

THE SPENCER COOPER POWDER MILL

by

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In the early nineteenth century Lexington, Kentucky was one of the centers of a state-wide mining and manufacturing industry that supplied gunpowder, an item vital for an expanding young country. The thriving community lay in the heart of a cave-rich region from which ample supplies of nitrous soil, easily refined to potassium nitrate or saltpetre as it was called, could be obtained. While in a few cases the saltpetre was processed into gunpowder at factories near the caves, the greater part of this natural, renewable resource was sent in wagonloads to Lexington and either processed there or shipped to eastern manufacturers. The acquisition of large quantities of powder was critical to the fledgling nation during the 1812 War. The gunpowder industry embarked upon boom times with dozens of powder-makers entering business and entrepreneurs scouting caves for saltpetre potential. At war's end the demand for powder dropped sharply and many of these businesses failed. A hardy few remained and continued to make powder for local and regional use, though forced to import nearly all of the ingredients as saltpeter was no longer mined in quantity in Kentucky.

One of the more successful powder makers of Lexington was the Reverend Spencer Cooper. Although he did not enter this manufacture until long after the end of the 1812 War, he built a large and well-known company that was halted only by his untimely death following a devastating bout with Asiatic Cholera.

Spencer Cooper was born in Virginia in 1787, and after spending his youth in Cincinnati, Ohio, came to Lexington in 1808 and was married a year later. In 1811, Cooper and his wife, the former Mary H. Burton, attended a Methodist camp meeting held in nearby Woodford County; he was there so inspired by a sermon that he became a convert and joined the church. Soon noted for his enthusiasm, in 1816 he was licensed to preach and was thereafter known as the Reverend Cooper.¹

In January of 1818 Spencer Cooper purchased a four-acre tract of land along the Town Branch, about a mile west of the Lexington settlement and near the historic McConnell's Spring. Within a few weeks Cooper had entered into business with Joseph Boswell, to manufacture and sell gunpowder. The announcement dated February 11 and printed in the Lexington newspaper stated that Boswell, along with his nephew George, as the Hope Powder Mills were now in co-partnership with Cooper and the firm would henceforth be known as Spencer Cooper & Co. In the same issue was also printed a notice that Joseph had purchased the mercantile establishment of Morrison, Boswell and Sutton on Cheapside in Lexington and formed a partnership with George Boswell to operate the store. This announcement

stated that they would give the "highest price in cash for Salt Petre." and was carried in the *Kentucky Gazette* for slightly over a year; thereafter the firm was never referred to again by the name of Hope Mills.²

The Powder Mill location was a shrewd choice on the part of Reverend Cooper. On the farm just down from his lot on the Woodford Road was the established powder manufactory of Samuel and George Trotter, who had entered business before the 1812 War. The two business concerns had their frontage and main entrances on two separate roads, Cooper located on the Woodford Road (present-day Versailles Road) and Trotter on what was even then called the Old Frankfort Road. Cooper was likely to snare a good portion of the trade as both were equidistant from Lexington on major thoroughfares. It was a good deal for the partners. Cooper apparently received a going concern with a ready outlet for his product at the Boswell's store, which in turn purchased saltpeter for use in the manufacture. Within a short time Spencer Cooper & Co. was producing enough powder to warrant newspaper advertisements by the store keepers of neighboring communities.³

From various sources a fairly detailed picture of the operations of Cooper's powder factory can be built. At the time the du Pont Company of Delaware was the leading powder manufacturer in the country, having prospered greatly during the boom times as end destination of much of the saltpeter procured in Kentucky. Du Pont used the most up-to-date technology available to turn the raw materials into gunpowder. Elsewhere the making of gunpowder proceeded with wide variations of technique and equipment, from primitive to state-of-the-art. In large part this seemed to be dependent upon the scale of the operation. Small quantities could be made by grinding and mixing the ingredients with a single mortar and pestle, running the damp paste through a screen to produce a particular size grain, and then sun-drying the result. Larger operations used more and larger equipment, such as an entire row of mortar/pestles operated by water or animal power, and later millstones were used to prepare the ingredients.

The primary component of gunpowder is potassium nitrate, naturally occurring in the soil and sandstone rocks of many rockshelters. A similar compound, calcium nitrate, may be extracted from the soils of caverns by pouring water through the soil, capturing it and boiling it down to a residue. The calcium nitrate was mixed with wood ashes and the dousing and evaporation repeated to produce potassium nitrate, or saltpeter. This important constituent was formerly procured from hundreds of caves and rockshelters in Kentucky and other cavernous states, but by the time of

Cooper's entry into business was almost entirely imported, generally from India. The other necessary ingredients were sulfur and charcoal.⁴

Although sulfur, or Brimstone, was available in the United States in very limited quantities from hot springs and other sources, by far the sulfur obtained by the powder makers was imported from Sicily, and was purchased in a finished form or refined after importation. Charcoal, on the other hand, was usually produced locally and its making was a skilled and dangerous undertaking. Wood was burnt in covered underground pits and had to be constantly checked and regulated to produce carbon rather than ashes.

It has not been established where Cooper might have learned the powder making trade, but he certainly must have known the inner workings of the business, as only a month separated the purchase of his initial four acres and the announcement that he was ready for business. It seems likely that there may have been some stocks on hand, as the evidence indicates that the Hope Mills either was or recently had been in business at the time of sale. There are, however, no known prior references to a mill near this location save that of Samuel Trotter. Hope Mills, if it actually existed and was not a form of pretentious advertising hype, must have been on a very small scale.

In the 1820 Federal Census of Manufacturers, Spencer Cooper reported that he had on hand 60,000 pounds of saltpeter and 11,000 pounds each of Brimstone and Charcoal. As he states that he "could make much more Powder annually but the [market?] do not deem it advisable..." it seems reasonable to suppose that the reserves on hand did not constitute much more than a year's supply. The ratio of the ingredients being approximately 75% saltpeter / 13% sulfur / 12% charcoal, approximately 80,000 pounds of gunpowder could be made. Note that the desired ratio is almost exactly proportionate to his supplies.⁵

It is likely that his annual production was somewhat less, judging by the value he placed in sales for the year 1820. The various Kentucky powder makers replied to the census question of selling price in two ways, if they answered at all: Either they gave their estimated volume of sales, or they gave the local price per pound of finished gunpowder. In Cooper's case, he gave a sales volume of \$21,000. Based on other powder operations listed in the census, the going rate for gunpowder in Lexington at the time was 45 cents per pound, somewhat less at manufacturing elsewhere. Using this price, Reverend Cooper sold just under 50,000 pounds of gunpowder in 1820 and this establishes him as a major operation.

In the first quarter of the nineteenth century millstones had not yet been widely applied to the making of powder, and Spencer Cooper like others used a wooden mortar and pestle system for grinding and mixing. At that time his mill had thirty pestles in operation, heavy wooden pieces that were probably operated by horse power as the business was reported as possessing two incline wheels. Other equipment reported on the

census were a graining machine, a glazing machine, and a pulverizing machine. A Drying House was also on the premises.⁶

Spencer Cooper & Co.'s "warranted glazed Gun Powder" was thus made in approximately the following fashion: The raw materials were brought together at the mill, the saltpeter from India, sulfur probably from Sicily, and the charcoal purchased from local burners. Each would be broken down to small particles by the pulverizing machine, then mixed with a little water and ground to paste in a series of camshaft-driven pestles. The next step would be to press the damp mix through the grainer, and then into the glazing machine, simply a large wooden barrel in which the grains were tumbled with a quantity of graphite. The glazing prevented the powder from packing and caking during storage in containers. After this, the powder was destined for the Drying House.

While the powder was turning in the glazing barrel, the Drying House was heated by a stove to a high temperature and then the fire carefully and thoroughly extinguished. The added heat produced made this step far more dangerous but was much faster than sun-drying the product on long tables, an earlier practice of powder makers. The damp powder was spread thinly on trays and placed onto shelves in the preheated structure.⁷

The final procedure was the packaging of the finished gunpowder. Storage in wooden barrels was the usual method, but such barrels had to be carefully constructed to avoid the obvious hazard of leaking powder. Sizes used were: 25-pound, 50-pound, and the standard 100-pound keg. For smaller quantities and for the personal use of local customers, one-fourth to one pound of gunpowder was weighed out on papers which were then folded and sealed. It was also common for customers to bring their own containers to be filled.

Cooper estimated the worth of the establishment with equipment at \$10,000.

The annual operating expenses of the concern may be partially estimated through 1820 census information.

INCOME

Sale of Gunpowder:		
47,000 lbs	@\$0.45/lb	\$21,000

EXPENDITURES

Materials required to make stated quantity of Powder:		
35,250 lbs Saltpeter	@ \$0.18/lb	\$ 6,345
6,110 lbs Brimstone	@ 0.09/lb	550
5,640 lbs Charcoal	@ 0.02/lb	112

Other expenses:

Wages	1,000
Other	<u>2,000</u>

TOTAL Expenses	\$10,007
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This gave Reverend Cooper an annual income of about \$11,000, a very comfortable amount for the era.⁸

The making of gunpowder in all its steps was a dangerous business, from the grinding at the pestles to the Drying House. Anywhere along the way, a single spark, such as from a stray nail or a bit of chert, could produce a holocaust. For this reason all of the machinery was crafted of wood, including the driving mechanisms. Slaves were used as workers at many powder mills, including Cooper's, to perform the dangerous labors. The usual procedure involved setting a particular piece of machinery in operation and then vacating the premises for the duration, save for occasional visits to inspect the progress or to add water to the mix.

Spencer Cooper's establishment seemed to have more than its share of bad luck in the form of powder explosions. In early May of 1824 the *Kentucky Gazette* reported that on April 30 over one thousand pounds of powder in Cooper's drying house "...blew up, and we regret to state killed one of the laborers and severely wounded two others. Several horses were also killed. The explosion was tremendous; every inhabitant of the town felt it, and every building vibrated, but none were injured by the shock. The immense volume of smoke ascending to the heavens presented a sublime spectacle. We understand that the building was literally blown into atoms." Nine years later, in February of 1833, the establishment was again shaken by an explosion, and again two years later than that. In the latter occurrence, in June of 1835, there was again a fatality in the form of a black slave worker. Reverend Spencer is here quoted as saying that "...he had given positive orders to all the hands employed about his works, never to enter the mortar room without first stopping the pestles, but unfortunately they had not in this case been strictly obeyed."⁹

The series of powder mill explosions very near the town, culminated by the 1839 explosion of stored powder at the inactive Trotter mill that killed a prominent citizen, led to a controversy in the Lexington press. One man wrote to the *Observer-Reporter* and complained that large amounts of gunpowder were stored in the wholesale mercantile houses of the community and this posed a great danger to the inhabitants. This touched off a whole host of replies and accusations; among them a representative of the Lexington firefighting force stated that they had no intention of fighting any blaze in an establishment known to contain such quantities of powder. He can hardly be blamed for his attitude.¹⁰

Despite the explosions, Spencer Cooper continued to prosper. In 1830 he bought a 28-acre tract along the Woodford Road that gave him considerable frontage and in 1832 he purchased 45 acres of land that directly abutted the farm and mill of Samuel Trotter. The Boswells sunk capital into the business by helping finance many of these acquisitions, holding them jointly with Cooper, but by 1832 Cooper was able to buy out their interest in the properties. Twenty years after his purchase of the first four-acre tract, he had accumulated 280 acres and married off a daughter.¹¹

In 1833 the town of Lexington was visited by a severe cholera epidemic that devastated the community; hundreds died, hundreds fled. Reminiscent of the Great Plagues of Europe, carts made the rounds of the streets, accompanied by the cry of "Bring out your dead!" Bodies were buried in mass graves; scarcely a household was unaffected. Reverend Cooper "...visited the sick, knelt by the bedside of the dying, and offered the consolations of the cross to the suffering and bereaved. With a seeming indifference to his own safety, he walked amid the pestilence, and, as an angel of mercy, offered the only balm to the sick and the dying, and only ceased his labor of love when he was stricken by the fearful disease..." His chief competitor, Samuel Trotter, was carried off by the cholera and the rival mill ceased operation.¹²

Cooper never fully recovered from the effects of the near-fatal bout with cholera, and in March of 1838 suffered a debilitating stroke. Over succeeding months his health further declined and in December he suffered a second attack. Two months later, on February 8, 1839, the Reverend Spencer Cooper was dead.¹³

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