cocoons and helps loosen the silk strands.





Winding reeled silk.

FROM THREAD TO CLOTH

At Zhenjiang University, a professor and a dean worried aloud about China's weakness in the high-end silk market. The Italians do better. Why? One theory was that it was due to poor Chinese design while another attributed it to dyes. Italian dyes don't wash out; Chinese dyes do. The Italians know some secret, he said.

'Twas ever thus. In America in the nineteenth century, savvy customers eschewed American-made silk thread, prompting even savvy American silk thread manufacturers to invent Italianate brand names for their products. A street in Florence still bears the deceptive name the Nonotuck Silk Company gave its silk sewing, crotcheting, and knitting threads: Corticelli.

Today, in the exhibition showroom of the Shu Brocade Company in Chengdu, you can watch elderly master weavers and drawmen weave intricate patterns on ancient drawlooms. The drawmen sit on perches high above and draw the cords that lift the warp threads. The weavers, in front, throw the shuttles between raised and not-raised threads and beat in the weft. You've stepped back in time, a thousand years or two, but only at the Shu. In other Chinese silk factories, weaving, like reeling, is automated, and the patterns are printed. The classic Chinese dresses with long, straight, slit skirts and thong-fastened jackets are made mainly for tourists; chic Chinese prefer stylish silks, chiffons in new textured weaves.

Zhenjiang University students bombarded me with questions, in excellent English. Did sericulture fail in America because they used wild instead of cultivated mulberry trees? What are the problems in the American silk market now—what can we do to get people to buy ours? Do Americans like to wear polyester? What do I think of U. S. textile trade policies?

HJM





Folding sheets of silk for transport to the dye room.

Opposite page:

Drawman working a loom at the Shu Brocade Company, Chengdu. The drawmen and weavers work in perfect unison, quietly, steadily and rhythmically. They've worked as teams for decades; they and their craft will soon die out.



The final product: printed cloth.

Opposite page:

Although at first glance this image looks like a single photograph, it is really three photographs superimposed to create a collage. Stan Sherer.





WHEN THE HORSE arrives in the spring night sky, the mulberry trees stir to life. It's the time to bring silkworm eggs in from the cold and tuck them in sachets under your gown so the worms will hatch when the first leaflets uncurl. Each day for a month you trudge from grove to nursery with leaf-brimming baskets. You feed the worms day and night, guard them from dangers, the boisterous laugh, the acrid smell, the eastern wind, the western sun, until they wrap themselves in cocoons. What the silkworm spins, you can unwind, the Silk Goddess taught five long millennia ago. Even in the twenty first century Chinese silk farmers lay flowers on her altars every spring, silk skeins in the fall on the day of her death. From her genius flowed the glistening satins and shimmering damasks that gave the Silk Road its name. The mountain is shrouded in mist and the road is washed out. We can't go there, not even on foot. From a bridge far below we strain for fleeting glimpses of the white stone arch of her tomb. At last we see it! – now we don't. As befits a living legend.

Text by
 Marjorie
 Senechal.

Editor's afterword: Traditional sericulture remains in crisis. As Marketing Director Antero Hyvärinen explained in the *International Trade Forum Magazine*:

Formerly a luxury trade, the silk industry is at a crossroads. New sandwashed silk brought a wider range of affordable silk products within the reach of millions of consumers during the 1990s. Competition from high-tech synthetics has eaten away market share. Raw silk prices have plummeted by half, to the point that they threaten the sustainability of this industry.

Traditional producers are cutting back on labour-intensive silk production, as urban industries lure farmers from a business in which incomes dropped radically in recent years. Meanwhile, millions of livelihoods are at stake, especially in rural areas, for this traditional and environmentally sustainable product....

Millions of families in rural areas in China as well as in Thailand, Brazil and other countries may now face the socioeconomic choice of whether or not to continue producing silk. If farmers turn from this activity for a more lucrative type of farming, the industry cannot easily recover. Working with silkworms requires strict discipline, learned by tradition through generations.⁷

Notes

1. The Northampton photographs were selected from the archives of local history museums by participants in the Northampton Silk Project, a local history project that brought Northampton's forgotten century of silk back to life. The project raised silkworms, replicated and used nineteenth-century silk twisting machinery, and mounted exhibitions, including several at the Historic Northampton Museum and Education Center.

2. *First Annual Report of the New-England Silk Convention at its session, held at Northampton, September 28, 1842*, Northampton: printed at the Gazette Office, 1843.

3. The previous four paragraphs are adapted from *American Silk, 1830-1930* pp. 6-7. For more see *Northampton's Century of Silk* and also Charles Sheffield, *The History of Florence, Massachusetts, including a Complete Account of the Northampton Association of Education and Industry*, Florence, Massachusetts: by the Editor, 1895. Reprinted by the Book Committee of the Florence Civic and Business Association. See also Marjorie Senechal, "The Invention of Machine Twist: The Nonotuck Silk Company from Moths to Millions," (originally presented at the Textile Society of America convention, 2002) available at <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1544&context=tsaconf>

4. Samuel Whitmarsh, *Eight years [sic] experience and observation in the culture of the mulberry tree, and in the care of the silk worm: with remarks adapted to the American system of producing raw silk for exportation*. Northampton, 1839.

5. "The Silk Question Settled: Report of the Proceedings of the National Convention of Silk Growers and Silk Manufacturers ... held in New York, Oct. 13th and 14th, 1843." (Boston: T.R. Marvin, 1844). Silk manufacture was not limited to Northampton. By 1874, neighboring Holyoke had four silk mills. William Skinner & Sons was often referred to as the "largest silk mill in the world." The factory complex, which took up several industrial blocks, employed 3,000 at its height in the early 1920s, a figure which dropped to 800 by the early years of the Great Depression. However, Skinner's was unusually large for a silk mill, most of which were far smaller than cotton or woolen mills. Holyoke had three other silk mills. In 1934 they employed 176 workers combined, compared to Skinner's 800 workers: Mabson Silk (80), Jennings Silk (80), and Clinton Silk (16). See L. Mara Dodge, "Anna B. Sullivan: The Formative Years of a Textile Union Organizer," *Historical Journal of Massachusetts* 35 (Summer 2008): 184-225; Sarah S. Kilborne, *American Phoenix: The Remarkable Story of William Skinner, A Man Who Turned Disaster Into Destiny*, (NY: Free Press, 2012); and Kate Navarra Thibodeau, *Holyoke: The Skinner Family and Wistariahurst* (Mount Pleasant, SC: Arcadia Publishing, 2006).

6. Antero Hyvärinen, "Silk: A Tradition with a Future?" *International Trade Forum Magazine: The Quarterly Magazine of the International Trade Centre*, Issue 1/1999. <http://www.tradeforum.org/tradeforumhome/> See also Edward Wong, "Silk Craft Fades in Village That Clothed Emperors," *New York Times*, Oct. 11, 2010.



Original caption reads: The “Old Oil Mill” at Florence, Mass., Occupied in 1854 by the New York & Northampton Silk Company. Note: This was a linseed oil mill on the Mill River, later Northampton’s first silk mill. Source: L.P. Brockett, *The Silk Industry in America* (NY: George F. Nesbitt & Co. Printers, 1876), p. 54.