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Sericulture, Silk and South Union Shakers

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by

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Dear Friend, most a year has elapsed I'm apprized,
Since a present most beautiful greeted my Eyes:
'Twas borne to me safe, by kind Motherly hands
From Dear Gospel Kindred, in far Western Lands.

O! those pretty Silk Handkerchiefs! beautiful Gift!
They bro't love to my spirit, thus gave it a lift:
For 'tis joy without bound in thy memory to dwell
Friends, dearest of Friends I love you full well.

Sarah Bates (1869)

The joy of this delightful poem swells from remembrances of a sweet friendship and from the prized gift, silk kerchiefs from the Sisters of South Union, Kentucky.[1] The Kentucky Shakers produced a variety of textiles, but few overshadowed the mystique of their spectacular iridescent silk, treasured for its light weight, easy maintenance, longevity, hygroscopicity and luster. Anyone familiar with silk production appreciated the tremendous amount of time, effort, and skill involved in its manufacture.

Several Shaker communities produced silk, but Kentucky Shakers were particularly adept at the process. Kentucky's temperate climate was conducive to mulberry tree cultivation and sericulture, the raising of silkworms. South Union Sisters used silk in the manufacture of kerchiefs, neckwear, hat bands, bonnets, and sewing silk. Occasionally entire garments such as dresses were made from the luxurious silk.

Documentary evidence indicates that silk was sometimes produced for supplementary income. As early as 1853, the Mount Lebanon Ministry "requested to know . . . if we [South Union Sisters] could furnish some handkerchiefs for the Groveland Sisters, & at what price."[2] An 1859 journal entry noted: "Silk business — has been carried on by the Sisterhood for some time, with tolerable success — they have just taken from the loom a web of 100 yards making 164 fine white pocket kerchiefs for sale

— @ $12 pr. dozen."[3] While visiting the South Union community in the 1850s, David Parker bought a "number of them [kerchiefs] for the sisters at Canterbury."[4] An 1875 journal entry also mentions a large amount of silk--46 yards--being taken off the loom for sale.[5] Apparently the kerchiefs were also marketed locally; an 1881 diary entry revealed that Amber Bass of Auburn, a community three miles west of South Union, "came up to the Office to buy a silk handkerchief. He took 2 on trial."[6]

Letters from various Shaker communities indicate that the South Union Sisters often made gifts of their silk products. One Sister from the North wrote: "Be assured dear Friends that I have not forgotten your special notice of love [kerchief] to me...[I] express my grateful feelings to you also to all, who have ever worked on the silk."[7] Another Sister wrote: "We have felt a real burden about your giving away so many of your silk Neck Kerchiefs and here we are receiving another."[8] The Shakers had a long tradition of exchanging small gifts, and a Kentucky kerchief was a prized gift indeed.[9]

Tradition reveals sericulture began around 2700 BC in China where the secrets of silk production were jealously guarded. The Emperor Justinian is credited with introducing the culture to Constantinople in 555 AD. Silk production gradually moved from southern to northern Europe from the ninth to the sixteenth centuries. Initiated in Virginia as early as 1619, several colonies of the pre-revolutionary decades offered bounties to encourage sericulture but to no avail. The introduction of Morus multicaulis, a new type of mulberry tree, which produced large leaves, prompted Americans in the early nineteenth-century to invest in sericulture. Always ready to undertake a promising enterprise, the South Union Shakers began producing silk in the 1820s.

The earliest mention of sericulture at South Union occurred in 1828 when two Sisters from Enfield inquired about silk production at the western Kentucky community:

> We want to ask one little question, how has Sister Prudence [Houston] prospered with her silk worms as we feel quite interested in this branch, and think it is profitable employment, and should be glad to do more in this way if it was in our power, we have had two crops this summer, but did not do quite so well as usual the

> season being rainy. Sister Rhoda is now spinning silk to make up our clothes for winter.[10]

It is possible that Prudence Houston had been involved in raising silkworms for several years, but it was not mentioned in the community's journal which carefully documented the Shakers' activities.

In 1832, the community journal's first entry concerning silk read: "The Sisters all appeared dressed in their home Made Silk Kerchiefs the first time at So. Union."[11] The next year the "good Sisters" presented each of the Brethren "a beautiful Silk neck kerchief — made from the cocoon by their own hands." The community's record keeper adds: "Who ever reads this Journal will be bound to own that the Brethren were blest with as good & industrious & Kind Sisters as can be any where found — We . . . hope we shall all remember their goodness when this present is worn out."[12] At South Union, the Sisterhood dominated the silk industry, although children often helped pick mulberry leaves in late spring and early summer. The popular press promoted sericulture as particularly suited for women. One farm journal noted: "It is especially woman's work. It is not degrading. It is neat and extremely interesting."[13]

Cultivation of a mulberry orchard was the first step in preparing for sericulture. The white mulberry (Morus Alba)was the premium mulberry for silkworms as it "produced fine quality silk." Although several varieties of mulberry trees were planted at South Union, the Sisters occasionally relied on the leaves of indigenous Osage orange trees. One Sister surmised these leaves "as good for them as the white mulberry."[14] Mulberry trees were generally propagated from cuttings in early spring "or about the time of planting corn." Cuttings were placed in rows four feet apart with twelve inches separating each row. Trees were planted in light sandy or gravelly soil, but "almost any soil . . . that will mature Indian corn is suitable for the mulberry," declared one experienced farmer.[15] Two hundred trees were planted per acre. Leaves could be gathered in the first season, but growers advised "at least three should be left" on each

tree, and cuttings could be made after the second season of growth. In three years each tree could yield ten or twelve pounds of leaves.[16]

After planting the mulberry trees, the erection and outfitting of a silk house, or cocoonery, was necessary. It was advised that the house be constructed on elevated ground and convenient to the mulberry orchards. The most important elements of a good silk house included adequate ventilation and cleanliness. Windows, situated on all the building's sides, provided proper ventilation. In the northern United States silk houses were often two stories above the ground with a heating furnace in the cellar. Because silkworms were raised only in the warmer months at South Union, fireplaces or warming devices were not necessary in their silk houses. A community's commitment to sericulture determined the size and number of silk houses.

One silk house at South Union still stands, but the location of the mulberry orchards is indeterminable due to extensive cultivation. However, the community's journals indicate that the East and the Center families maintained mulberry orchards near their hen lots. Except for the extant silk house, no evidence was preserved that indicates the location, size, or number of silk houses at South Union. The only clue is in a letter written by Eli McLean to the "Respected Ministry": "Engineers have located the road through our place they run close to the ox stables at the cross roads on the North side of it through the garden back of the office between the water cistern & the old silk houses angling across the road." [17]

Silkworms were grown on shelves known as hurdles (Figure 1), which were intermittently stacked on an open framework. A hurdle consisted of a frame about five feet long and two feet wide of thin boards re-enforced with two braces. Tacks were driven around the inner edge of the frame about three-quarters of an inch apart. Tow twine around the tacks created a mesh. After the mesh was dampened and dried taut, it was shellacked. A similar hurdle was covered with strong cotton or tow cloth which was secured with small tacks.

This hurdle rested below the mesh one to collect the litter produced by the worms; it could be easily removed and cleaned. Keeping the silk house sanitary was extremely important to the health of the worms.

Once the orchard and silk house were prepared, eggs were procured. Although it is unclear how the South Union Sisters obtained their eggs in the early years, they later ordered them from Louisiana and Pleasant Hill.[18]

It was recommended that the eggs be "from a climate similar to that where they are to be hatched." This explains why South Union acquired eggs from Pleasant Hill. Good eggs were said to "crack under your nail; while the bad ones will make no noise when pressed in the same manner."[19]

In 1882, when the Sisters received eggs too early to begin hatching, they went to "Auburn to deposit the silk worm eggs in an ice house . . . for safe keeping." The cool temperature kept the eggs from hatching.

A little over a month later the Sisters retrieved the eggs and within a week the "silkworms commenced hatching."[20]

"When the first buds of the mulberry come out" was the preferred time to begin hatching silkworm eggs or "silk seed."[21] One ounce of silk seed contained about 42,000 eggs. Placed in "a warm situation" of approximately eighty-five degrees Fahrenheit, the eggs hatched in five or six days. It was highly desirable for all the worms to hatch within a forty-eight hour period, due to the worms' predictable growth cycles (Figure 2). Eggs that did not hatch within a two day period were destroyed.

Most growers placed the eggs in small flat boxes that were kept near a stove. However, any source of heat, including the human body, could produce a "warm situation," One writer recalled hatching eggs in 1803 by putting "a few eggs of the silkworm in a flat snuff box, under the pit of my arm. Early in the morning of the 3d [third day] they were hatched."[22] Another writer of the period noted that some growers hatched eggs in little bags that were carried "under their clothes in the day-time, and

under their pillows while sleeping." Eggs changed color during gestation from gridelin (reddish purple), to purple to an "ash-colored hue." Upon turning white the eggs were exposed to the open air at least twice a day in order to "give the embryos sufficient air."[23]

Shortly after hatching, growers moved the healthy worms, one-twelfth of an inch long and "of a black color," to the hurdles. This was done by spreading finely chopped mulberry leaves on a piece of heavy paper or parchment and waiting for the worms to attach themselves to the leaves which were then carried to the hurdles.[24] An even temperature was necessary for at least the first twelve days, as silkworms are extremely sensitive to temperature changes. If rooms were heated with fires, it was vitally important that they be well ventilated as the worms were also sensitive to smoke and any offensive odors. Worms were fed two or three times a day with tender cut leaves until the first molting.

Within five days most worms could eat whole leaves. Leaves must be dry. If they could not be picked daily, one writer recommended storing them "in a cool dry room, and stirred now and then, to prevent their heating and wilting."[25] One sericulturist noted: "If brown or seared leaves are given silk worms, they will only eat that portion most agreeable. I . . . find their instinctive aversion for improper food surpasses man, with all his wisdom."[26] Rain or shine, worms had to be fed. Caught without a reserve of leaves one South Union Sister mentioned a rainy day harvest: "Raining severely, nevertheless we had obliged to gather leaves for the silkworms."[27] Despite its tedious nature, writers glamorized the leaf gathering. "The gathering of the leaves and feeding the worms," one author penned "give light and wholesome exercise, enlivened by the anticipation of a rich reward . . . [an] ample compensation for the food they have received."[28]

Feeding time was a busy season for the Sisters and other members were often called upon to help. In 1866 a Sister recorded: "Some of the sisters are sewing but the most of the family are working with silkworms."[29] In 1882 one Shaker noted that the Sisters were

"much engrossed with feeding and caring for the silk worms."[30] With so much attention lavished upon the silkworms, they sometimes endeared themselves to the Sisters. When Elder Henry Blinn of Cantebury visited Pleasant Hill in 1873, he observed the attention paid to the silkworms: "The sister who had charge of them would pick them up & call them 'pretty little creatures.'"[31]

During its lifetime a silkworm molts or shed its skin four times. The first molt occurs after the fifth day when the worms appear "dull and weak, they lose their appetite, the skin becomes bright, and they seek for a place to lie by themselves." This period of "sleep" generally lasts about twenty-four to twenty-six hours. During this time the skin of the worm cracks. When the creature awakes it sheds the old skin. The Sisters often noted the molting periods, and no doubt were amazed by the regularity of the process. The other three molts take place at approximately seven to nine day intervals. After each molt some worms were removed to other hurdles to allow room for growth. Worms that did not complete the molting process were discarded; more worms perished after the third molting than at any other time.[32]

When worms were ready to spin silk, they presented "something of a yellowish appearance; they refuse to eat and wander about in pursuit of a hiding place, and throw out fibres of silk upon the leaves."[33] At this time the hurdles were cleaned and straw, preferably rye straw, was placed upright in bunches on the shelves for the worms to attach their cocoons. A worm's silk glands consist of two long sacs running along the sides of the body, which open by a common orifice called the spinneret. When ready to spin these vessels become filled with a "clear viscous fluid" which becomes silk when exposed to air. The worms wind themselves into a hollow ball which, when finished, in "about the size and shape of a robbin's eggs."[34]

Workers reserved a portion of the cocoon crop for seed. Nicholson recommended selecting "equal numbers of males and females, of the yellow kind" because they gave "the most & best silk." The sharply pointed cocoon of the male differed from the

female's cocoon which was round on each end.[35] One manual directed the silk worker to shake the cocoon close to the ear to "ascertain whether the chrysalis be alive." If alive and "loosened from the cocoon" it produced a "sharp sound."[36] The Sisters next collected the tow, or floss, of the cocoons' outer coat. With the cocoons threaded on a string, the butterflies emerged and mated. Placed upon a piece of cloth, the females laid their eggs, which were stored in a dry place, secure from extreme temperatures, mice, and insects until time for the eggs to hatch.[37]

Attendants killed, or stifled, the chrysalis inside those cocoons reserved for silk. If not destroyed, the chrysalis would break the prized long fibers as it ate through its cocoon, emerging as a moth. One silk expert recommended stifling the cocoons in ovens "heated nearly warm enough to bake bread" until they made a "ratling noise." When the noise diminished, attendants were to wrap cocoons in a blanket to suffocate those still alive. Silk workers sorted cocoons according to quality. The firmest cocoons--those that were compactly spun--contained the best silk.[38]

Reeling, the next step, consisted of first softening the gummy matter that held the cocoon together and then unwinding the long filaments. The reeler first threw a number of cocoons into a vat of hot water. After holding the cocoons under water for several minutes, she would quickly stir them with a small broom, or whisk, until fibers from each cocoon stuck to the broom. When the filaments came off the cocoons freely, the reeler wound them onto a silk reel. As one fiber was not very strong, from three to twenty-five strands were reeled together, depending upon the thread's intended use. The cocoons' natural gum joined the strands. When a filament began to run thin, the reeler would retrieve another from a new cocoon and attach it to the larger strand. The fibers unwound in a figure eight pattern first from one side of the cocoon and then from the other. Passing through special guides that cleaned the thread and kept it even, the silk was wound upon the reel (Figure 3).[39]

Reeling was a tedious business requiring "much skill, tact, experience, patience and watchfulness." One person attended the cocoons while another propelled the reel. Experienced silk worker Melissa Minter had "charge of the silk from the cocoons" at South Union in June of 1866. Experts agreed that "the *quality* of the silk depends much upon the art and skillful management of the reeler." Practice, patience, and good judgment were required "to render one perfect in the art of reeling."[40]

When the worker had reeled a determined amount of thread, now called raw silk, she carefully removed the skein from the reel, placed it in a cotton bag, and submerged it for several hours in water one hundred degrees Fahrenheit This step softened the gum and prepared the silk for the next step -- throwing.

Throwing was the process by which the throwster twisted the strands of raw silk together to form a larger thread. The final product determined the numbers of threads that were twisted together. For example, sewing silk which required more tensile strength needed about twenty-five strands of silk, but silk used in making fabric required fewer.[41]

Workers carded and spun the floss and waste silk saved from the broken and deformed cocoons. On 24 February 1864 South Union's Eldress Nancy Moore recorded going "to the factory to see the Sisters who were spinning silk, . . . [they were] getting along nicely." In 1835, the industrious South Union Sisters "made 10 changeable ones [kerchiefs] out of the floss silk, thus saving all the cocoons."[42]

Experts differed on the stage at which the silk should be washed of its natural gum. One asserted that the raw silk only be washed after the threads were "twisted, or woven; otherwise, the component parts will get asunder, and be entangled." At whatever stage, silk needed a thorough cleansing to appear white and lustrous.[43]

The South Union Shakers had perfected the art of dyeing cloth by 1814. In 1820, the Sisters began to dye silk for the world's people. Presumably, customers brought their silk

fabric and clothes to the community as no record exists of South Union growing silk this early.

Extant Shaker kerchiefs in the collections of Shakertown at South Union and The Kentucky Museum at Western Kentucky University reveal the color combinations the Shakers produced. Rose, lavender, purple, and white examples make up the bulk of these collections, but items of a green, a mustard, and a brown plaid also exist. In 1869, Sarah Bates of Mount Lebanon, New York, wrote to Eldress Nancy that she was "fitted out for nice silk Handkerchiefs, of many qualities and many colors. One White, three mixed colors Red blue &c and mostly by your hard labors, at Pleasant Hill and South Union."

Many times Shaker Sisters wove handkerchiefs so they had a "changeable," or iridescent quality. They achieved the illusion by using one color for the warp thread and another color for the filling.

The items would appear a different color depending upon the angle from which it was viewed. An 1866 diary entry reveals that four South Union Sisters were "coloring silk Blue to fill on red." One striking South Union example is a dark purple kerchief made of blue and red threads. The kerchief, with its border of red and green stripes, illustrates the unusual color combinations selected by the Shakers.[44]

After dyeing, Sisters wound the threads onto individual spools and set them into a rack. The warp threads, those placed upon the loom, could then be unwound from the spool rack and measured simultaneously. In 1871, Sister Lucy Shannon noted that the Sisters "commenced spooling a web of silk." The women taught each other the special skills of textile producing. In 1864, the "rest of the Lot [Sisters] went to the North family to . . . shew Lavina Jones how to warp a tow silk web."[45]

Shaker records first mentioned specialized equipment for weaving silk in 1836. The South Union journalist noted: "Saml McClelland has got his new Silk Loom into operation, it works handsomely." Records do not indicate the design of the loom. In 1853, Sisters wove silk handkerchiefs on a "common shuttle loom." The Sisters felt that

the "tedious process," which also involved spinning the silk "entirely by hand," justified the "middling high" cost of the product.[46]

Mount Lebanon's Sister Sarah Bates apparently appreciated the Sister's abilities. In 1869, thanking South Union members for their gift of a kerchief, she wrote:

> I never can dress myself with these Beauties without thinking of the Dear souls who have almost spilt their hearts blood and worked the flesh off their bones: And strained their nerves and Eyes to the utmost to prepare those choice articles. Why! . . . I am struck with astonishment, that your fingers can work such miracles: and keep soul and body together: And if I am ever able to pay the price that Justice would require, it must be hereafter. It may be that I have laid up treasures in Heaven, that I can draw interest from. — And measurably reward you yet.[47]

It is difficult to translate quantities of reeled silk into yards of fabric. In 1832, South Union Sisters produced "11 1/2 [pounds] reeled silk [and] 5 1/2 of floss" from 110,285 cocoons. Twelve pounds of cocoons produced one pound of reeled silk. These ratios corresponded with those in an 1838 article in the *Silk Grower*, a magazine advocating the silk industry.

The article also stated that one pound of reeled silk would produce 14 yards of the finest gros de Naples, a type of ribbed silk fabric. Using these figures as a rough guide, the Sisters' 1832 crop was adequate to produce the silk neck kerchiefs given to each of the Brethren on New Year's day of 1833.[48]

Silk, referred to as "the prettiest and the fairest of all the threads", and its manufacture required a level of skill and patience American colonists seemed to lack. Brockett noted that "native grown" silks, due to "bad reeling, imperfect twisting, . . . insufficient cleaning, & ignorance in regards to weaving & finishing the Goods . . . were fuzzy as well as stiff; the colors did not stand well, and they were defective in lustre." [49]

The Kentucky Shakers were known for the fine quality of their silk goods. The Silk Grower recognized the Kentucky Shakers as "those industrious people . . . whose steady, persevering labors and intelligence are the surest guarantees of success [in silk

cultivation]."[50] New Hampshire Sister Mary Whitcher, in an 1873 letter to Eldress Betsy and Eldress Nancy of South Union, wrote:

> A Kentucky silk kerchief — White as whiteness — rich as richness — How can I keep it? Have the dear Ministry given away the last one of theirs? — We have worn it — We have shown it. — Brother James thought it looked like Ky. manufacture, not knowing what he had brought us . . . Oh! dear Sisters, you are once more hand in hand, as well as heart in heart.[51]

Made of plain or twilled weaves, Shaker kerchiefs showed exceptional craftsmanship. Sisters wove the striped borders by alternating the weave structure of the fabric or by inserting a different color of thread (Figure 4). An examination of the hem reveals the neat, even, and almost invisible stitches of extremely fine handwork. Sometimes the maker stitched her initials in the corner of the kerchief. While examining her gift from South Union, Mary Whitcher exclaimed "Ah! we see [the kerchief] marked with a little N — this mean Eldress Nancy ."[52] The Brethren were not forgotten. Beginning with their first gift of neck kerchiefs in 1832, the South Union Sisters used their hard-earned silk to supplement the Brethren's wardrobe. Of a later vintage, a rose-colored silk stock at South Union displays the inscription "Wm. Booker" on its lining (Figure 5).[53]

Many years after sericulture ended at South Union -- likely in the mid-1880s -- the tradition of giving silk kerchiefs to valued friends continued. On Christmas Eve 1915, John W. Perryman, one of the oldest Shakers at South Union, sent a package to a friend with the following note: "I received your Christmas card. I am sending you a silk handkerchief made by the Shakers. Silk was raised, spun and wove, [and] collored here. I am sending Mr. Bailey a neck-tie which I trust he will be pleased with."[54] Did this recipient understand the true value of this small gift? Many voices from Shaker history could attest to the prized treasure of a simple silk kerchief from the hands of the South Union Sisters.

Notes

[1]Sarah Bates (Mount Lebanon) to Eldress Nancy E. Moore (South Union), 15 August 1869, Shaker Manuscripts, Western Reserve Historical Society Library, Cleveland, Ohio, IV-B-20, microfilm, hereinafter cited as WR.

[2]Ministry (South Union) to Ministry (Mt. Lebanon), 16 October 1853, IV-A-62 (WR).

[3][South Union Shaker] Record B, 1836-1864, 1 January 1859, Manuscripts Collection, Shakertown at South Union, South Union, hereinafter cited as SU.

[4]Beverly Gordon, *Shaker Textile Arts* (Hanover, N.H.: University Press of New England, 1980), 170.

[5][South Union Shaker] Journal, 1872-1878, 18 November 1875, Manuscripts Collection, Library Special Collections, Western Kentucky University, Bowling Green, Kentucky, hereinafter cited as WKU.

[6][South Union Shaker] Journal, 1881-1883, 22 November 1881, V-B-229 (WR).

[7]Mary Whitcher (New Hampshire) to Eldress Betsy and Eldress Nancy (South Union), 31 October 1873, IV-B-21 (WR).

[8]Mary Whitcher and Sarah Woods (New Hampshire) to Sisters (South Union), 23 January 1874. IV-B-21 (WR).

[9]Julia Neal and Elmer R. Pearson, *The Shaker Image* (New York: New York Graphic Society, 1974), 48-9.

[10]Ruth Farrington and [Meitty] Munsell (Enfield) to Eldress Molly Goodrich (South Union), 20 October 1828, IV-B-19 (WR).

[11][South Union Shaker] Record A, 1807-1836, 6 January 1832, (WKU).

[12]Ibid., 1 January 1833.

[13]*Home and Farm Journal,* 15 April 1882.

[14]1881-1883 Journal, 27 May 1882.

[15]*Home and Farm Journal,* 15 April 1882; H. P. Byram, "An Essay on the Culture and Manufacture of Silk," in *Annual Report of the Commission of Patents* (Washington, D.C.: The Commission, 1847), Ex. Doc. No. 54, Appendix No. 10, 440.

[16]*Home and Farm Journal,* 15 April 1882.

[17]Eli McLean (South Union) to Respected Ministry (Mt. Lebanon), 8 August 1856, IV-A-62 (WR).

[18]1881-1883 Journal, 6 March 1882, 15 March 1882.

[19]John Nicholson, *The Farmer's Assistant; Being a Digest of All That Relates to Agriculture, and the Conducting of Rural Affairs; Alphabetically Arranged, and Adapted for the United States,* 2d ed. (Pennsylvania: Benjamin Warner, 1820), 340.

[20]1881-1883 Journal, 20 March 1882, 30 April 1882.

[21]Nicholson, 340; J. Orville Taylor, *The Farmer's School Book* (Albany: Hoffman and White, 1837), 131.

[22]John James Dufour, *The American Vine-Dresser's Guide, Being a Treatise on the Cultivation of the Vine, and the Process of Wine Making; Adapted to the Soil and Climate of the United States* (Cincinnati: S.J. Browne, 1825), 99.

[23]Nicholson, 340.

[24]Taylor, 131.

[25]Nicholson, 342.

[26]*Home and Farm Journal,* 1 January 1883.

[27]1881-1883 Journal, 20 May 1882.

[28]Taylor, 134.

[29][South Union Shaker] Diary, 1866, 2 June 1866, V-B-227 (WR).

[30]1881-1883 Journal, 21 May 1882.

[31]Elder Henry C. Blinn, "A Journey to Kentucky in the Year 1873," *Shaker Quarterly* 5 (Winter 1965): 115.

[32]Nicholson, 341.

[33]Byram, 447.

[34]Taylor, 122.

[35]Nicholson, 340, 343.

[36]Edward P. Roberts, *Manual , Containing Directions for Sowing, Transplanting and Raising of the Mulberry Tree ; Together with Proper Instructions for Propagating the Same by Cuttings, Layers, &c. &c. as also, Instructions for the Culture of Silk* (Baltimore: Sands & Neilson, 1835), 52.

[37]Nicholson, 343.

[38]Taylor, 343; Byram, 451.

[39]Nicholson, 244; Kax Wilson, *A History of Textiles* (Colorado: Westview, 1979), 19.

[40]L.P. Brockett, *The Silk Industry in America* (Washington: Silk Growers of America, 1876), 87; 1866 Diary, 13 June 1866; Byrum, 452.

[41]Brockett, 90, 91; Byrum, 451.

[42][South Union Shaker] Eldress Nancy E. Moore Journal, 1861-1864, 23 February 1864, (WKU); Record A, 29 July 1835.

[43]Dufour, 107; Brockett, 92.

[44]North and South Brick House Account Book, 1818-1820, II-B-59 (WR); Sarah Bates to Eldress Nancy E. Moore, 15 August 1869; 1866 Diary, 15 May 1866.

[45][South Union Shaker] Lucy Shannon Diary, 1871-1872, 1890, 11 September 1871; Moore Diary, 12 May 1864.

[46]Record A, 21, July 1836; Ministry (South Union) to Ministry (Mt. Lebanon), 16 October 1853.

[47]Sarah Bates to Eldress Nancy E. Moore, 15 August 1869.

[48]Record A, 18 June 1832, 1 January 1833; *Silk Grower,* July 1838.

[49]Dufour, 98; Brockett, 28.

[50]*Silk Grower*, November 1838.

[51]Mary Whitcher to Eldress Betsy and Eldress Nancy, 31 October 1873.

[52]Ibid.

[53][South Union Shaker] Necropolis, 126 (WKU). William Booker was a long standing member at South Union until his death in 1911 at age 70.

[54]John W. Perryman (South Union) to Ethel Baily, 24 December 1915, (SU).

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