The Factory Debacle: the Shirley Shakers Seriously Overextend Their Talent and Financial Capability

Stephen J. Paterwic

The lack of a pool of young Shaker men, who could be trained as leaders, came at a time when America was rapidly changing. When the Shirley Shakers entered the Era of Mother's Work in the late 1830s, railroads, factories, and immigration were in their early stages in Massachusetts. For example, the industrial powerhouse, Lowell, had only been incorporated as a town in 1826, the same year that the first railroad in the commonwealth was chartered. While the community looked heavenward to visions and entertained hundreds of Native American spirits, external changes literally began arriving at their doorstep. For example, the Fitchburg Railroad came to Shirley in 1845 and a station was built at the southern area of the town that became known as Shirley Village, less than a mile from the Shakers. Passenger and freight cars left and returned several times a day. For the very first time, the Shirley Shakers gained rapid access to Boston and other markets.

The town of Shirley had brooks and rivers suitable for running water-powered machinery. Saw and grist mills had always been a feature of life since first settlement, and then later carding and clothier's mills. In the early years of the nineteenth century, investors took the next step by setting up cotton mills. The town's first cotton mill was opened in 1812 on the Nashua River's tributary, the Catacunemaug River, less than a mile from the Shakers. This mill closed in 1834, but other mills, all relatively close to the community, had been built in the meantime. In 1829, when Shirley businessman Samuel Hazen (1797–1880) built a saw mill on the north branch of the Catacunemaug, this opened the area for industrial development. The Shaker reservoir would later be developed two to three hundred feet above this sawmill, and Hazen, as we will see, would become a business partner with the Shakers in the reservoir company.[1] It was not much of a leap for the Shakers to begin exploring what role they might play in such nearby endeavors. In retrospect, an honest look at the community's financial capability should have done by the trustees and the Harvard Ministry. The society did have some important resources,

SHIRLEY
SHIRLEY CENTER
SHIRLEY VILLAGE
WOODSVILLE
PAPER MILL VILLAGE
SHAKER VILLAGE
WEST GROTON
GROTON
LUNENBURG
LANCASTER
HAR
Squannacook Pond
Mulpus Brook
Catacunemaug Brook
Nonacoicus Brook
Nashua River
Dead Pd.
Tophet Swamp
North Bend Mill
Phoenix Co.
Cemetery
Town Clerks Office
Fitch's Bridge
FITCHBURG RAIL ROAD
H. P. Spaulding
N. Holden
H. N. Spaulding
J. Adams
E. Shamway
A. Hazard
S. Patch
O. Lawton
A. W. Holden
R. Hall
L. Hartwell
S. Barrett
W. Little
W. Dodge
Farnsworth
Hartwell
T. Whitney
M. Turner
J. Harlow
L. Wheeler
E. Bathrick
J. Lawton
J. Stewart
J. Reed
E. Warren
Z. Brown
J. Hazen
L. Dodge
Dr. J. O. Parker
Geo Davis
T. H. Parker
P. Holden
S. Holden
J. Harrington
W. W. Goodhue
N. Boynton
T. Balcomb
T. Peabody
T. Wellington
S. Hazen
D. Porter
E. Laffin
N. P. Sawtell
J. M. Parker
L. Saunderson
J. Shattuck
H. S. Wellington
O. Dodge
J. Lowell
E. F. Nutting
A. Whitney
N. Gilson
A. O. Holden
J. Hartwell
Hart

and by the standards of the day, they could be seen as very well off. For instance, they lived on farms that had no mortgages and in buildings that they mostly built themselves, using local materials that they had paid for ahead of time. They made brooms, sold herbs, and had a large garden seed industry. The sisters, moreover, made items for sale. Their gardens produced food, and they had animals for work, transportation, and meat. They also had an income from their saw mills in Lancaster and Lunenburg. For a small society, they could easily live within their means and still have a surplus, but never enough to build and maintain a textile mill.

The trustees at Shirley were simply unaware of how ill-prepared they were. By and large, they had never lived anywhere else but Shaker village. They had been apprenticed to tried-and-true older Shakers who were quite adept at the traditional Shaker seed, herb, and broom industries. As society became more complex, however, what may have seemed like great opportunities in manufacturing would only have been so if Shaker leaders had had the savvy necessary to deal effectively with businessmen from the world and sufficient capital to finance such a venture. Such financial and business sense was sadly lacking in Jonas Nutting, the principal Office deacon, or trustee at the Church Family. Born in Westford, Massachusetts, on April 7, 1802, Nutting was the son of Jonas Nutting and Martha Gould, who never married. His mother indentured him to the Church Family Shakers at Shirley on October 15, 1810, when he was eight years old. By that time, his father was deceased. Though the indenture ended on his fourteenth birthday in 1816, Nutting chose to remain with the Shakers and lived as a faithful Believer until his untimely death in 1873.[2] He was made a trustee of the Church Family in July 1832 and held this important position until October 1867. His predecessor had been the highly respected Nathan Willard, whose business acumen was legendary. Though Nutting may have received a great deal of guidance from his mentor, Willard was the product of a different era. Born in 1752, he was already thirty years old when the Shaker Testimony opened at Shirley, and his experiences were shaped in the late colonial and early federal periods. Indeed, he was well over sixty years old when the industrialization of Shirley was in its infancy. In contrast, Nutting grew up with the established cotton mills on

Fig. 1. (Opposite) *Detail of Shirley, Massachusetts, from Henry Francis Walling,* Map of Middlesex County, *Massachusetts, 1856.* Library of Congress, Geography and Map Division, G3763.M5 1856 .M3

the Catacunemaug River, and when he became a trustee, he was tempted by the prospect of making a great deal of money in manufacturing.

Initially his interest was modest. On January 20, 1840, on behalf of the Church Family, he bought a mill on the Nashua River in the northern part of Lancaster.[3] This had been the mill once owned by Samuel Rugg (1767–1852), "an original genius, who made improvements in machinery, which enabled others to make fortunes out of patents which of right belonged to him." In fact, he invented a power loom and wove yards of "good shirting cloth." This was done by turning a crank, "as the loom was designed to go by water power." This mill was in Clinton, Massachusetts, and it is highly likely that his small mill in Lancaster was a lumber mill.[4] In 1839, Rugg sold his mill to Isaiah Moore who sold it to Jonas Nutting the following year.[5] Running a small mill, already constructed, however, was far different from building a very large textile factory. Nutting and fellow trustee Leander Persons did not foresee the great catastrophe which awaited them. They were too caught up in the enthusiasm and praise from the world's press which remarked on the building of the cotton mill that, "the Shakers seem to be growing in wealth."[6]

The First Steps and Dedication

Before the Shakers could build, they had to secure the land and organize responsibilities. These are delineated in an 1849 memorandum of agreement between Shirley's Church and North Families "concerning the occupation and improvement of a certain water privilege located on the stream below the Fredonian Factory on land now owned and occupied by the North Family." The agreement outlined the digging and quarrying of stone, and each family consented to supply half the funds for the building of the mill dam. Trustees of the Church Family, moreover, were to supervise the construction of the dam and buildings, "the making of contracts, laying out the roads and engineering the mill site." Both families would own the property and share in the profits and pay taxes and insurance in proportion to the sums invested by the parties.[7]

As noted, the trustees of the Church Family, Jonas Nutting, and Leander Persons, handled supervision of the construction. On February 9, 1850, "Articles of Agreement" were drawn up and signed between Nutting and Benjamin Palmer (1816–1889), a stone cutter from Graniteville village in Westford, Massachusetts. Palmer agreed to furnish "good sound & of even color" granite for Nutting's factory and boarding house. This granite

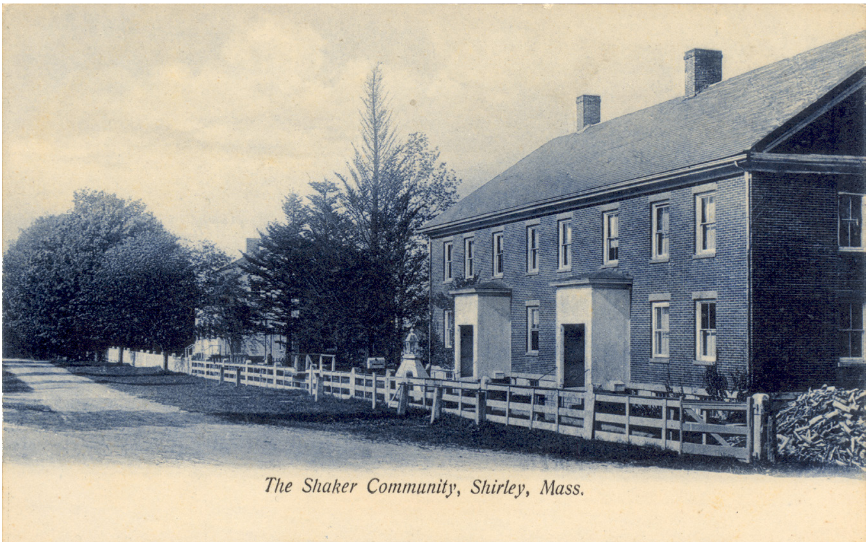


Fig. 2. *Shaker Trustees' Office at Shirley, Massachusetts.*
Communal Societies Collection, Hamilton College

would be made into window sills, window caps, door steps, thresholds, door caps, and underpinnings. All the underpinning stone work was to be done "in a good workmanlike manner" and placed by Palmer "on the cars at Westford stone landing" before June 1, 1850. The window caps and sills were to be loaded on the railroad cars on or before July 1st and all the other stone at the time that Nutting should direct.[8] From nineteenth-century photographs, it appears that the mill alone had about 125 windows and perhaps four major exterior doorways. Given the dimensions of the factory, not counting the boarding house, and using the price of fifty cents each for each sill and cap, and fifteen cents per foot for the underpinning, the total price of the granite was at least $200 ($6,742.00 in 2021).[9] The granite work, of course, was just a single aspect of the construction. The other materials needed included wood, bricks, and a waterwheel. In addition, dams and canals, etc., had to be built.

Notwithstanding their limited amount of money, the Shakers began constructing a mill "on the lower privilege of the Catacunemaug River, but a short distance above its junction with the Nashua River, and but a few rods below the Fredonia mill." The Shaker complex was the sixth oldest and largest cotton manufactory in Shirley. The building is still standing, though long used for other purposes. According to an account written in 1883, the brick superstructure measured 140 by 50 feet and was three full stories high plus an attic, at the time filled with machinery. "The whole structure was finished with care and expense," and "a fine-toned bell" is in the tower surmounting the building. "Connected with it are three blocks of brick houses, two stories high, and each block has four tenements … exclusive of these, is a large boarding house, built of brick, three stories high, and sufficiently large to accommodate all operatives, not connected with families, and who wish to be boarders." The mill began manufacturing in 1852 and in 1883 employed about one hundred people, many whom were immigrants, more than half females. By 1883, the mill ran 5,688 spindles (3,168 mule spindles and 2,520 ring and traveler spindles) as well as 130 looms. The mill manufactured brown and bleached sheeting with an annual capacity of 1,050,000 yards at full operation.[10]

Before the site was ready for manufacturing, the Shakers dedicated the building "by a religious meeting, in the Shaker form, in one of its spacious rooms." The dedication took place on May 17, 1851. It was attended by almost two hundred people, mostly from the Shirley and Harvard Shaker communities. Elder William H. Wetherbee opened the service and invoked "the blessing of God upon this place." He was followed by Elder Lorenzo Dow Grosvenor of Harvard who after he addressed the group, asked them to kneel in silent prayer. The *Daily Evening Standard* of New Bedford, Massachusetts reported, "A more beautiful and solemn scene is seldom witnessed than that presented by so many people kneeling in silence, in an open space." They all then rose and sang a hymn and later marched to quick songs. Thirty or more singers formed an oval facing each other and "the rest marched around them two deep, making one circle within another; after a while the inside circle faced around and marched in the opposite direction from the outside column." After they were seated, Elder Lorenzo and then Elder William Leonard addressed them. The morning exercises continued till noon when they took a break before resuming at 1 p.m. There was speaking, singing, and marching until 4 p.m. "The services were conducted by William H. Wetherbee as Elder, and Jonas Nutting as Deacon [Trustee], who distinguished the duties assigned in a manner highly credible to themselves, and to the great satisfaction of the spectators."[11] The dedication ceremony was a wonderful and fitting manner to begin such a large enterprise, but this event could rightly be seen as the high point since almost immediately, the factory became a losing venture.

Fig. 3. *The Phoenix Mill in 1883 from Seth Chandler,* History of the Town of Shirley, Massachusetts. Communal Societies Collection, Hamilton College

Fig. 4. *The bell from the Phoenix Mill.*
Photograph by Stephen J. Paterwic.

Money Borrowed from Shakers to Build and Maintain the Factory

It is not known how much of their own money the Shirley Shaker trustees initially sank into the construction of the mill. It was far from sufficient, however, because in order to complete the complex, Jonas Nutting borrowed $9,000 from various Shaker societies in 1850 and 1851.[12] This is the equivalent of $303,389.96 in 2021.[13]

Church Family, Enfield, Connecticut
1850: $2,500 1851: $1,000
South Family, Enfield, Connecticut
1850: $1,000
Hancock Ministry:
1850: $1,500
Church and Second Families, Watervliet, New York
1851: $3000[14]

The repayment of this debt by itself would have been daunting, but the Shirley trustees needed more money. The situation is described in a letter of September 1851 from Harvard Ministry elder Grove Blanchard to his good friend Joseph S. Tillinghast (1802–1876), a Quaker businessman in New Bedford, Massachusetts. Blanchard noted that the factory and the three boarding houses "cost more than anticipated" and Jonas Nutting had to borrow $3,000 from a local bank. This money had to be repaid "soon." It is likely that the term was for ninety days. Indicating the casual way he conducted business, Nutting waited till the money was due in two weeks before asking Blanchard to seek advice from Tillinghast. It seems, almost as an afterthought, that Nutting when he learned that Blanchard was writing Tillinghast, "dropped in a question" regarding getting a better source of financing for his debts. Nutting asked Blanchard to seek Tillinghast's advice in finding someone who had $3,000 and was willing to lend it for two or three years at lawful interest. They were even willing to pay a bonus on the loan if the amount could be obtained without going to a bank. Nutting and fellow trustee Leander Persons would be the security for such a loan. Blanchard commented that banks lent money for only "a few months" and "they [the trustees] thus have to do it [borrow] over and over."[15] This query seemed a roundabout way of asking Tillinghast directly for the loan. In any event, it does not appear that Tillinghast or his business connections came forth with any money. Consequently, Nutting was forced by circumstances to borrow $1,500 from the Harvard Shakers in January and February of 1852.[16] This amount may have been used to reduce the money needed for additional bank loans.

That the Shirley trustees borrowed from banks and admitted it, must have been quite problematic for the Lebanon Ministry. This was in direct violation of Shaker rules, and is yet another indication that the Millennial Laws of 1845 were being ignored.[17] Section IV, #6 of "The Order of Deacons or Trustees, and The Duties of Members thereunto," clearly states that "Believers must not run in debt to the world."[18] Jonas Nutting would have been very familiar with this passage because these laws governing Shaker life were read to the community at least once a year. Ignoring this wise counsel led to an ever-growing debt that could not be paid off. Before offering the reasons why the debt soon got completely out of control, however, it is very helpful first to discuss the company to whom the Shakers leased the factory.

From the New Bedford Steam Mill Company to the Phoenix Cotton Manufacturing Company

The intention of the Shakers was to build the factory, and then either buy the necessary machinery and run it by hiring outsiders or lease it to a company that would staff the mill and furnish the machinery. They choose the latter course of action, and the buildings and water privilege were rented to a firm called the "New Bedford Steam Mill Company." When they began operations in Shirley in 1852, the firm adopted the name "Phoenix Cotton Manufacturing Company" or more commonly, just the "Phoenix Company." The name Phoenix Company was likely chosen because it signaled the rebirth of a failed steam powered cotton mill in New Bedford to a water-powered complex in Shirley.. The phoenix, a symbol of hope and reborn idealism, proved ironic however. The factory was a phoenix because it arose in a new location and could be "a thing regarded as uniquely remarkable in some respect," but it worked out in the opposite manner of the way the Shakers had hoped.[19] Rather than providing them with a nice profit each year, it immediately proved to be a never-ending drain on their inadequate sources of income.

The Shirley Shakers got involved with Steam Mill Company due to their missionary efforts in New Bedford, a town one hundred miles away and situated on the Acushnet River at Buzzards Bay on the southern coast of Massachusetts. As noted, New Bedford businessman Joseph S. Tillinghast had been a friend of the Harvard Shakers for several years by 1852. He most likely first heard of Believers in the late 1840s from fellow Quaker Robert White, Jr., (1792–1856), a very successful New York business leader. White had entertained an interest in the Shakers for almost thirty years before joining the Hancock Shakers in the early 1840s, though he did not live in the community.[20] Robert White and Joseph Tillinghast's friendship was firmly established by 1849, and the Shakers were a common interest.[21] Typical of new converts, Tillinghast developed a great enthusiasm for the community and wanted to visit as many Shaker societies as he could. Though he corresponded with Shakers at New Lebanon and Enfield, Connecticut, and elsewhere, he confided that he wanted to join at Harvard. In addition to Ministry elder Grove Blanchard, his principal contact there, he became friendly with Elder William Leonard (1803–1877) of the South Family, the community's Gathering Order. Leonard claimed that Tillinghast would join them if his wife Ann Tillinghast (1800–1885) also wanted to be a Shaker or if she died. Elder William also stated that Tillinghast was worth $15,000 and "owes not a cent."[22] Since the Shakers needed capable adult men and Tillinghast was a successful businessman, his interest in them seemed providential. The Harvard Ministry lost no opportunity in cultivating his friendship and visited him at his home in New Bedford, and Elder William conducted at least one religious meeting in the town in 1849.[23] It was only natural, therefore, that two years later, the Harvard Ministry would seek Tillinghast's advice about how to run their new mill, which was ready for occupancy. In the relatively small business world of New Bedford Quakers, it is not surprising that Tillinghast would be familiar with a failing cotton mill in New Bedford that needed a fresh start.

Samuel Rodman (1792–1876) is considered the father of cotton manufacturing in New Bedford, since he had the idea of building the town's first cotton mill in 1845. Up until that time, the whaling industry had taken precedence over any other business in that place. With the decline in the use of whale oil for lighting, and the example of successful mills in nearby Fall River, Massachusetts, Rodman decided to give up whaling and build a mill at his wharf. The General Court of Massachusetts, on February 3, 1846, incorporated Samuel Rodman, Alden G. Snell (1808–1886), William Rodman Rotch (1788–1860) and their associates and successors as the "New Bedford Steam Mill Company."[24] The company began operating in November 1846 and ran 7,500 spindles. Rodman kept a diary and lamented his business difficulties because the venture lost money due to disputes about wages, insufficient capital, and what he thought was a lack of efficiency of his selling agents in Boston. It was more than he could handle and the mill was not a success.[25] As it was failing, the company directors looked for alternatives to save their investment.

Dennis Pratt (1797–left 1864, d. 1866) was the trustee of Shirley's North Family and in January 1852, he visited New Bedford and met with Alden Snell, overseer of the Steam Factory, which had stopped production. Snell gave Pratt a letter stating that they would like to sell all their machinery to the Shakers. Though he claimed that the machines originally cost $100,000, they had been used for four years so he offered them for $50,000. Pratt and Nutting then consulted Elder Grove Blanchard of the Harvard Ministry about their plans. They already had two offers to lease the factory for a short term, but they wanted to know if the owners of the Steam Mill Company might be interested in leasing for a longer period. Moreover, they sought advice on how to proceed since they did not want to appear too eager and thereby cause the company to ask more than they would have offered otherwise.[26] Elder Grove Blanchard, on January 20 and 21, 1852, asked Tillinghast for advice concerning the character of Alden G. Snell. Several businessmen of New Bedford had written recommendations on what the Shakers should do and Blanchard sent these to Tillinghast as well. He was glad to oblige and said, "I am very happy that you wrote me on the subject as I am well acquainted with Samuel Rodman, Alden G. Snell, and George Husing [Hussey] (1791–1868) the acting men in the Concern." He further stated that he knew "as much about the Machinery & Factory as anyone perhaps {owners excepted}" since he had "insured it from the Commencement, and "very totally Insured $26,000 on this Machinery."[27] Also, on April 8, 1846, a little more than two months after the New Bedford Steam Mill Company had been incorporated, the enormous Wamsutta Mills of New Bedford were incorporated and one of its directors was Pardon Tillinghast, a cousin of Joseph S. Tillinghast.[28] Shaker-hopeful Tillinghast, therefore, would have been familiar with cotton mills from his business relationship with his Quaker co-religionist Rodman and from his cousin Pardon with whom he was friendly.

The Shakers had been offered the chance to buy the machinery of the Steam Mill Company but the ever-prudent Tillinghast cautioned them "to have no part or lot in it as owners without you have some <u>Experienced</u>

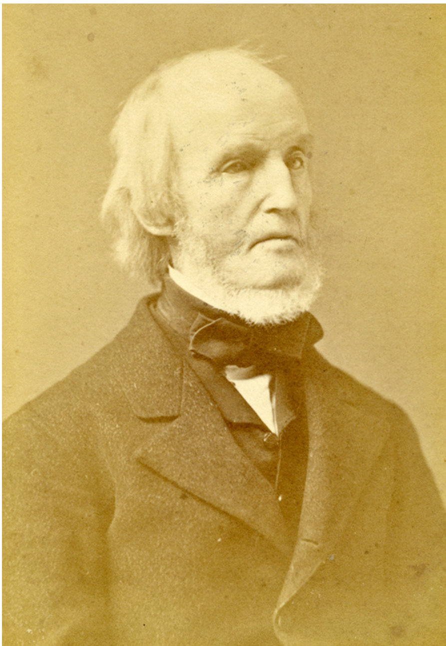


Fig. 5. *Samuel Rodman, undated. Carte-de-visite. George F. Parlow (photographer).* New Bedford Whaling Museum Photography Collection, 2000.24.03. Image courtesy of the New Bedford Whaling Museum.

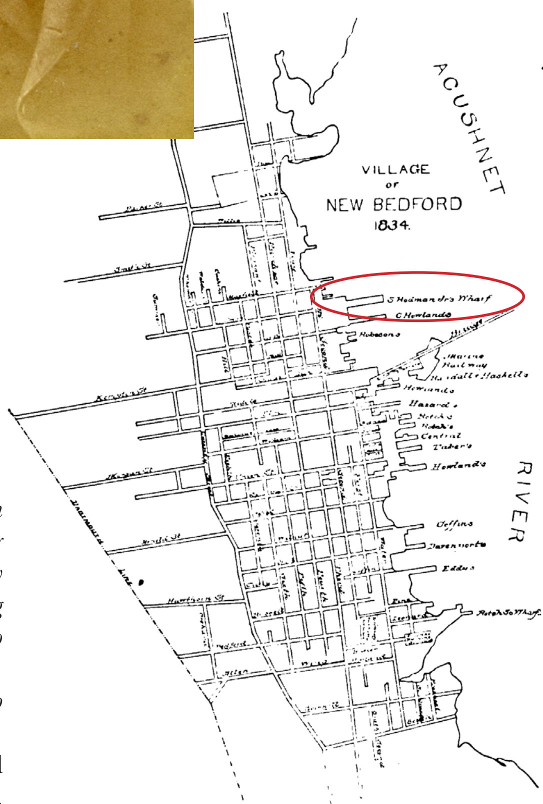


Fig. 6. *Rodman's Wharf in New Bedford (circled). After the Steam Mill Company moved to Shirley, the building on wharf was converted to the New Bedford Flour Mill, opening January, 1856. Map from Leonard Bolles Ellis,* History of New Bedford and its Vicinity, 1602-1892.

Machinist who can Judge of its value at the present time." He also confided that he had "heard that they would do well if they could sell for $33,000." After all, they were asking $50,000 for machinery that was insured for just $26,000. Finally, he advised the Shakers to rent their mill to them and not purchase any of the machinery for the present time. He promised to "see to all of its parts for your Interest as soon as I can."[29] Tillinghast immediately contacted Alden Snell and George Hussey who were "pleased with my Interest in letting them know about your Mill at Shirley." Snell was so anxious to see the mill that he made plans to accompany Tillinghast to Shirley in two weeks to inspect the premises. Tillinghast warned the Shakers that Snell was a Baptist and not aware of his "Intimacy with Believers." Tillinghast felt it best if Snell did not know this and hinted that Snell might not like it. He wanted to please Snell and Hussey as well as the Shakers, as it would be "a double pleasure to me."[30] Trusting in Tillinghast's friendship and business experience, and anxious to make a great deal of money, the Shakers followed through on the plan to rent their factory to the New Bedford Steam Mill Company. This was accomplished because Snell could not raise funds from "a local capitalist" in New Bedford and Rodman was "much pleased with Shirley, and with Believers, but thinks … that Believers are a Strange People." Tillinghast promised to see Rodman often and offer him "some Light."[31] The agreement was completed shortly after March 1, 1852. The machinery was moved from New Bedford to Shirley, and the company took possession of the mill on September 1, 1852. As per lease, the first rent payment was $1,531.25[32] Not of concern to the Shakers, but indicating their inexperience, the trustees signed a fifteen-year lease that would soon leave the community open to lawsuits at the whim of the factory's superintendent since the Shakers guaranteed to provide sufficient water to power the mill. Agreeing to this, in effect, sealed their fate, assuring that they would never make a large profit from the business.

The Troubles Begin

From the beginning, the company faced difficulties obtaining "good and skillful operatives in the various departments" and this hampered the ability of the company to make a profit.[33] The honeymoon period barely lasted six months before superintendent of the factory Alden Snell's "conduct in the Factory business" became a concern and Tillinghast had a conversation with Rodman and Hussey about the matter. He felt they had a very high opinion of the Shakers and, in turn, the Believers would do all they agreed to do. He felt he could mitigate the situation to the satisfaction of all.[34] The situation did not improve and on March 25, 1853, Snell sued the Shirley trustees for $6,000. Snell claimed that production had been hampered by backwater, a lack of a current in the raceway.

Snell's lawsuit was supported by Samuel Rodman, and this "surprised" Tillinghast who promised to meet with him. He also advised the Shakers to "consult judiciaries & cautious men to make arrangements to satisfy all."[35] Blanchard received information from Rodman's lawyer who thought the Shakers' cause was "good" except for "ensuring them water power, on which we [the Shakers] stand beholden." One possible solution was to shift the blame to a man who raised his mill dam two feet, thus possibly preventing the water from the Shaker factory's raceway from discharging itself properly and resulting in the back up at the Shaker factory. If the operator of the mill on the Nashua drew down the water two feet and that solved the problem, then the Shakers felt confident. If this failed to make a difference, then the Believers would have to widen the raceway.[36] The owner of the dam was Peter Page (1829–1892). His father, also named Peter Page (1797–1840), in 1836–37 had constructed a saw mill on Mulpus Brook, "a few rods above its junction with the Nashua River." The senior Page died intestate in 1840 "and the ownership of the mill passed that state of fluctuation which awaits embarrassed property."[37] The junior Page was only ten years old when his father died, and it appears that his father's real estate was sold to pay off debts.[38] It is not clear that the twenty-four year old Page actually owned the saw mill when he raised its dam, but he was held responsible nonetheless.

Another, and clearly the worst, problem remained. Shaker leaders claimed that "Snell and his machinist and overseer are inadequate to the task of running a water power mill as well as to managing the drawing of the water etc. etc."[39] Tillinghast thought that Snell "was a good Blacksmith," but questioned "how and when did he ever get any knowledge about a Factory."[40] They were concerned that these men may have allowed oil to get into the water, and let the pond run down by drawing more water than needed and thus choking the water wheel. In addition, they were blamed for not warming the mill by steam (to prevent ice on the wheel) and lacking the experience to keep the regulator in order.[41] The Shakers did not want to go to court, but at the same time wanted to discredit Snell. They asked Tillinghast if his cousin Pardon or some other person in New Bedford could help them sort out the situation. The Shakers felt that if they could only meet the officers of the company without Snell, all could have a "social chat" and agree that Snell was more to blame than Believers. That the Shakers thought that a nice conversation would obviate the problem indicates their naivete. This is even more evident when it is realized that before signing the lease, Snell had allowed the bond run out, but the Shakers signed anyway and thus saved the company a lot of trouble.[42]

Not surprisingly, Pardon Tillinghast claimed no knowledge of Snell and refused to help. Joseph Tillinghast thought the best solution was to employ a couple of competent men who were familiar with cotton factories, water power, and machinery. After looking at the factory they could then submit their findings to a committee, one member chosen by each side and then a third chosen by the first two. He strongly cautioned the Shakers not to take Rodman to court since he could be "very determined." Rodman agreed to arbitration and was "very pleasant" but maintained that he and the company only wanted what the Shakers had promised they should have in the lease. In addition, Rodman did not think it their job to sue the person with the raised dam on the Nashua. Also, he recalled that a consultant named Whitman, "considered by Manufacturers a very competent Man in Factory business," had told the Shakers that the raceway was not wide enough, but the Shakers had disagreed. Once more, the trustees were so anxious to begin manufacturing that they had ignored valuable input.[43]

Alarmed by the lawsuit, Shaker leaders came to Shirley to investigate the matter during March and April 1853. Visiting from New Lebanon, elders Daniel Crossman, Frederick Evans, and Richard Bushnell discovered that, as noted, due to a lack of business knowledge, Jonas Nutting had signed a lease that contained a very troubling clause wherein the Shakers assumed total responsibility for furnishing enough water power to run a certain number of looms. This "deficiency in their agreement" opened them up for problems. Nutting complained "how the brethren at Shirley were taken in" by the company. He said that when "the overseer falls behind in his manufacture of cloth and is like to loose [sic]," he "tries to make out that there is a lack of power in consequence of back water." Soon after, New Lebanon trustee Jonathan Wood of the Church Family and Elder Richard Bushnell went to Shirley to attempt to help. They reported to the Lebanon Ministry that Shirley "will have to spend several thousand dollars before the company will be satisfied." Watervliet trustee Justice Harwood came to Shirley less than two weeks later. There he met trustee Caleb Dyer of the Church Family, Enfield, New Hampshire.[44] Water power expert Ezekiel Albert Straw (1819–1882) of Manchester, New Hampshire, also attended at the request of David Parker, trustee of the Church at Canterbury.[45] Clearly, the Shakers were calling in some of their best trustee troubleshooters to help Jonas Nutting extricate the community from such an untenable situation.

No longer dealing with the inexperienced and weak trustees of Shirley, Snell and the company quickly realized that they were suing the wrong people. When negotiations finished, the parties came to an agreement that if the Shakers widened the raceway and built a new dam, then the company would release them from the obligation to supply water power. The Shakers saw this turn of events as "the hand of the Lord … stretched forth for our deliverance in this thing." They thought it "impossible to believe the Agent would have released us from our obligation" if not for the "ardent desires and prayers of the righteous who inhabit Zion below." About ten days later, the company's treasurer and agent called at the Office of the Church Family and informed the Shakers that they were dropping the lawsuit against them. Instead, they were suing Page, the owner of the dam on the Nashua who refused to lower the water level, and whose pond continued to cause backwater. The Shaker commented "Poor Page," who was called on by an officer who left him a writ to answer "for his folly." It seems that the company would have its victim one way or the other.[46] Page, for his part, tried to secretly draw down his pond for a time at night since he did not want it to be known that he did it just as the Shakers were finishing digging their new raceway and building their new dam in July 1853. No doubt he was trying to avoid blame by making it seem that the enlarged Shaker raceway had solved the problem and his dam was not the cause of the backwater, but this ploy did not prevent the company from seeking satisfaction from him.[47] In the meantime, the company was "much pleased" with the factory and the waterwheel worked quite differently with just three or four inches of water.[48]

The Harvard Ministry estimated that the new expenses "touching the factory reservoir & lands" would be between $4-5,000. The New Lebanon Ministry advised them not to borrow any of this from the World, but get it from other Shaker communities.[49] Consequently, $4,500 was borrowed from:

East Family, Groveland, New York	1853	$2,500
Church Family, Watervliet, New York	1853	$1,000

North Family, New Lebanon	1853	$1,000

Earlier in 1853, $800 had been borrowed from trustee Simon Atherton of the Church Family Harvard. This made the total borrowed in 1853 from other Shakers $5,300.[50]

The rent from the Phoenix company was paid semi-annually on installments of $1,652.35 on March 1 and September 1. This yearly income of $3,304.70 was not sufficient to cover losses. As circumstances worsened, the Shirley trustees again borrowed more money from their fellow Believers.[51]

Church Family, Enfield, Connecticut	1854	$2,000
North Family, Enfield, Connecticut	1854	$2,000

The additional money, $9,300 total in 1853-54, is $313,502.96 in 2021 dollars.[52] By the end of 1854, their total indebtedness to other Shaker communities was $19,500, or $667,475.92 today. The interest rate was 6 percent compounded annually. By April 1861, none of the money had been repaid, so at simple interest, the debt had grown to the equivalent of $896,266.98 owed to other Shaker communities. As we shall see, this staggering amount, did not include the large sum borrowed from the World from 1856 onward.

The Factory, November 1855

Alden Snell continued to complain and mismanage the factory. Tillinghast remarked in April 1855 that he was "prepared to believe most anything I hear about Snell, that gain to prove his weakness, and want of common sense and judgment." He was surprised that Rodman and Hussey "trust him to manage this business for them."[53] By October 1855, however, Rodman had a serious talk with Snell because he had cost the company at least $25,000.[54] John K. Chase (1812–1879), a machinery expert from Lowell, was called to evaluate the factory and reported his findings on November 21, 1855. He compared the Phoenix Mill to a mill in Lawrence, Massachusetts, which manufactured a similar quantity of goods. His report is detailed and technical, but it offers some valuable information about the operation of the mill and its condition. It is evident that running a mill involved a great deal of technical expertise that Alden Snell did not necessarily have. If Snell had been an able operations manager, many of the recommendations made by Chase would not have been necessary. When he lost the company at least $10,000 by selling goods without liberty, George Hussey, an owner of the Phoenix Company, admitted that Snell was "not fit for an agent." Joseph S. Tillinghast then suggested that company vote him an annual salary of between $1,000 and $1,500 and "have him do nothing & pay a man who is capable."[55] Chase reported:[56]

1. The spinning mules produced 1,215 yards of cloth per day and ran 10.5 hours a day with sufficient time for cleaning.
2. The speed of the 130 looms in the weaving room was 112 clicks per minute and each loom produced 26.5 yards of cloth per day. The looms should have been producing 28 yards per day if the speed were increased to 118 clicks per minute, not a great speed as loom were generally run. An additional twenty-four more looms would have to be added if the company wanted to increase production as planned.
3. Exactly 97.53 or about one hundred horsepower was used: 83.53 percent to drive the machinery and the remainder to drive the shafting. Twenty-four more looms would require three horsepower more.
4. A good water wheel should give 75 percent executive (actual) power with 55-60 cubic feet of water needed per second. The fall was nineteen feet.
5. The speed of the water wheel was 5.5 turns per minute or 6.62 feet per second due to overfilling the buckets. A speed of seven feet per second would be better.
6. The wheel was not of sufficient power to drive the machinery regarding the greatest economy of water because the buckets (blades) were filled more than two-thirds. This caused the water to pile up on the "brest" or apron of the wheel and a consequent loss of power.[57]
7. The carding and spinning rooms supplied more yarn than 128 looms could weave so they should be operated more slowly or stopped in part.
8. The shafting was in good condition and no more power was needed to drive them.
9. The floor boards in the carding room were in good condition and should last more years. The timber was not in good condition, but with repairs could last several years.
10. Improvements could be made in the gates of the wheel and the flume strengthened. The segment wheel should have its bottom teeth chipped and filed because the wheel shook the floor and could cause injury.

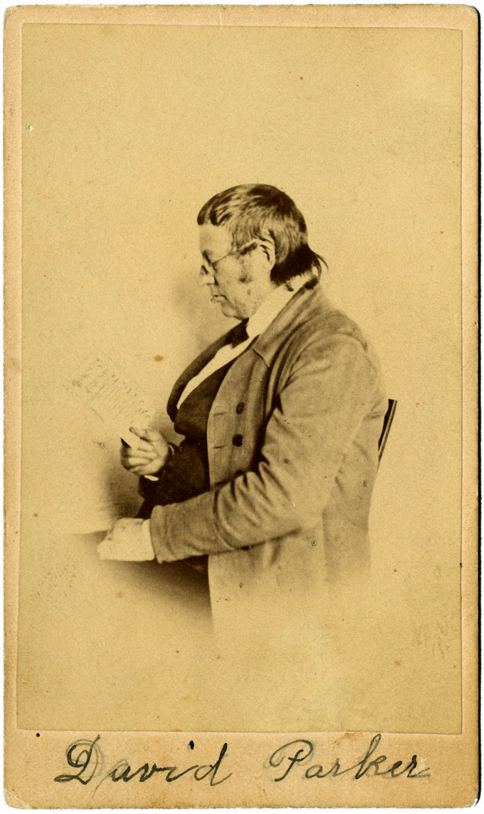


Fig. 7. *Shaker Trustee David Parker.*
Communal Societies Collection, Hamilton College

11. Putting too much water on the wheel would just waste water, not harm the wheel.
12. The bulkhead was not strong enough to support the weight of water and never was sufficient to prevent it from shaking. This injured the wheel's operation by preventing it getting close enough to the breast or apron.
13. The speed of the main cylinder of the carding machine should be increased from 120 revolutions to 130 revolutions per minute. Also the slubber (twister) of the fly frame (device used to reduce the diameter of the sliver or carded material in preparation for final spinning) ran fast at 110 turns and should be reduced to between 90-100 turns.

14. When the gates of the sluiceway are fully opened the regulator should control the flow into the buckets to prevent waste of water. If the speed slows, some of the machinery should be stopped.
15. Ice could collect on the rims of the wheel and coat it enough so that it crowds against the breast. The journals boxes (housing for the shaft) was not originally fastened to the stove as it should have been. A good willow (scraper) or opener would increase power by 1.5-2 horsepower.
16. To reduce the power needed a little, the main drums of the shafting and the pulleys should be covered in leather. This would mean that the main belts would not have to be so tight.

Fig. 8. *Samuel Hazen from Seth Chandler,* History of the Town of Shirley, Massachusetts. Communal Societies Collection, Hamilton College

Collapse of the Reservoir

Perhaps the brightest part of the report made by Chase was that the factory had sufficient water available to run the machinery. This, as noted, was due to the efforts made by the Shakers to rebuild the dam of their main reservoir in 1853. There were actually four reservoirs, one of which was never filled. The other three, according to Chase collectively measured 620 acres and held 219,592,400 cubic feet of water. To supply the mill with water for twelve hours required fifty-two cubic feet of water per second or 2,296,900 cubic feet per day. Thus, the reservoirs could safely supply 97.33 days of water. The factory operated 310 days a year. The Catacunemaug River supplied enough water to run the mill 170 days without the reservoir. If the reservoir was drawn down twenty-six cubic feet per second, an additional one hundred days would be gained. The remaining forty days could be supplied by drawing down the reservoir by fifty-two cublic feet per second. Chase found that "the supply is fully equal to the consumption," but he made it clear that his findings were based "on the assumption that the economy and management regulating water is strictly adhered to."[58]

The Shaker Village Reservoir Company was formed on May 7, 1852, four months before the factory began operating. The ownership was divided among various parties. The Shirley Shaker trustees owned one-half of the company. Three local businessmen owned the other half. Samuel Hazen, owner of the saw mill near the foot of the reservoir dam, had one-fourth interest while Israel Longley (1803–1871) and Willard Worcester (1796–1860), owners of the Fredonia(n) Cotton Mill, each held one-eighth interest.[59] As noted, the Shakers had agreed to widen the raceway and modify the reservoir dam in order to have the factory company's lawsuit dropped in May 1853. The raceway was doubled to twenty feet wide, and to make sure that the mill always had enough power, between May and September 1853, a new reservoir dam was constructed which impounded water in a reservoir upstream near the Lunenburg/Shirley town line.[60] Once again, the Shakers' lack of experience came into play. This new construction required additional funds, which the Shakers did not have. All the same, Samuel Hazen got the Shirley trustees to assume half of his one-fourth interest. This made the Shakers responsible for five-eighths, or a majority share, of the reservoir company, and of course for more of the expenses. Hazen, Nutting, and Persons signed the agreement on May 23, 1853, right after the lawsuit was dropped.[61] It is difficult to understand why the trustees agreed to take on additional expenses and let one of their partners reduce his liability. Perhaps in the euphoria of having the lawsuit dropped, they were not thinking clearly, and at the same time figured that nothing else could go wrong so why not assume an extra share of the Reservoir Company? For whatever the reason, the Shakers agreed to the document which specified that they were subject to "paying all expenses & bearing all the burdens & liabilities henceforth incurred upon said eighth part." Even more incredible is that the agreement allowed Samuel Hazen to draw water from the reservoir for his sawmill, located directly below the dam of the reservoir. He was permitted to draw water "seasonably" and "forever, whenever the water is not drawn down from the new dam."[62] Thus Hazen could use the water when not in use for the factory. In every way, he took advantage of the "green" trustees who should have learned by experience from their dealings with the businessmen from New Bedford. From a worldly perspective, however, Hazen, could be commended because he avoided liability and expense while getting to use the reservoir water for his own mill.

On the opposite end of the Shaker mill, a tail race was dug to carry spent water to the Nashua River. The entire length of this channel was lined with elms.[63] Paying for the new mill race and more than half of the new dam, put the society in a precarious financial situation. Loans from the Shakers went unpaid as that money was either spent or used to pay a portion of what was owed to the world. This was the situation when an unbelievable disaster occurred. On July 2, 1856, the reservoir dam gave way and "the mass of water which it had held in reserve poured down the valley, overflowing its banks, and inundating fields and meadows with its turbid waves. Four road bridges, five mill-dams, two blacksmith shops, one saw-mill, and some smaller buildings, with one railroad bridge, were swept away, and other structures were partially undermined and injured." The estimated loss was about $50,000.[64] The day after the tragedy, the *Lowell Daily Citizen and News* provided a detailed description of the event. The inundation happened in the morning of July 2 as the stone and gravel dam gave way, releasing the pond which held between seven hundred and eight hundred acre feet[65] of water. "The water had been working through the gravel dam for some time and was discovered by a stranger" when suddenly the dam caved in and he "only escaped with his life." The water rushed down "to where the railway crosses the valley on a high [bridge] but with a small culvert underneath; this checked the rush of the flood for three hours [,] giving the people below time to cut away their dams at each end and tear out the flumes; this alone saved the mills from destruction."[66] The panic and dread can only be imagined as close to 250 million gallons of water stalled at the railroad culvert before crashing through to make its way to the river. Ten days after the calamity, the *Boston Cultivator* wrote that the dam break had caused "considerable damage" since the flood carried away six dams and six bridges between the reservoir and the Nahua River. The fork factory of Pope and Hurd[67] and a blacksmith shop were totally swept away, and the total damage estimated to be between $10,000 and $20,000 in addition to the loss of work during the next two months. The paper claimed that the Shakers owned half the reservoir and the water power below the dam.[68] The greatest expense to the Phoenix mill was the breaking away of the west embankment of the raceway to the depth of six feet for a "long distance."[69]

Why the dam broke has remained a mystery since it "had braved all the force of the spring freshets, and at the time of its failure the water was two and a half feet below the mark of high water."[70] Though it cannot be proved now, those who built the dam most likely had taken shortcuts when the dam was constructed. If the dam was stone and gravel as indicated by the newspaper account, unless the foundation was large and thick, serious seepage would have occurred.[71] Since the dam was only three years old, its failure shows that something was seriously wrong in its design. Once again, the Shakers knew little about how a dam of this magnitude should have been made and trusted others. As terrible as the damage was, however, it could have been worse. Only three months before the collapse, the trustees of Shirley had requested to raise the reservoir dam two feet to accommodate four extra looms to increase production. This request was denied by a meeting of the board of the Phoenix Company.[72] Had the Shakers heightened the dam, more pressure would have been exerted on an already failing structure and two feet of additional water would have caused more destruction. In any event, a new dam of tremendous strength was immediately constructed. It was of high quality and, of course, expensive. The Shaker portion of the cost of the new dam was $6,000, almost two years of rent payments.[73] Thousands of dollars in damages also needed to be paid to the railway company and to those who lost property. In addition, in March 1856 the board of the Phoenix company had demanded that the Shakers provide a more efficient water wheel or "in some way to secure the Company a greater supply of water or means of securing it." If the Shakers failed to comply, the company would order "the prompt adoption of coercive measures to compel their compliance with the terms of the lease." This was the board's response to the request by the Shakers to have the agent (company) repair the damaged water wheel. The company claimed the Shakers had failed to heat the wheel house properly and thereby causing the frost to build up on it and cause a dangerous accumulation of ice on the wheel.[74] It is evident from the minutes of the meeting that the Shakers never had a chance at a fair hearing against the shrewd and uncompromising board. With the collapse of the reservoir dam just four months after the board meeting, the year 1856 must have been quite a dark one for the Shirley trustees.

The Debt Balloons to $50,000

The Ministry of New Lebanon figured that Shaker liability due to the collapse of the reservoir was $5,000, and they asked the communities to help. They said, "all things considered, all that can be done for a donation must be given to Shirley." It was proposed that "those societies which had lent them money to deduct a suitable sum, and for those who had not, pay in something." In the meantime, Enfield, Connecticut, had already given $200 in November, 1856, making the total contribution from that society $8,700 since 1850. The proposal was that New Lebanon give $700, Watervliet $500, Groveland $300, the Hancock Bishopric (Hancock, Enfield and Tyringham) $1,000, Harvard $500, and the New Hampshire societies, "with a little from Maine," $1,000. It was hoped that this would enable them to get along without borrowing more money from the World, a violation of Shaker principles.[75] It is not clear how much of the $5,000 was ever raised. Records indicate just $945 was donated.[76] This hesitancy to loan more money is understandable given the fact that the previous Shaker loans had never been paid back, and the possibility that they ever would be now seemed remote. For example, on May 23, 1853, trustee David Parker of Canterbury lent Jonas Nutting $500 at 6 percent interest. A year later, Parker requested payment of at least the interest of $30. He wrote reminders to Nutting on July 3 and August 7, 1854, and never got a reply. On November 1, Parker aired his complaints to Elder Grove Blanchard. He said, "I feel that he does not do right by me, not ever to answer my letters. Is the factory, as has been always represent to me, yielding income enough to more than pay the Interest as falls due? I borrowed this money for Jonas and am bound to pay interest. If br. Jonas is suffered to let Interest accumulate the sooner you get rid of the property the better in my opinion." Nutting was truly taking advantage of David Parker's excellent reputation as a businessman, for earlier Parker had stood as surety for Nutting for $4,500 borrowed from men of the World.[77]

Since the money could not be obtained from other Shaker communities, the Shirley trustees began borrowing very large sums of money from the World. Up until the collapse of the reservoir dam, their indebtedness to the World had been relatively small. They owed the other Shaker societies, as noted, about $20,000, not counting interest charges. The average yearly amount they received from banks was about $3,000 and about $1,200 from individual local people. This indebtedness ration of 5:1, Shaker versus the World completely changed after the reservoir gave way. For example, from February 16 to March 1, 1857, the Shirley trustees signed nine bank notes for $3,350. By April 1, 1857, $6,116.68 was owed to Scituate Savings Bank and Lancaster Savings Bank and $13,557.47 to ten individuals who had lent them money. The amount of indebtedness to the world had jumped to $23,024.15. At the same time, the money owed the other Shakers totaled $25,504.47 with interested charges included.[78] Taken together, the society owed $48,528.62 or $1,555,000 in 2021.[79] In a very short time, the indebtedness ratio of Shaker versus the World had become 1:1.

Since 1850, Nutting had set a pattern of appealing to other Shaker villages and borrowing from the World with very little headway made to really pay off anything owed. With the collapse of the reservoir, the situation intensified, especially as the railroad sued for damages. The New Lebanon Ministry lamented that this "will have to be met in some way." The proposal that the lawsuit could be put before "referees" they thought was "a good idea."[80] Once again, leaders from other Shaker villages were consulted. Watervliet's Chauncy Copley and Justice Harwood felt that there was a consensus to sell the factory "if it can be put in a right shape so as not to make too great a sacrifice."[81] This decision was praised by the Canterbury Ministry. Writing from Enfield, New Hampshire, they said, "We rejoice in the agreement of the brethren in the sale of the property and hope that your minds may soon be relieved from burdens resulting from that perplexing and vexatious property."[82]

In November 1856, Brother Thomas Holden of Harvard and Jonas Nutting were appointed to investigate selling the factory by Watervliet trustees Chauncy Copley and Justice Harwood. The proviso was that they were "to look about and make the sale if they could, and get enough to repay their debt."[83] Unfortunately, this was not done in a timely manner. It is curious, that Nutting, who had been so incapable, was chosen to help find a buyer. Nutting's lack of business sense may have caused the delay, but, in the meantime, many other misfortunes arose to tax the abilities not only of the remaining leaders of the Harvard bishopric, but in many other parts of Shakerdom as well. For example, at Harvard a great deal of turmoil had resulted from the introduction of the concept of spiritual marriage. This course of action would have allowed select Shakers to marry and have children. It was, of course, contrary to the foundational principle of Shakerism, yet the topic gained traction in a few of the communities, but caused lasting damage at Harvard. For instance, in October 1862, the man appointed to help sell the factory, Thomas Holden, age forty-one, left the Harvard Shakers to marry fellow Shaker Louisa Blanchard, age fifty-two. Both had held important roles in the Ministry and eldership. Moreover, the Harvard society was under great financial stress due to the building of an extravagant dwelling house at the North Family. This small family did not need nor could they afford such a structure. In 1863, the New Lebanon Ministry reported that the North Family, Harvard, was in debt and that the Church Family there had already paid $10,000 worth of the debt so far.[84]

Possible help was offered to Shirley early in 1857 by the Connecticut Shakers. The Shirley trustees owed the largest amount to them, and it was in their best interest to help sell the factory so that they could recover their loans. As a result, the trustees of Enfield introduced the Shirley trustees to Euclid Chadsey (1805–1864), president of a bank in Wickford, Rhode Island, and a "man of wealth" and a "great financeer" [sic]. Just as Chadsey was helping the Enfield Shakers with their seed business, so too they felt he would be glad to assist their brethren at Shirley. Blanchard found him "kind hearted" and was confident that Chadsey could find them a buyer, and that Tillinghast would help him do so. Chadsey supposedly knew Tillinghast by "cite" [sic].[85] Apparently, Chadsey consulted a local shoe manufacturer named David Whittemore (b. circa 1801) about the value of the mill. He was disappointed to find its appraisal lower than he expected. Whittemore thought it worth $12 a spindle, including real and personal estate. Chadsey also informed the Shakers that Samuel Rodman was aware that the Shakers were trying to sell.[86] If the factory had about five thousand spindles this would mean the complex was valued at $60,000. The Shakers must have used this figure and let Tillinghast know confidentially that this is what they were hoping to get. They felt that the company would make them an offer by the first Tuesday of May, 1857.[87] This did not happen, but over a year later, in the fall of 1858, the company negotiated a new lease with the Shakers. The rent paid to Nutting and Persons was reduced, but the company agreed to pay for all repairs except if the reservoir dam should be washed away again. Four weeks later, water starting seeping around the flume and continued despite the efforts of Samuel Rodman and Alden Snell to organize repairs. This frustrated them so much that they sent for George Hussey and then left for Lowell intending to "abandon the whole concern" and look for a mill there. Elder Grove remarked to Tillinghast, "I think that they are rather whimisical, don't you? as at the first repair of importance they fail up." The Shakers then called in an inspector who said "it was no trouble to stop the leak" and that Rodman and Snell had not taken the correct steps. This indicated once again Snell's incompetence and Rodman's impatience. At this point Snell had cost the firm $25,000 in losses in the factory and perhaps as much as $20,000 in bad business dealings with yarn suppliers.[88]

Debt by 1861

Conditions worsened and in April 1861 the Ministry of New Lebanon asked the Harvard Ministry for precise information regarding the factory debts. The resulting report was shocking. The overall debt was over $50,000, $30,000 of which was to non-Shakers.[89] Elder William Leonard, a member of the Harvard Ministry, was the one who replied in April 1861 to the authorities at New Lebanon. His accounting to the "Beloved Ministry" was intended as the answer to their questions, "What amount, and to whom, the Shirley family was in debt to the world, when the last loans were made by Believers." He replied that the last loan by Shakers was in 1856, except for one made by Warren H. Sparrow of the South Family, Harvard, in 1860 for $500. Elder William went on to say that he "hunted diligently … and what you find … is as near as I can get to it. But I am of opinion, from appearances that accounts stood nearly so in 1856." He concluded that his details of the debt were "more correct papers and Book, than Jonas Keeps I think."[90] Nutting, when first contracting debts to the world, resolved to keep track of sums owed in his "Book of Accounts" kept in the Office. He also kept a small book and "Memorandum."[91] These were critically examined and the information organized into a coherent whole by Elder William Leonard of Harvard. This information is a serious indictment about the inability of trustee Jonas Nutting to keep accurate accounts and to find the means to settle the debts. If the debt in 1861 was the same as in 1856, nothing had been done to lessen it in five years! The details are a doleful example of "disobedience to the laws of Zion punished by unseen circumstances working adversity [*sic*]".[92]

Elder William gave a precise year by year report.[93]

1856 Income: 9/1 rent: $1,652.35
Expenses: rebuilding the reservoir: $6, 049.27
1856 loss $4,396.92

1857 Income: 3/1 and 9/1 rent: $3,304.70;
Expenses: repair of dam and raceway at factory: $1,650
loss of time and rent while reservoir re-built: $2,080
repair segment of water wheel: $110.
1857 loss: $535.30

In spite of losing $4,932.22, the Shakers, as noted, re-negotiated their lease with the Phoenix Company and their rent payments were reduced! Starting in 1858, for first two payments, allowances on the lease would reduce the rent from the company each time by $500. After that, the reduction would be $200 a year.

1858 Income: Rent: $3,304.70.
Expenses: Repair of dam at mill: $550
allowance on lease: $500
iron and labor repair at factory: $19.35
Sidney Benjamin, raising road at reservoir: $390
1858 profit: $1,880.35

1859 Income: Rent: $3,304.70
Expenses: allowance on lease: $500
Cyrus Goodridge, damage by flowing: $106
claims yet demanded and must be met with the lessees for repairs of dam and rental of mill: $1,931.24
allowance on lease: $100
1859 profit: $667.46

1860 Income: Rent: $3,304.70
Expenses: allowance on lease: $200
C Davis, land part flowed: $380
clearing race at mill: $195.41
Sherman Willard, flowing land: $140
1860 profit: $2,389.29

1861 Income: 3/1 rent $1652.35
Expenses: allowance on lease: $100
pay N. Wood, attorney for Goodridge: $262.50
work on reservoir dam: $35.37
diking brook at factory: $8.88
1861 profit: $1,245.60

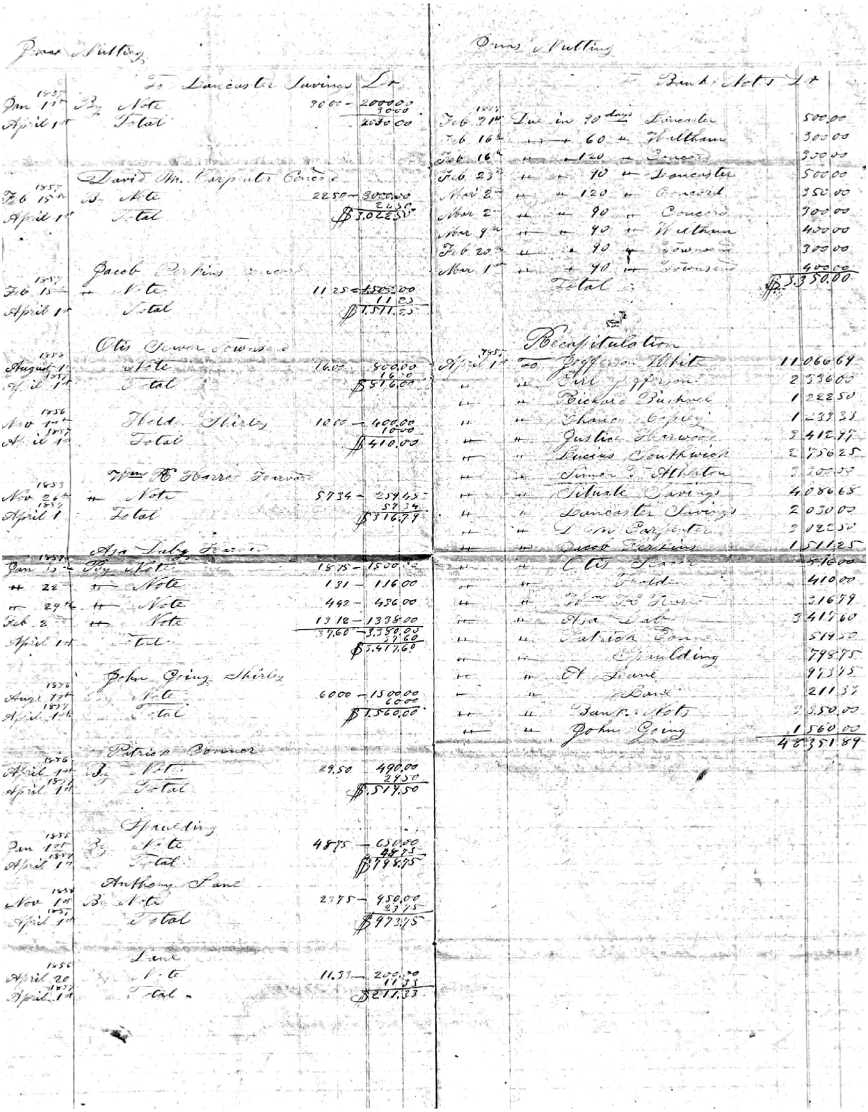
In summary, when losses are subtracted from income, the balance is a profit of just $1,250.48 in five and a half years. This profit of only $227.36 a year, prompted Elder William to label the whole factory venture "a costly experiment."

As steep as the amount of money on loan from Shakers was, the debts to the world were far higher. This was a very serious situation. In the long run, if the Shirley Shakers never paid back a penny to other Shakers it would create extremely hard feelings, but no results with legal consequences would likely occur. In contrast, debts to outsiders had to be paid on a timely basis, or else. For example, trustees Jonas Nutting and Leander Persons on May 20, 1852, took out a promissory note in the form of a mortgage for $4,000 from South Scituate Savings Bank. They used the factory, the buildings, the five-acre property, and the water privilege as collateral. The term of the note was for five years with interest payments of $105 due semi-annually at the Bunker Hill Bank in Charlestown, Massachusetts. If the Shakers defaulted on either the principal or the interest, after two months the treasurer of the bank could lawfully "enter into and upon … the premises … to sell and dispose of the same … at public auction; first giving notice of the time and place of sale, by posting up notifications thereof, six months at least before the sale, in two public places in the town … and by publishing the same three weeks successively in any newspaper printed in the county where the land lies."[94] Clearly, every penny the Shakers managed to get hold of had to be put toward debts of this type.

By 1858, the trustees at Shirley owed non-Shakers a staggering $32,648. This included at least $11,000 owed to banks and twenty-two individuals. In April 1861, the indebtedness to the World had decreased slightly to $29,554.14 and in September 1862 it was $28,108.65. By April 1864, it had increased to $29,261.65, a mere $292.49 less than in 1861—not even a 1 percent decline in three years. The reason for the small decline was due to the interest being kept down by small infusions of cash from income derived from two lumbers mills, the income from the lumber business and from their "domestic manufacture."[95] Still, interest on the money owed during this three years period amounted to 6 percent, or $5,319.74. Even if all the $9,314.10 rent from the factory could be applied to the debt, subtracting the interest would make only $3,994.74 available to go toward debts. Since expenses still mounted, almost none of the factory rent could be used to pay what was owed. The examples below from the years 1861–1864, show why it was impossible to make any headway on the loans.[96]

Between April 1861 and September 1862, interest owed was $2,529.77, and $500 additional dollars were paid out to people whose land was flowed by the water from the reservoir. Another $500 was spent on repairs to the raceway. Between September 1862 and April 1864, $500 was required to repair the road and build a new bridge at the head of the reservoir. Insurance for the factory during this time was $120, and the lawsuit with the Fitchburg Rail Road was finally settled for $2,080.[97] Attorney fees were $283. When all these expenses were subtracted from the available $3,994.74 in rent, the balance was $261.36.[98] This caused the New Lebanon Ministry in 1864 to lament: "It appears there has been no debts paid this past three years" on the Shirley factory.[99] If, as Elder William suggested, the debts of 1856 were the same as in 1861, then actually it was eight years with no reduction of the debt. In summary: "This is all bad. It was a <u>bad</u>, <u>bad</u> enterprise, a bad hour when they planned it; a bad foundation to build upon; they fell upon a bad man to manage the mill; he has made it bad for us and for the company."[100]

Jonas Nutting felt "harassed, perplexed, embarrassed and discouraged." Moreover, "he has positively been ashamed" to even speak of the matter and thus "stays in gloomy silence & sorrow" and "does nothing." Adding to his woes, in 1861, the man who sold applesauce for him on commission, suddenly died in Boston. He owed the Shakers $500 and his estate was good for it, but it took a year to settle at the time when the Shakers needed every dime they could raise.[101] Since the books were examined in 1861,



[illegible] Nutting

To Lancaster Savings Dr

1857 Jan 1st	By Note	3000	2000.00	
			30.00	
April 1st	Total		2030.00	

David M. Carpenter Concord

1857 Feb 15th	By Note	22.50	3000.00	
			22.50	
April 1st	Total		$3.022.50	

Jacob Perkins Concord

1857 Feb 15	" Note	11.25	1500.00	
			11.25	
April 1st	Total		$1.511.25	

Otis [illegible] Townsend

1856 August 1st	Note	16.00	500.00	
			16.00	
1857 April 1st	Total		$516.00	
1856 Nov 1st	Holden Shirley	10.00	400.00	
			10.00	
1857 April 1st	Total		$410.00	

Wm [illegible] Harris Harvard

1853 Nov 26th	" Note	57.34	259.45	
			57.34	
1857 April 1	Total		$316.79	

Asa [illegible] Harvard

1857 Jan 1st	By Note	18.75	1500.00	
" 22	" Note	1.31	116.00	
" 29th	" Note	4.42	436.00	
Feb 2	" Note	13.12	1338.00	
		37.60	3.380.00	
			37.60	
April 1st	Total		$3.417.60	

John Going Shirley

1856 Aug 1st	By Note	60.00	1500.00	
			60.00	
1857 April 1st	Total		$1.560.00	

Patrick Conner

1856 April 1st	By Note	29.50	490.00	
			29.50	
1857 April 1st	Total		$519.50	

Spaulding

1856 Jan 1st	By Note	48.75	650.00	
			48.75	
1857 April 1st	Total		$798.75	

Anthony Lane

1856 Nov 1st	By Note	23.75	950.00	
			23.75	
1857 April 1st	Total		$973.75	

Lane

1856 April 20	By Note	11.33	200.00	
			11.33	
1857 April 1st	Total		$211.33	

[illegible] Nutting

To Bank Notes Dr

1857 Feb 9th	Due in 90 days	Lancaster	500.00
Feb 16th	" " 60 "	Waltham	300.00
Feb 16th	" " 120 "	Concord	300.00
Feb 23rd	" " 90 "	Lancaster	500.00
Mar 2nd	" " 120 "	Concord	350.00
Mar 2nd	" " 90 "	Concord	300.00
Mar 9th	" " 90 "	Waltham	400.00
Feb 20th	" " 90 "	Townsend	300.00
Mar 1st	" " 90 "	Townsend	400.00
	Total		$3.350.00

Recapitulation

1857 April 1st	To	Jefferson White	11 066.69
"	"	[illegible] Jefferson	2 336.00
"	"	Richard Bushnell	1 222.50
"	"	[illegible] Copley	1 233.33
"	"	Justice [illegible]	3 412.77
"	"	Lucius Southwick	2 756.25
"	"	[illegible] Atherton	3 300.00
"	"	Situate Savings	4 086.68
"	"	Lancaster Savings	2 030.00
"	"	D M Carpenter	3 022.50
"	"	Jacob Perkins	1 511.25
"	"	Otis [illegible]	516.00
"	"	Holden	410.00
"	"	Wm [illegible]	316.79
"	"	Asa [illegible]	3 417.60
"	"	Patrick Conner	519.50
"	"	Spaulding	798.75
"	"	A Lane	973.75
"	"	Lane	211.33
"	"	Bank Notes	3 350.00
"	"	John Going	1 560.00
			48 351.89

Fig. 9. *Account of factory debts.*
Communal Societies Collection, Hamilton College

Nutting was required to give a yearly account to the Ministry at Mount Lebanon. This he never did. As the years went by, the Harvard Ministry became more suspicious of Nutting's honesty since they felt he had not fully disclosed financial matters. For example, he did not list any income from the two saw mills, the sale of many cattle each year, and income from pasturing stock from neighbors. Instead, he claimed income only from what they manufactured such as brooms and mops. This gave the false impression that the family "could not get a living."[102]

Sale of the Factory

The Civil War had caused a serious disruption in obtaining enough cotton for the factory. This decreased the value the complex, and the Ministry felt that when the war was over, the mill would be worth twice as much than it was in 1864.[103] This may explain the delay in finding a buyer. Investors would have been very reluctant to purchase a textile factory that lacked enough cotton. At the same time, the Harvard Ministry, preoccupied with serious troubles of its own, may have thought it best to wait for conditions to improve so that they could get a higher price. Indeed, just five months after the war was over, the Ministry from Mount Lebanon visited Shirley on September 20, 1865. The next day they accompanied the Harvard Ministry to the factory reservoir. They estimated that it held over one thousand acre-feet of water.[104] Although specific details of the visit have not survived, plans for the sale of the factory must have pre-occupied them because by the spring the Harvard Ministry was negotiating with the owners of the Phoenix Company who had expressed interest in buying the place from the Shakers. This may seem surprising since for over a dozen years, the company had tried to squeeze as much as they could from the Shirley trustees, often demanding internal and external changes that cost thousands of dollars. It would appear, however, with the supply of cotton assured, that the factory was not in such poor shape after all, and that the Phoenix Company wanted it.

True to form, the Shakers faced inflexible bargainers as proceedings developed. On April 5, 1866, the Ministry decided that they would ask $46,000 for the premises. On Wednesday, May 2, Rodman and Snell visited the Ministry in the evening at Shirley and said they would not pay more than $40,000. It seems it was a brief meeting, and they left, unwilling to budge on their offer. The Ministry, the elders of Shirley, and Jonas Nutting met on May 11 and agreed to sell for $40,000 if they could not get more. This prompted the Ministry to seek out other parties. On May 16, Elder Grove went to nearby Clinton, Massachusetts, to see Franklin Forbes (1811–1877), agent for the Lancaster Mills. Forbes was in Boston so they did not meet. The next day, Elder Grove and Brother Jonas met with Levi Holbrook (1815–1884), an owner of the Fredonian Mill. Holbrook agreed to write to his partner in Worcester about buying the factory. Nothing came of this, and the Shakers held out until July 2, 1866, when they agreed to sell to the Phoenix Company for $40,000.[105] The sale went through by the first week of October 1866. On October 19, the *Massachusetts Spy* (Worcester) reprinted an item originally published in the *Clinton Courant* (Massachusetts). The article stated that the Shakers had sold their "mill, a three story boarding house, the superintendent's establishment, five large tenement houses, stores, etc." to Rodman, Hersey [Hussey] and Company of New Bedford. The article incorrectly reported that the Shakers received between $50,000 and $60,000 for everything. Alden G. Snell, "part owner of the machinery, and superintendent of the mill from the commencement will remain."[106]

With the proceeds from the sale, the Shirley Shakers were finally able to pay off their debts. On October 8, 1866, Elder Grove went to Shirley by request of the elders there and Brother Jonas. They sought his counsel regarding the payment of what they owed. The next day he looked over the accounts of how much had been borrowed to sustain the factory and tried to determine how much was borrowed from Believers.[107] On October 17, 1866, Elder Grove Blanchard of the Harvard Ministry came to New Lebanon on business "to pay back the principal of the money lent to Shirley for the factory enterprise." He was accompanied by Canterbury trustees Jason Kidder and David Parker.[108] They also went to Groveland where Blanchard paid back the $2,500 owed to Elder Peter Long of the East Family.[109] At Watervliet, between October 23 and 25, Elder Grove settled the debts owed to the Church and Second Families and negotiated to obtain a donation to Shirley out of what was owed. The creditors at Watervliet agreed to donate $500 from what was their due.[110] On October 26, Elder Grove paid back the money owed to the North Family, Mount Lebanon. He then went to Hancock before traveling to Enfield, Connecticut, to settle accounts there on October 27 and 29. Note that it was Elder Grove Blanchard and not trustee Jonas Nutting who went to the various communities to pay back the money that had been loaned. Blanchard was a very well-liked elder, and by this time, Jonas Nutting must have been somewhat despised. It seems that only the borrowed principle was paid back, not the thousands owed in interest. If Shaker leaders hoped to "get a break" or seek to avoid uncharitable remarks about loans that were outstanding for going on twenty years, Blanchard and not Nutting was the logical choice for the task for repayment of loans. After this, the Lebanon ministerial journal never mentions the Shirley debt again. Their focus soon shifted to the Shakers of New Gloucester (Sabbathday Lake), Maine. By the end of March 1867, that society was in debt $9,000 to the World by dishonest business dealing of trustee named Charles Vining, who eventually went to state prison because of his malfeasance. As they did for the Shirley Shakers, the Lebanon Ministry attempted to set up a system of donations from the various Shaker communities so that $7,000 could be raised to avoid any borrowing from the World. The Harvard and Shirley communities were assessed $1,000. Apparently, the Ministry felt that they were recovered enough to help.[111]

In the meantime, between November 2 and 15, 1866, Elder Grove paid back the money owed to the Harvard Shakers. This closed out the debt owed to the Shakers.[112] No information survives about the schedule of payment of the money borrowed from the World, but it may be assumed that after 1864, rent payments from the factory helped lessen that debt and the residue of what was still owed came from the reminder of the proceeds from the sale.

Epilogue

Much of the blame for the troubles at Shirley has rightly been blamed on Shaker trustee Jonas Nutting, and Alden Snell, agent for the Phoenix Company and superintendent of the factory. One other person, however, should also be held responsible: Samuel Rodman. His mill in New Bedford was a failure. When the many shortcomings of Snell were pointed out to him, he did not act. Instead, he was content to pressure the inexperienced Shakers to provide money for anything he thought should be repaired or redone. His inflexibility and greed were not rewarded, however. The factory cost him, as noted, at least $35,000 and possibly $45,000 due to the incompetence of Snell. Moreover, after the company bought out the Shakers, they may have fared no better. Rodman died in 1876 and ownership passed to Horatio Hathaway (1831–1898) of New Bedford. Hathaway was Rodman's son-in-law, married to his daughter Ellen Rodman (1833–1924). Hathaway did not own the mill for long, however.

In 1881, it was sold to C. W. and J. E. Smith, the owners of the nearby Fredonian Mill.[113] The new owners spent $30,000 on new equipment, but stopped production around 1884. When they sold it in 1886, they received just $20,000.[114] Over the decades, the various owners of the Fredonian Mill—Israel Longley, Willard Worcester, and Levi Holbrook—had developed close business relationship with the Shakers and their factory. It is ironic that after the Samson Cordage Works moved into the former Phoenix Mill in 1888, the Fredonian Mill eventually was incorporated into the complex as its power plant.

When the Shirley Shakers first conceived the idea of building a cotton factory, their economic fortunes were at a high point. In addition, they were receiving several applicants for membership from individuals and families who had worked in textile mills. This influx allowed them to re-open their South Family in 1849. That family, with its magnificent brick dwelling, had closed in 1842. If the cotton factory could bring in large amounts of cash, this would help launch a new time of prosperity for the society. The spiritual power of the Era of Mother's Work was also lingering and this provided much reassurance. As mid-century approached, the Shakers had every reason to foresee a bright future for their community.

By the time the factory was sold in 1866, the Shirley Shakers were in steep decline. Only John and Mary Ann Whitely would ultimately remain from the influx of 1849. Death and defections had thinned the ranks and no replacement members could be found. For example, only two of the twenty youth under twenty-one years of age in 1850 would die as Shakers. After the 1860s, even by Shaker standards, Shirley became a very small society. Industries such a mop making, broom making, and applesauce brought in enough income, however, so that the village remained solvent. In addition, they had a productive farm, even though they had to hire outsiders to do much of the work. They also owned a good deal of surplus of land which could be rented out to pay unresolved debts. Stephen J. Stein in *The Shaker Experience in America* claims that the Shirley Shakers never fully recovered from the repayment of the factory debt and its repercussions.[115] This conclusion is too simplistic and fails to consider the other factors that contributed to the continued disintegration of Shaker life at Shirley. Even had the factory been a big success, this would not have changed the fact that the community was getting smaller and aging. Those living at Shirley Shaker village after 1866 would not have felt much of a shadow from the debt. Their biggest concern would have been that very few young women and no young men were choosing to remain there after reaching maturity, and the suitable adults who came to try the life were not staying. This situation only worsened, but available resources were enough to see the Believers through the final forty years before the property was sold. Fewer people meant diminished income, but it also meant that the score or two of adult Shakers could easily live on a place that once supported over a hundred people. When the remaining Shakers needed money, they simply sold land. With a mere handful able to work, the society often lacked ready cash, but this had nothing to do with the great debts from the factory. Those obligations had been cleared by the end of 1866, and the small industries did supply basic needs until the handful that remained by the early twentieth century realized that consolidation with the nearby Harvard Shakers was the only option. Certainly, the factory affair was a horrible business, but as the years went by, its seriousness faded as the community faced the larger issues causing its demise.

Notes

1. Seth Chandler, *History of the Town of Shirley, Massachusetts* (Shirley: Published by the Author, 1883), 41-42, 47-49.
2. He was thrown from a carriage and broke his neck.
3. Worcester County Registry of Deeds, Book 348, p. 446, OClWHi I:A-14, item 41.
4. Almira Larkin White, *Genealogy of the Descendants of John White of Wenham and Lancaster, Massachusetts* (Haverhill: Chase Brothers, 1900), 1:561-62.
5. Worcester County Registry of Deeds, Worcester, Massachusetts, Book 348, pp. 203, 446 .
6. *Connecticut Courant* (Hartford), June 12, 1852, [3]. Courtesy GenealogyBank. www.genealogybank.com/doc/newspapers/image.
7. OClWHi I:A-14, item 42.
8. "Articles of Agreement made concluded and agreed upon this Ninth day of february, A.D. 1850," Communal Societies Collection, Hamilton College.
9. westegg.com/inflation/infl.cgi.
10. Chandler, *History of the Town of Shirley, Massachusetts,* 50-51. The cloth made at the mill in 1853 was in imitation of "Utica sheeting" and sold in Boston. William Almy of that city was likely an agent for sales there. Zephaniah W. Pease, ed., *The Diary of Samuel Rodman 1821–1859* (New Bedford: Reynolds Printing Company, 1927) March 7, 1853.
11. Chandler, *History of the Town of Shirley, Massachusetts,* 696-98. This is Chandler's "Appendix D," mostly a long quote from the article in the *Daily Evening Standard* of New Bedford.
12. "Present Debts owed by Jonas Nutting to Believers made out for the Lebanon Ministry April, 1861 by William Leonard," OClWHi II:A-11, and "Account of Factory Debts," April 1, 1857, II A Shirley, Mass., Communal Societies Collection, Hamilton College.
13. westegg.com/inflation/infl.cgi.
14. This may be an approximation of money lent and broom corn and seed sold to Shirley in 1851 and 1852.
15. To Joseph S. Tillinghast from Grove B. Blanchard, September 29, 1851, OClWHi IV:A-59.
16. OClWHi II:A-11.
17. Over fifty years ago, Brother Ted Johnson of the Sabbathday Lake Shakers wrote that the Millennial Laws of 1845 were not taken seriously and they were quickly revised into the more sensible Rules and Orders of 1860. Unfortunately, the peculiar 1845 laws are often quoted to depict Shaker life at that time.
18. Edward Deming Andrews, *The People Called Shakers* (New York: Oxford University Press, 1953), 257.
19. "Definition of phoenix." Oxford University Press. Lexico.com July 24, 2022.

http//www.lexico.com/definition/phoenix.

20. Sandra A. Soule, *Robert White Jr.: "Spreading the Light of the Gospel"* (Clinton, N.Y.: Richard W. Couper Press, 2009), 2-3.
21. Various references to Joseph S. Tillinghast's connections to Robert White, Jr. may be found in Sandra A. Soule, *Seeking Robert White: Quaker, Shaker, Husband, Father* (Clinton, N.Y.: Richard W. Couper Press, 2016), 93, 106, 219, 253, 285, 309, 324, 327, 334, 382n4, 385n46.
22. William Leonard to Harvard Ministry, January 16, 1849, OClWHi IV:A-24.
23. Harvard Ministry to Hancock Ministry, January 5, 1849. Joseph S. Tillinghast to Grove Blanchard, March 12, 1849. OClWHi IV:A-24.
24. The Rodman and Rotch families had been very involved in the whaling industry. In fact, it was a Rotch who suggested the change in name of the town from Dartmouth to New Bedford. Willian Rodman Rotch was Samuel Rodman's first cousin. Rodman's father, also named Samuel Rodman, and William Rodman Rotch's mother, Elizabeth Rodman, were siblings.
25. Henry H. Crapo, "The Story of Cotton and Its Manufacture into Cloth in New Bedford," [New Bedford, Mass.]: [Old Dartmouth Historical Society], 1937, p. [14], and Edgar F. Taber, Jr., "Condensed Data" relating to New Bedford Cotton Mills p. [24]. Both these items are printed in a booklet of about fifty pages. Allen County Public Library Genealogy Center, Fort Wayne, Ind., courtesy of Internet Archive. http//archive/details/storyofcottonits00crap.
26. To Joseph S. Tillinghast from Grove Blanchard, January 20, 1852, OClWHi IV:A-59. Dennis Pratt had known about the New Bedford Steam Mill Company since at least 1850. On October 2 of that year, he visited Samuel Rodman with three sisters, including an eldress, from Shirley. One of the young women, now a Shaker, had worked at the New Bedford mill and had taken between fifteen and twenty yards of cloth. The Shaker eldress compelled her to confess this to Rodman who "treated her kindly" and forgave the misdeed. *Diary of Samuel Rodman 1821–1859.*
27. To Grove Blanchard from Joseph S. Tillinghast, January 22, 1852, OClWHi IV:A-25.
28. Joseph Tillinghast's and Pardon Tillinghast had the same great-grandfather, Phillip Tillinghast. Regarding Pardon's directorship of Wamsutta Mills see, Edger F. Taber, *Condensed Data Relating to New Bedford Cotton Mills* (Old Dartmouth Historical Society: New Bedford, Mass., 1937), [24].
29. Crapo, "The Story of Cotton and Its Manufacture into Cloth in New Bedford."
30. To Grove Blanchard from Joseph S. Tillinghast, January 23, 1852, OClWHi IV:A-25.
31. To Grove Blanchard from Joseph S. Tillinghast, March 1, 1852, OClWHi IV:A-26.

32. OClWHi I:A-14, item 44.
33. *Diary of Samuel Rodman 1821–1859* , November 16, 1852.
34. To Grove Blanchard from Joseph S. Tillinghast, March 2, 1853, OClWHi IV:A-26.
35. To Grove Blanchard from Joseph S. Tillinghast, March 5, 1853. OClWHi IV:A-26.
36. To Joseph S. Tillinghast from Grove Blanchard, March 10, 1853, OClWHi IV:A-26.
37. Chandler, *History of the Town of Shirley, Massachusetts,* 42.
38. Probate Records 1648–1924 (Middlesex County, Massachusetts), Probate Paper Number 38692-38761. Ancestry.com, Massachusetts, U.S., Wills and Probate Records 1635–1991, [database on-line]. Lehi, UT, USA: Ancestry Operations, Inc., 2015.
39. To Joseph S. Tillinghast from Grove Blanchard, March 10, 1853, OClWHi IV:A-26.
40. To Grove Blanchard from Joseph S. Tillinghast, March 12, 1853, OClWHi IV:A-26.
41. A regulator device controlled the amount of water that flowed onto the water wheel.
42. To Grove Blanchard from Joseph S. Tillinghast, March 10, 1853. OClWHi IV:A-26.
43. Ibid.
44. "A Journal or Register of Passing Events," 1850-1859, Shaker Manuscript Collection, New York Public Library, 25 and 27, March 9 and April 28, 1853.
45. To Grove Blanchard from Caleb M. Dyer, April 28, 1853, OClWHi IV:A-26.
46. To the Ministry of New Lebanon from the Harvard Ministry, May 2 and May 20, 1853, OClWHi IV:A-26.
47. Ultimately Page avoided having his case tried. It seems that Snell spoke imprudently and made his case known and thus spoiling it. Abbott, Snell's lawyer thought him "a fool" and refused to take the case any further. April 4, 1855, OClWHi IV:A-59.
48. Ibid., July 27, 1853.
49. Ibid., May 2, 1853.
50. OClWHi II:A-11 and Special Collections, Hamilton College, II:A Shirley MA.
51. Ibid.
52. westegg.com/inflation/infl.cgi All the modern equivalent figures in this paragraph are from this source.
53. To Grove Blanchard from Joseph S. Tillinghast, April 4, 1855, OClWHi IV:A-27.
54. To Grove Blanchard from Joseph S. Tillinghast, October 30, 1855. OClWHi

IV:A-27.
55. To Grove Blanchard from Joseph S. Tillinghast, June 6, 1857, OClWHi IV:A-27.
56. "Report, ca. 1850 prepared by J. Chase for Snell and Jonas Nutting," (A report on the speed and function of the Shaker Mill at Shirley), Hamilton College Library Special Collections, Shaker Manuscripts, II Financial, Legal, and Land Records, Shirley Mass.
57. A breast shot water wheel is one where water enters about half-way up and pushes the wheel forward as it falls and as it flows under the wheel. The breast or apron is a curved construction which closely conforms to the face of the wheel. Its purpose is to keep the water in the buckets.
58. "Report by J. Chase," Hamilton College Library Special Collections.
59. Worcester County Registry of Deeds, Worcester, Massachusetts, Book 491, 248 and "Agreement between Samuel Hazen of Shirley and Jonas Nutting and Leander Persons," Hamilton College Special Collections, Shaker Manuscripts, II Financial, Legal, and Land Records, Shirley Mass.
60. Estimates vary about the amount of water that the reservoir could hold. The Shirley Historical Society says 820 acres.
61. "Agreement between Samuel Hazen and Jonas Nutting and Leander Persons," Hamilton College Special Collections.
62. Ibid.
63. "Our History," Phoenix Park, a Lexvest Property, https://phoenixparkonline.com/history/.
64. Chandler, *History of the Town of Shirley, Massachusetts,* 52-53. This estimate of damages was made thirty years after the event and seems much too high.
65. 750 acre-feet of water is 244,388,736.29 gallons of water! Courtesy Convert Live, convertlive.com/u/convert/acre-feet/to/gallons-us-liquid#750.
66. "Inundation at Shirley," *Lowell Daily Citizen and News*, 3 July, 1856, [2]. Courtesy GenealogyBank. www.genealogybank.com/doc/newspapers/image.
67. This mill dated from 1850 and established on the Catacunemaug River. The proprietors were Pope and Parsons and they employed between eight and ten workers. They made farmers' tools, especially hay and manure forks. The annual output was about six thousand implements made of wrought steel, and they were considered "of excellent finish and character." Chandler, *History of the Town of Shirley, Massachusetts,* 57-58.
68. *Boston Cultivator*, July 12, 1856, 6. Courtesy GenealogyBank. www.genealogybank.com/doc/newspapers/image.
69. *Diary of Samuel Rodman 1821–1859*, July 7-20, 1856.
70. Chandler, *History of the Town of Shirley, Massachusetts,* 53.
71. If the dam was stone and gravel as indicated by the newspaper account, unless the foundation was large and thick, serious seepage would have

occurred. The "flow and seepage through the foundation and abutments needs to be controlled so that no internal erosion occurs and there is no sloughing [collapse or slide into a hole] in the areas where seepage emerges." If the thickness of the foundation of the dam was three feet or less it "lacks the density needed for impermeability" and "is ineffective … in preventing seepage." Moreover, if the foundation is over three feet but less in size than the head of the reservoir, drainage trenches or pressure wells have to be constructed near the downstream toe of the dam "to relieve uplift pressure." Haseeb Jamal, "Sand and Gravel Foundations for Dams," *About Civil Engineering*, April 26, 2017. www.aboutcivil.org/sand-gravel-foundationsdesigns-for-dams-html.

72. "Meeting of the Phoenix Cotton Manufactory Company in New Bedford," March 12, 1856, OClWHi IV:A-59.
73. OClWHi II:A-11.
74. "Meeting of the Phoenix Cotton Manufactory Company in New Bedford," March 12, 1856.
75. "A Journal or Register of Passing Events," 1850–1859, Shaker Manuscript Collection, New York Public Library, January 15, 1857.
76. The Church Family, New Lebanon gave $400; the Maine Shakers gave $300; the New Hampshire Shakers gave $170 and the Harvard Shakers gave $75. Note that Watervliet and Enfield gave nothing; the two societies were still owed $15,200.
77. OClWHi IV:A-6. May 17, 1853 and November 1, 1854.
78. "Account of Factory Debts," Special Collections, Hamilton College, II:A Shirley, Mass.
79. www.measuringworth.com.
80. "A Journal or Register of Passing Events," August 4, 1857.
81. Ibid. November 11, 1856.
82. OClWHi IV:A-14, November 26, 1856.
83. "A Journal or Register of Passing Events," November 14, 1856.
84. The North Family debts were in connection to the construction of a large and unneeded dwelling house. "A Register of Incidents and Events … kept by Giles B. Avery," October 14, 1863.
85. To Joseph S. Tillinghast from Grove Blanchard, June 24, 1857, OClWHi IV:A-59.
86. To Jonas Nutting from Euclid Chadsey, March 28, 1857, OClWHi IV:A-59.
87. To Joseph S. Tillinghast from Grove Blanchard, April 18, 1857, OClWHi IV:A-27.
88. To Joseph S. Tillinghast from Grove Blanchard, September 5, 1859, OClWHi IV:A-27.
89. "A Register of Incidents and Events … kept by Giles B. Avery," 1859-1874, Shaker Manuscript Collection, New York Public Library, April 8, 1861 and

April 13, 1861.
90. OClWHi II:A-11.
91. To Ministry of New Lebanon from the Harvard Ministry, April 5, 1861, OClWHi IV:A-28.
92. "A Journal or Register of Passing Events," April 13, 1857.
93. OClWHi II:A-11.
94. Middlesex County Registry of Deeds, Cambridge, Massachusetts, Deed Book 632, p. 249.
95. OClWHi IV:A-28, April 5, 1861.
96. OClWHi II:A-11.
97. The original amount of the lawsuit was $12,000. A stone mason reported, however, that the rail road bridge had been about to be replaced due to its weakness. In fact, it had been shored up with wooden studs. The studding had also interfered with the passage of the flood waters and the studs floated away causing the bridge to collapse. The trustees were reluctant to pay even $2,080, and wanted the matter put before arbitrators. This action failed and it seemed that the matter would go to trial. The Shaker figured that it would cost them at least $1,500 to go to court so they accepted the settlement. The Shakers did not have the money and the rail road agreed to let them have a year to pay at 4 percent interest. To the Ministry of Mount Lebanon from the Harvard Ministry, February 10, 1864, OClWHi IV-59.
98. Ibid.
99. "A Register of Incidents and Events … kept by Giles B. Avery." February 16, 1864.
100. OClWHi IV:A-28, April 5, 1861.
101. Ibid.
102.OClWHi IV:A-59, February 10, 1864,.
103. Ibid.
104. "A Register of Incidents and Events, September 20-21, 1865.
105. Ministry Journal of Grove Blanchard, April 5, May 2, May 11, May 16-17, July 2, 1866, [Trustees.ARC.HVD 3 3127].
106. *Massachusetts Spy* (Worcester), October 19, 1866, [1]. Courtesy GenealogyBank. www.genealogybank.com/doc/newspapers/image.
107. "Ministry Journal of Elder Grove Blanchard," October 8-9, 1866.
108. "A Register of Incidents and Events," October 17, 1866.
109. "Ministry Journal of Elder Grove Blanchard," October 19, 1866.
110. "A Register of Incidents and Events," October 22, 25, 1866.
111. Ibid., March 13, 17, 1867.
112. Ibid., November 5, 15, 1866.
113. Chandler, *History of the Town of Shirley, Massachusetts,* 52.
114. To Brother Alonzo Hollister from Elder John Whiteley, November 15, 1886, OClWHi IV A-28.

115. Stein also claims that William Leonard was put into the Harvard Ministry to deal with the financial crisis at Shirley. This is perhaps an inference on his part because it is not evident in the ministerial correspondence. Stephen J. Stein, *The Shaker Experience in America* (New Haven: Yale University Press, 1992), 144-45, 253.