



Geographic Integration of Industry on the Wynants Kill, 1816-1911

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The small Wynants Kill is known in the history of waterpower for *Merritt vs. Brinkerhoff* in 1820 and for the Burden water wheel, largest in the world in 1851, events that bracket the first, intense, period of industrialization on the stream (a “portrait” of the climax period is derived from data in the 1855 census of New York State). In addition to the mill sites’ connection by geography and their feudal tenure, a cooperative association formed by the lessees of the water privileges in 1829, industrial arrangements, and community development also connected them vertically. Postal indices, generated from the Official Registers (an under-appreciated business data source) provide the measure and timing of this initial industrialization and the subsequent rejuvenations of livelihood in the Wynants Kill watershed.

The Wynants Kill is a very small tributary of the Hudson River (just 14.1 miles long with a drainage basin of 29.1 square miles), but it falls some 850 feet, notably down the steps of three shale overthrusts, each providing many excellent sites for the development of waterpower. The stream draws our attention because of its rapid industrialization, leading to the powering of the largest water wheel in the world by the mid-nineteenth century,¹ and for the cooperative organization of its waterpower in the wake of the 1820 court decision of *Merritt vs. Brinkerhoff*.²

These two exemplifications, extrinsic/intrinsic and technological/geographical, are complementary: the warp and weft of social networks. We learn from the Wynants Kill how geographic pattern becomes implicit in community, relieving the need for explicit control in the economic

¹ Henry Burden’s overshot wheel of 1851 was not the largest in diameter (two in Scotland were larger), but it provided the most power (278 horsepower before gearing down). It was 62 feet in diameter and 22 feet in breadth and operated continuously, day and night, until 1896. The Burden wheel was the subject of four graduate theses at Rensselaer Polytechnic Institute (RPI) between 1855 and 1867. Louis C. Hunter, *Waterpower: A History of Industrial Power in the United States, 1780-1930*, (Charlottesville, Va., 1979), 571.

² “Cases in the Supreme Court of the State of New York” 17 (Albany, N.Y., 1820): 306-25. For text of summary precedent see note 8.

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URL: <http://www.thebhc.org/publications/BEH/2005/harrisanddeblois.pdf>.

result. We learn how the multiple choices of technology serve communal needs. In a way, geography is the “invisible hand” shaping the commercial potential of the stream.³

Unlike the Hudson River and most of its tributaries, the Wynants Kill drains northward. When the glaciers retreated, gravels left behind in the watersheds of streams that drained southward were flushed downstream. In the Wynants Kill and its chain of small lakes, they remained as deposited to operate as ideal water holding sinks. Jedediah Morse observed that no New Yorker is more than 20 miles (or a day’s hike) from a navigable waterway.⁴ When Henry Hudson sailed into the largest fresh water tidal estuary in the world looking for a global sea route, he might have been disappointed that navigation ended at what would become Albany. However, the patroon Killiaen Van Rensselaer who received development rights to the area under the Dutch West India Company recognized the watery advantages. His 1,152 square miles were the gateway to an ocean port (and global markets), the Mohawk River leading west (especially important once canalized), and the valley going north to lakes George and Champlain to the St. Lawrence River. The Wynants Kill and its sister streams were not navigable, but offered the advantage of power potential to produce, at first, lumber and grain for both local use and shipment to benefit Dutch coffers. The patroon system of feudal settlement begun in 1629 was maintained in 1685 under British Royal Charter and upheld by the new republic.

Mill Site Leases

Stephen Van Rensselaer III, in taking over the management of the manor of Rensselaerwyck in 1785, determined to realize commercial gain, not mere subsistence, from his tenants. The contracts drawn up with the tenants of farms surveyed in 1788 for the patroon by Job Gilbert and Evert Van Alen (along the Wynants Kill and throughout “Middletown” as well as

³ Crucial to the “invisible hand” as a sensible notion is that individuals are rational (always, in the realm of numbers implicating scale) and selfish, or honest to a rational “self.” In the case of mill owners along this stream, individual acts compile themselves in the aggregate to maximize the communal result in terms of the scales of individual choice. The question is how the linkage works between the individual acts and the cumulative result: is it primarily hierarchical, according to a “mechanical” determinism; or is it social, working through personal, familial, institutional networks? We see that, on the Kill, it is more social than hierarchical: the “firm” arising to deal with the transaction costs less important than the efficiency of the landscape.

⁴ Jedediah Morse, *Geography Made Easy* (Boston, Mass., 1813), 150. From the entry on “New York”: “there are few places which are more than 15 or 20 miles from some boatable or navigable stream.”

FIGURE 1
Outline map of the Wynants Kill watershed (on a current New York State
Department of Transportation base map)



Source: Courtesy Warren Broderick.

Notes: With the approximate locations of the 19 water privileges, grouped: 1 to 3 in Troy, 4 and 5 between Troy and Albia, 6 to 8 at Albia, 9 and 10 below West Sand Lake, 11 and 12 in West Sand Lake, 13 to 18 in Averill Park (formerly Sand Lake), and 19 at Glass Lake.

List of Mill Changes at the Water Privilege (WP) Sites:

- (WP 1) Sawmill (1656-1700s), Grist Mill (1793-1858), Steel Works (1863-circa 1911), Coke Plant (1920-1972)
- (WP 1a) Iron Works (1862-1972)
- (WP 2) Fulling Mill (circa 1800-1807), Iron Works (1807-1989)
- (WP 3) Iron Works (1810-1898)
- (WP 4) Paper Mill (1802-1930), Hydroelectric for WP 7 (1912-1952)
- (WP 5) Paper Mill (circa 1810-1814), Flour Mill (1829-1858), Paper Mill (1858-1952)
- (WP 6) Grist Mill (circa 1820-1905), Textile Mill (c. 1905-c. 1956)
- (WP 6a) Bleachery (circa 1820-1841), Woolen Factory (1845-1891)

(WP 7) Woolen Factory (1827-1871), Knitting Factory (1875-1900), Box & Paper Factory (1900-1952)

(WP 8) Fulling Mill (circa 1800-1812), Wool & Cotton Factory (1812-1871), Knitting Factory (1875-1918), Yarn Factory (1918-1948)

Snyders Lake (488 feet above sea level)

(WP 9) Sawmill (1788-1891)

(WP 10) Grist Mill (before 1820-1891), Hydroelectric (1911-1924)

Reichards Lake (589 feet above sea level)

(WP 11) Grist Mill (1768-1950s)

(WP 11a) Cloth Works (1855-1880)

(WP 12) Sawmill (1788-1848), Cloth Works (1848-c. 1880), Knitting Factory (1880-1956)

(WP 12a) Knitting Factory (1909-1940), Carding & Spinning Factory (1940-1952)

Burden Lake (628 feet above sea level)

(WP 13) Sawmill (1788-1834), Fulling & Carding Mill (1834-1844), Paper Mill (1845-1891)

(WP 14) Cloth Dressing (1820-1827), Cotton Factory (1827-1834), Cloth Mill (1834-c. 1845), Woolen Mill (c. 1846-1870), Hosiery Mill (1870-1875)

(WP 15) Sawmill (c. 1810-1829), Cotton Factory (1829-1875), Warp Mill (1875-1886), Knitting (1897-1960)

(WP 15a) Grist Mill (1802-c. 1830)

(WP 16) Satinet Mill (1829-c. 1835), Grist Mill (c. 1835-1866), Knitting Factory (1866-1956)

(WP 17) Tannery (1823-1835), Sawmill (1835-1842), Tannery (1843-1862), Knitting Factory (1862-1880), Hosiery (1880-1891)

(WP 18) Sawmill (1788-1825), Woolen Factory (1825-1862), Hosiery (1862-1871)

Crystal Lake (770 feet above sea level)

(WP 19) Sawmill (1797-1806), Glass Factory (1806-1852)

Glass Lake (828 feet above sea level)

Crooked Lake (828 feet above sea level)

in the other areas of Rensselaerwyck) rented farmers the use of land and required them to make tax payments, while the patroon retained the water and timber rights and extracted one-quarter of the sale price every time the farm was sold. Van Rensselaer intended to lease the water privileges separately and advantageously.⁵ Eventually, there were nineteen water

⁵ In 1650, the patroon had taken away waterpower rights at the mouth of the Kill from Thomas Chambers, who had leased both the farm and the right to build a sawmill, and given them to another man who, in turn, asked to be released from the agreement. In 1656, Abraham Pietersz Vosburgh and Hans Jansz Van Rotterdam built the first recorded mill on the Wynants Kill.

privileges engineered on the Wynants Kill. We based this paper on our editing of a local history initiative to fully map these nineteen sites and to untangle the mill histories at each (see Figure 1 and list following).⁶ Van Rensselaer rented WP 11 to Joshua Lockwood and William Carpenter in 1768, and WP 1 to David DeFreest in 1793 to build gristmills. Both mills preceded the settlement of their areas. The site at the mouth of the Wynants Kill took advantage of riverine transport before Troy's founding in 1789. The site where the King's Road (completed 1754 from Bath, opposite Albany on the Hudson, to Deerfield in Massachusetts) intersected the Wynants Kill also exercised transport advantage, even before the hamlet of Ulinesville developed.⁷ With respect to WP 1 and WP 11, river and road gave these gristmills greater market reach.

Mead Merrill was leased the site at WP 19 (also near the King's Road) for a second sawmill in 1797 (he already ran one at WP 18; see Figure 2). However, even though Merrill leased an adjacent 209-acre parcel and was productive, Van Rensselaer terminated his and a neighboring farmer's leases in 1806 to build a glass factory in which he had a financial stake. As with the early sawmills (1788 leases to Hayner at WP 9, Fonda and DeFreest at WP 12, John Crannel at WP 13, Spencer at WP 18, and an 1820 lease to Gregory at WP 15), the glass factory consumed the standing forests in the watershed (the plentiful sand needed to be heated to temperature by a charcoal fire) and was moved to the Wynants Kill, having exhausted its woodlots on the west side of the Hudson. These factories were profitable only as long as there were adequate local resources. The glass-making business at WP 19 went through seven different company reorganizations before running out of fuel in 1852. By the same date, four of the five sawmills mentioned were in the textile business.

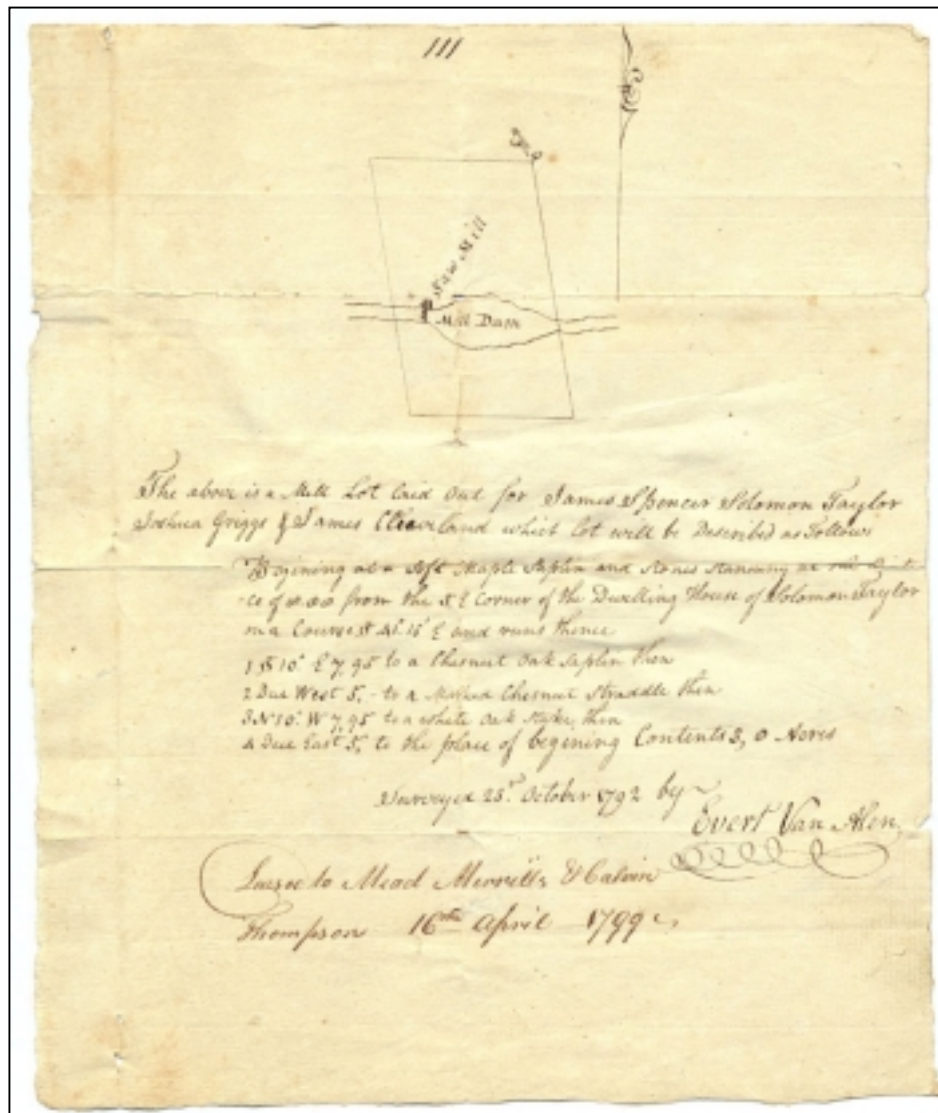
Mill Site Interdependency

Geography places mill owners along the same waterway in a de facto cooperative situation—a hierarchy of relations relative to positions on the stream, which can be read from mouth to head, or vice versa, depending on whether one is interested in waterpower or water control. The water privilege lessees along the Wynants Kill also had in common the threat of lease termination. The *Merritt vs. Brinkerhoff* court case in 1820 emphasized their interdependency. At the mouth of the Kill, Daniel and Jacob Merritt, who operated a flourmill, held WP1. Upstream, at WP2,

⁶ Robert J. Lilly, "The Wynants Kill: A Small Stream but Mighty," 2005, available through the Rensselaer County Historical Society.

⁷ "Thro' a Country Not well Settled: The "Albany Road" of 1752-1773," 23 Oct. 1999, papers collected by the Rensselaer-Taconic Land Conservancy, Rensselaer County Historical Society, Taconic Valley Historical Society, ed. Warren Broderick.

FIGURE 2
Survey map of a sawmill site on the Wynants Kill (WP 18), 1792, Evert Van
Alen; leased to Mead Merrill & Calvin Thompson in 1799



Source: Van Rensselaer Manor Papers, New York State Library Archives,
SC7079, box 10, folder 5.

John Brinkerhoff worked iron. During the dry summer of 1815, while the iron was heated to rolling temperature, Brinkerhoff impounded the entire flow of the Kill behind a new 28 foot-high dam, storing the water in his mill pond, for long enough to interfere substantially with the operation of the Merritts' grist mill. The Merritts won the suit with \$700 damages.⁸

⁸ "Merritt and Others, Against Brinkerhoff and Van Wagenen" *Cases in the Supreme Court of the State of New-York*, 17 Johns (Albany, N.Y., 1820), 306-25. Justice John Woodworth [Hunter, *Waterpower*, 154n1, is apparently mistaken in

In the wake of the assertion of the Merritts' rights, and after the instigation of private arrangements to safeguard the water supply, the mill operators decided to create a cooperative association.⁹ In 1829, the Wynants Kill Association was formed to shape and control the lakes that discharged into the stream and to draw down and drain the lakes in a way that would be most useful to the mill operators. The rationing of responsibility for costs was commensurate with the power extraction of their respective mills. At first, the proportioning was accomplished with shares: one to each member at or below the Uline Grist Mill at WP 11, with fractional shares to members above according to water use. With reorganization in 1848, the Wynants Kill Improvement Association (WKIA), made a fresh judgment for proportioning each mill owner's share according to the diameter of the water wheel, the volume of water used, and position on the stream; it was presumed that those nearer the headwaters had less interest in downstream improvements.¹⁰

Committees at each lake oversaw the construction of dams and negotiated with farmers for appropriate reservoir levels. Gates, closed at night and opened at dawn (or on whatever schedule might suit downstream needs), maintained a flow sufficient to run the mills, conserving water. Under the aegis of the Association, mill owners could better cooperate with the township governments in the watershed as well as with individual landholders. When the dam built by Richard Knowlson, who

his citing "Justice Wordsworth"]:

"Where several owners of mill-seats on a stream, have a common and equal right to the use of the water, though no action lies against the owner of a mill above, for any damage which the owner of a mill below may incidentally suffer from the reasonable use of the water by the former, for his own benefit; yet the owner of the mill above has not an unlimited right to use the water as he pleases, or to stop the natural flow of the stream, so as to destroy or render useless the mills below. And if he shuts down his gate, and detains the water for an unreasonable time, or lets it out in such unusual quantities as to prevent the owner of the mill below from using it, or deprives him to a reasonable and fair participation in the benefits of the stream, he will be answerable to the party injured to the extent of the loss he has thereby sustained."

⁹ In 1818, Nathaniel Adams (WP 3) contracted with Peter Moul for a fee of \$10 to draw down the pond on his farm to feed into the Kill. In 1820, a dam and control gate were built at the outlet of Orrey's Lake on Harman Snyder's farm, for a one-time fee of \$75 and \$5 yearly to open the gate in the morning and close it at night. Snyder stipulated that a half-inch hole be drilled in the gate to provide a constant flow of water for his cattle. Both initiatives would have benefited WPs 1 to 8.

¹⁰ The New York State Legislature by an act of 21 April 1846 created a trust "for the benefit of persons owning or occupying mill privileges on the stream called the Wynants Kill." The first trustees were Erastus Corning of Albany Nail Works, WP 2; John Townsend in partnership with Henry Burden of Troy Iron and Nail, WP 3; and Stephen Warren of Albia Cotton Factory, WP 7. The Association remained active through all the changes in water use; the final chapter is yet to be written about its rights to the Kill.

owned the glass factory at WP 19, was washed away in an 1846 flood, the Association allotted \$700 for its rebuilding. When the cost exceeded that, the Town of Sand Lake agreed to pay the \$197.25 deficit in return for using the top of the dam as a right of way for a road. In Joseph Hidley's painting of Glass Lake (see Figure 3), this road passed to the right beyond the Control Gate House on Glass Lake Road (leaving the Wynants Kill for the Kinderhook watershed draining south).¹¹

Eventually, the power of the Association was sufficient to help end the control of the patroon over water privileges. Stephen Van Rensselaer died in 1839, and his successor as patroon, William Van Rensselaer, had a heavier hand with the mill owners. An Anti-Rent Association formed under the leadership of Smith H. Boughton, M.D., who lived near the headwaters of the Kill, and George Cipperly, the lessee of WP 12 and the Association's secretary-treasurer. In 1844, Van Rensselaer served papers on Cipperly for back rent, threatening to destroy the dam at his factory site. The Wynants Kill Association rallied to Cipperly's aid, and in 1845 convinced the patroon to allow them to incorporate and purchase the flood lands of the Kill.

Links with Rensselaer Polytechnic Institute

The more enlightened self-interest of Stephen Van Rensselaer extended to importing the leadership and fostering the scientific development that stimulated industrial growth along the Kill. Knowing he was on the lookout for talent, the U.S. Minister to Great Britain sent a Scot, Henry Burden, with letters of introduction in 1819. Burden's inventive genius and organizational savvy led to the Wynants Kill powering the largest water wheel in the world¹² and to Troy's becoming the horseshoe capital of the nation.¹³

Van Rensselaer wanted to train genius as well as import it—and he founded the Rensselaer School (later Rensselaer Polytechnic Institute, RPI) in Troy in 1824¹⁴ to fulfill Amos Eaton's innovative program for the

¹¹ "Glass Lake" is one of two paintings of the hamlet, c. 1866, by Joseph Hidley, whose family was a 1776 tenant of Rensselaerwyck, in the Wynants Kill watershed, near Aries, "Orrey's" [now Snyders] Lake; Rensselaer County Historical Society, Troy, N.Y.

¹² Great Britain in general powered its industrial revolution with steam, but Burden was probably familiar with large water wheels in his native Scotland.

¹³ Samuel Reznick, "Burden Iron Company, Troy" in *Mohawk-Hudson Area Survey*, ed. Robert M. Vogel (Washington, D.C., 1973).

¹⁴ Daniel D. Barnard, *A Discourse on the Life, Services and Character of Stephen Van Rensselaer* [delivered before the Albany Institute, 15 April 1839, with an Appendix including a "Historical Sketch of the Colony and Manor of Rensselaerwyck"] (Albany, N.Y., 1839).

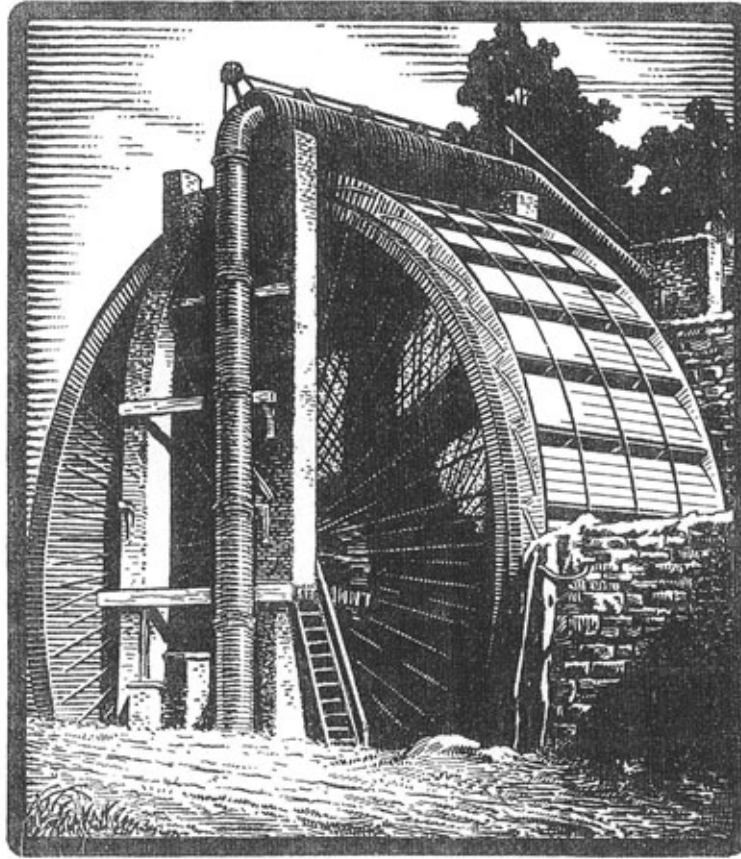
FIGURE 3
Glass House village



Glass House village is one of two similar oil paintings by Joseph Hidley, whose family were 1776 tenants of Rensselaerwyck, near Snyders Lake. Dated after 1866: the WKIA had erected a gate house, far right, at the outlet of the lake to control the dam sluice, along with a dike, which is being used as a promenade. The glass factory, burned down in 1852 and never rebuilt, was on the point of land on the far right (out of view). The building at far right was part of the glass works, and most of the other buildings housed glass factory workers; the large structure near the corner is a hotel. Stage traffic on the road over the dam dominates activity in the painting, and the lake has attracted summer visitors, who paddle canoes on the lake.

Source: Collection of the Rensselaer County Historical Society, Troy, New York.

FIGURE 4
Henry Burden's Water Wheel



Woodcut by Troy artist Will Cooke of Henry Burden's water wheel at WP 3. The behemoth stopped turning in 1896, and the building around it was demolished circa 1900. By local request, the noble ruin of the wheel was left standing, and it attracted tourists and artists until it collapsed in 1914 (the scrap was sold before World War II). Images such as this one encouraged the assumption that the wheel had operated in the open, instead of encased in factory buildings straddling the Wynants Kill. Source: Collection of the Rensselaer County Historical Society, Troy, N.Y.

the "application of science to the common purposes of life."¹⁵ He had earlier commissioned Eaton to make an 1819 survey of his lands for more

¹⁵ Emma Hart Willard, a well-known educator of young women in Vermont, determined in 1819 to move her efforts to the headwaters of navigation in New York State. A pamphlet "An address to the Public; Particularly to the Members of the Legislature of New York, Proposing a Plan for Improving Female Education," published and distributed at her own expense, garnered support from Monroe, Jefferson, Adams and other influential men. However, even though she

productivity.¹⁶ Waterways were, from the beginning, on the curriculum. The school's first site was on U.S. Lock #1 in the state dam on the Hudson (a system of hydrological power which was more like the Lowell mills model).¹⁷ In 1835, it moved to the old Van der Heyden mansion on the hill above Troy, through which ran a rill draining a pond atop the same shelf of land down which the Wynants Kill finally tumbles. Eaton called it Laboratory Creek, to augment his announced course of study, which emphasized practical engineering to understand the force and application to machinery of water, steam, wind, and animal power.¹⁸

The men who leased the water privileges and built mills were, within the patroon's hierarchy and through their own Association, in a relationship of authority in their communities. They not only provided jobs and contributed to a cash economy; they almost naturally took over the leadership of town councils, bank boards of directors, and initiatives to build roads, canals, railroads, and so forth. Many of them were trustees of, or otherwise affiliated with, RPI.¹⁹ The mills also changed hands (and direction) following familial ties.

established a school at Waterford on the west bank of the Hudson, north of Albany, the state legislature would not fund her. The City of Troy would, though, and raised money by a special tax to buy her a building in 1821. Before it was ready for occupancy, she held classes at Eaton's Lyceum of Natural History, and then, when his Rensselaer School opened, she studied with Eaton. If Eaton's passion was geology, Willard's was geography, particularly mapping. In 1822, she and William Channing Woodbridge collaborated on *A System of Universal Geography on the Principles of Comparison and Classification*, which made her famous. The Emma Willard School's present site is near Albia in the Wynants Kill watershed. See Alma Lutz, *Emma Willard: Pioneer Educator of American Women* (Boston, Mass., 1964).

¹⁶ These were the first surveys published anywhere that offered geologic information for the benefit of farmers: crops to soil typing, drainage, fertilizer, and so forth. See Amos Eaton, *A Geological and Agricultural Survey of Rensselaer County in the State of New York* (Albany, N.Y., 1822).

¹⁷ At mills such as the Lowell system, the vertical integration of a waterpower facility combines hydrological engineers to maintain the dams and canals with calibrated flows, the mill buildings, and perhaps even wheels and transmissions; machinists making and maintaining the machines; and the managers of industrial enterprise.

¹⁸ Amos Eaton, manuscript journals, Special Collections, Rensselaer Polytechnic Institute, Troy, N.Y.

¹⁹ To 1884, a president (John F. Winslow 1863-1867, WP 1, 2), a vice-president (David Buel, Jr., 1829-1860, WP 4), and 11 trustees (John Flack Winslow, 1860-1868, WP1, 2; David Buel, Jr., 1829-1860, WP4; Joseph M. Warren, 1849-?, WP 8; Gurdon Corning, 1843-1847, WP 7; Richard P. Hart, 1826-1843, WP 1; John Augustus Griswold, 1855-1856, 1860-1872, WP 1; Isaac McConihe, Jr., 1860-1861, WP 7, 15; James Somerville Knowlson, 1866-?, WP 7; Francis S. Thayer, 1868-1880, WP 1; Alexander L. Holley, 1865-1867, 1870-1882, WP 1; and Jedediah Tracy, 1824-1825, WP 8) were Wynants Kill mill owners. Burden's

Industrial Diversity

With the various levels of cooperation in place, the mills could better respond to change. Instead of developing into a single-product mill stream (like the textile mill streams in the Connecticut River Valley²⁰ or a paper mill stream as in western Massachusetts²¹), the industry activity on the Wynants Kill was always diverse.

At the most local level, there was probably vertical integration—for instance, of bakery and brewery at the grist mills of the Wynants Kill—a common pattern both in the Old World and in New England. Where mills changed either product or ownership, there were different styles of succession. A site might go through several ownerships, but remain dedicated to the same kind of manufacture; for example, after the business moved to Massachusetts chasing trees for fuel, the glass factory site at WP 19 was not again used for industry. A site might diversify at the same mill (the gristmill at WP 11 ground grain from 1768 to 1951, though it branched out into cider pressing in the autumn); a site might change radically to follow market opportunities (WP 1 hosted a gristmill to produce commercial grade flour until 1858, when it was gobbled up by the Bessemer behemoth that came to dominate an iron industry spreading over the three water privileges at the stream's mouth).

The Straw Paper Industry and Family Dynamics

There were two sites, however, that remained, more or less, dedicated to one industry and influenced other mills on the Kill. The first of these was

nephew, Henry, graduated from RPI, but took his practical course at Burden Iron Works (1872-1879) in charge of the blast furnaces. Thereafter he was in charge of the furnaces at the competing Albany Iron Company. However, by then, the Cornings and the Burdens had symbolized their interdependency; the former donated the land for the latter to build a Presbyterian church at WP 2 (which, now de-consecrated, is causing a new dispute among Cornings and Burdens over ownership). Six other Burdens entered RPI, from 1834 to 1881, but did not graduate. Henry B. Nason, ed., *Biographical Record of the Officers and Graduates of the Rensselaer Polytechnic Institute* (1824-1886) (Troy, N.Y., 1887).

²⁰ See Agnes Hannay, *A Chronicle of Industry on the Mill River*, Smith College Studies in History vol. 21, nos 1-4 (Northampton, Mass., Oct. 1935-July 1936). The Mill River, like the Wynants Kill, was also a small stream (flowing into the Connecticut River above Northampton) whose mills diversified, but chiefly within the textile field (wool, buttons, and silk).

²¹ See Judith A. McGaw, *Most Wonderful Machine: Mechanization and Social Change in Berkshire Paper Making, 1801-1885* (Princeton, N.J., 1987), concerning the paper-making industry in the Housatonic valley of Berkshire County, western Massachusetts. McGaw coined the term "mutually-made men" for her successful mill owners, which is equally applicable to those of the Wynants Kill.

the succession of father and son dynasties that developed the paper mill site at WP 4: the Buels, the Howlands, the Smarts, and the Tompkinses.

David Buel, who moved to Troy in 1797, operated the first papermaking mill on the stream in 1802 and, with his son David, began making a superior royal printing paper from rags ground with waterpower. The severe shortage of rags for paper during the 1820s and 1830s often led to the use of raw cotton direct from Southern fields. Particularly in Troy, inventors looked for a way to turn almost anything else into paper slurry. Henry Burden's first U.S. patent in 1822 was for a flax- and hemp-grinding machine for paper pulp, and six other Troy area residents filed patents under the same heading in 1829 and 1830. The gristmills of the Wynants Kill could supply all kinds of straw and, for a time, the Kill contributed to a burgeoning straw paper industry in Troy, marketing a heavy grade of wrapping paper much in demand for railway express and other mercantile packaging. (The largest early straw paper mill was William and Alexander Orr's at the state dam, U.S. Lock #1, on the Hudson).²²

The Howland brothers, Thomas and Joseph, ran the paper mill from 1826 to 1853, when Joseph Smart bought them out and sold the enterprise to his sons Joseph and Andrew, who turned 300 tons of straw and 300 tons of coal into 43,000 reams of paper. In 1859, another brother, Robert, bought the neighboring flour mill at WP 5 and began making paper. Enter the Tompkins family: father Staats, who bought a paper mill at WP 13 in 1854, and his two sons, D.D. & E.P., who bought WP 4 in 1866. Andrew Smart bought out the former Tompkins mill at WP 13 in 1873 to make 700 tons of straw wrapping paper per year until 1891, while brother Robert bought in again at WP 4, also in 1873.

The Textile Industry and Community Growth

David DeFreest began the textile industry on the Wynants Kill around 1800, at WP 2, building a fulling mill to wash and fluff out homespun cloth and wool. However, the iron industry took over that site for good in 1807. Upstream at WP 6, Gerret Van Schaick shared his grist mill site with a bleachery (WP 6a) around 1820, the latter factory using chemicals to bleach and then dress and calendar cloth for 1 to 2 cents a yard. The nearby Troy Wool and Cotton Factory, opened in 1812 at WP 8, produced the cotton cloth. The three mill sites in the village of Albia (WP 6, 7, and 8) developed a community industry.

Tobias Schermerhorn first leased the water privilege at WP 8 to build a fulling mill around 1800. It was bought out by a group of Troy merchants and in 1812 enlarged for the manufacture of wool and linen goods; their

²² William Orr claimed to have invented and used the first pattern-bearing cylinder press for wallpaper, though he did not patent it. He also claimed to have made the first merchantable printing paper with wood fiber (25% bass wood fiber to 75% rags) in 1854. See Arthur James Weise, *The City of Troy and Its Vicinity* (Troy, N.Y., 1886), 230.

water-powered spinning mule could keep thirty to forty hand-operated looms busy making cloth in nearby homes. In 1813, John and Marvin White and Randolph Taylor moved to Albia and rented machine and trip hammer shops belonging to the Troy Wool and Cotton Factory to display the various kinds of cotton machinery they had been making for use in Rhode Island and Connecticut factories. Their power looms transformed the factory, so that by 1830, 2,000 spindles and sixty power looms produced 74,000 pounds of yarn woven into 250,000 yards of sheeting.

In 1827, one of the owners of the Troy Wool and Cotton Factory joined with one of Troy's leading businessmen to open a second factory in Albia at another site (WP 7).²³ They were poised to take advantage of the Merino wool craze. By 1830, the factory had 1,000 spindles, twenty power looms to weave satinet (a fake satin from wool on a cotton warp), and ten broad flannel looms.

A community grew up with the two mills. In 1830, 70 of the 80 employees at the cotton factory, and 75 of the 80 at the woolen factory, were women. In 1824, a Mrs. Frost established a nursery to care for the children of the workers, and a day school also operated throughout the year, averaging eighty to ninety students. Nearby, from circa 1825, WP 5 shared land with Troy's first House of Industry.

The mills changed hands and were upgraded by a succession of prominent Troy citizens. In 1841, Stephen Warren and then his son Joseph bought into WP 8.²⁴ Like four other mill owners, Joseph Warren served as mayor of Troy.²⁵

In 1854, they formalized the relationship among the three mill sites, incorporated under the name of Troy Woolen Co., and assumed a 13 percent interest in the WKIA. We can measure the company's success by the 1855 census, and by how quickly the mill building at WP 7 was rebuilt after a fire on July 4, 1857; by December they were up and running.

In 1867, Troy ranked as the fourth largest wool market in the United States, behind Boston, New York, and Philadelphia, with sales of 10 million pounds of fleece wool. Wool dealers whose advertisements had appeared in the Troy City Directories in the previous three decades were, themselves, active in the Wynants Kill mills: Jedediah Tracy (WP 8); John Kerr (WP 18); Richard J. Knowlson (WP 19); son James S. Knowlson

²³ Gurdon Corning, 1781-1853, arrived in Troy in 1801 from Norwich, Conn., served on the commission to build a bridge across the Hudson in 1814, on the Western Canal Commission, as trustee and president of the Board of Education, trustee of RPI, supporter of the Troy Orphan Asylum, director of the Farmers Bank, and three terms as Mayor of Troy.

²⁴ Joseph M. Warren's estate in Troy became the present campus for RPI, where he had been a Trustee.

²⁵ Mayors of Troy: Richard P. Hart, 1836-1837 (WP 1); Gurdon Corning, 1843-1847 (WP 7); Joseph M. Warren, 1851-1852 (WP 8); John A. Griswold, 1855-1856 (WP 1); Isaac McConihe, Jr., 1860-1861 (WP 7, 15).

(affiliated with WP 7); son Andrew B. Knowlson (owned WP 16); and John Rankin, who was president of the Albia mill (WP 7) when he died in 1864. However, the wool trade in the area climaxed after the Civil War, and the Troy Woolen Co. went bankrupt in 1870.

The Knitting Industry: Late Growth

What followed was an interesting change among all the textile mills then operating on the stream. By mid-century, many of the mills upstream of Albia had turned to working on the various steps in producing woolen cloth. In West Sand Lake, the Uline family diversified at their water privilege (WP 11) and built a wool-carding and cloth-dressing mill on the bank opposite their gristmill around 1855. The Cipperly sawmill at WP 12 had also switched to making satinet around 1848. In Sand Lake, at WP 14, what had been a satinet and then a cotton factory making cheap cloth for the Southern trade was rebuilt as a woolen factory in 1846. At WP 15 the “Sand Lake Cotton Factory” of 1835 made cotton warp for the satinet mill upstream at WP 18, where the mill site had processed wool since 1825, and in 1842 it was renamed the “Sand Lake Wool Factory.”

Then, as the wool industry flagged in the 1870s, mills switched to knitting from woolen yarn all along the length of the Kill.²⁶ In Albia, the Troy Hosiery Mfg. Co. operated from 1875-1884; then the two mill sites diverged again, into the Albia Knitting Mill (yarn & stockings) and the Wynantskill Knitting Mill (shirts & drawers) (see Figure 5). In West Sand Lake, Akin & McLaren knitted shirts and drawers at WP 11. In Sand Lake, the Cotton Factory continued making warp at WP 15, but at WP 16 a hosiery mill replaced the gristmill in 1866. In 1862, an entrepreneur purchased WP 17, which had been a tannery off and on since 1823, for a knitting factory (shirts and drawers) and converted the WP 18 woolen mill to a hosiery mill.

Disaster of 1891 and Rebuilding

In 1889 the WKIA had hired David Maxon Greene, professor of geodesy, road engineering, and topographical drawing at RPI, to survey the dams on the upper lakes of the Kill. He found the dams, dikes, gates, spillways, trunks, and so forth seriously eroded or under-built and made many detailed recommendations to make the whole water system both safer and more productive. He offered as a cautionary tale the recent devastation in

²⁶ This was a national pattern; knit-goods manufactories increased in number from 248 to 796, 1870 to 1890; see Victor S. Clark, *History of Manufactures in the United States* (New York, 1929), 443. However, this trend was probably also due to the improvements made to Clark Tompkins' patent for the industry standard upright rotary knitting machine by his sons Albert and Ira, who succeeded him in 1877. The Tompkins factory was on the Poesten Kill, a neighboring stream to the Wynants Kill that entered the Hudson farther north in the city of Troy.

the Johnstown Flood. The mill owners complied with all his suggestions, which meant that, when the watershed suffered its own immense flood two years later, the lake dams held and prevented even worse damage.

FIGURE 5



Advertisement for the revolutionary upright knitting machine made in a Troy factory powered by the Poesten Kill, and used extensively in the burgeoning knitting industry of the Mohawk Valley of New York and New England. Source: from *The Troy Directory, 1878* (Troy, N.Y., 1877), authors' collection.

Although post-Civil War steam engines and the late nineteenth century advent of electrical power generation relaxed the geographic constraints on industrial activity and eroded the viability of the smaller mills along the Wynants Kill, the coup-de-grace was a rainstorm in late summer 1891 that caused a freshet to annihilate mills all down the system. Bolts of fabric, cords of wood, reams of paper, and whole mill buildings washed up at the mouth of the Kill in Troy, taking out fifteen bridges, including a major railway trestle; many businesses did not rebuild.

However, knitwear inspired a fascinating local anomaly: a post-industrial flowering of a twentieth-century complete-system mill town in the hamlet of Averill Park. Peter McCarthy, an experienced mill man and prominent citizen of Troy, whose summerhouse was opposite the abandoned mill sites at WP 15 and 16, convinced William D. Mahony, a local civic leader to form a partnership in 1897. They bought up the old mill buildings and sites, and put the labor force back to work spinning cotton and wool yarn and knitting hosiery and underwear (Faith Mills). When they expanded after a fire in 1906, the knitting machines were steam-powered. They used water from the Kill for fire protection as well as for washing and scouring the knit goods.

The partners expanded throughout the century's first decades, keeping the rural community workers happy with a sumptuous Clubhouse built in 1919, complete with dance hall, motion picture parlor, cafeteria, bowling alleys, pocket billiard room, and shower room. In 1923, they rebuilt the dam upstream from their operations to provide hydroelectric power (via a Rodney Hunt water turbine and a 75-kilowatt Westinghouse alternating current generator) for the knitting machines. Government contracts providing knit underwear for the military during the two world wars kept the factories humming. In 1939, they bought the remaining active factory in West Sand Lake, at WP 12a and in Albion at WP 6, and operated there from 1940 until the 1950s; the end for the whole enterprise was 1960.²⁷

Industrial Climax and Its "Portrait" in the 1855 Census

Much has been written about iron and steel, the "climax" industry in Troy, which involved WPs 1, 2, and 3 on the Kill. The first iron process was a slitting mill at WP 2 in 1807, which evolved into the Albany Nail Factory under the directorship of several investors, among them Erastus Corning and John Flack Winslow. In direct competition with the Albany Nail Factory, the Troy Nail Factory at WP 3 (founded in 1810 as Converse Iron Works) was by 1848 owned outright by Henry Burden. Burden's inventions dominated the whole industry: particularly the rotary concentric squeezer, a machine for working wrought iron adopted by iron industries world-wide; a hook-headed spike machine that fueled the rapid expansion of railroads in the United States; and a horseshoe machine

²⁷ Samuel T. Freeman & Co., auctioneers, "Industrial Real Estate, Machinery and Equipment in the West Sand Lake Plant (Woolen Mill) of the Thermo Mills, Inc., Located at West Sand Lake, N.Y.," (Boston, Mass., 1939) [authors' collection].

FIGURE 6

Name of Person or Company owning the Shop, Factory, Mine, Quarry, or other object of Industry	Name of Business or Manufacture	CAPITAL INVESTED		Notes for 1855 Census of New York State						PERSONS EMPLOYED with average weekly wage			
		In Real Estate	In Tools and Machinery	RAW MATERIALS			ANNUAL PRODUCT			Adults		Children under 18	
				Quantity	Kind	Value	Quantity	Kind	Value	Men	Women	Boys	Girls
Bills & Thayer (WP 1)	Crystal Palace Flouring Mill	\$12,000	\$6,000	125,000 bu 25,000 bu 32,800	Wheat Rye Barrels	\$135,000	375,000 bls. 5000 100,000 bu	Wheat flour Rye Flour Feed	\$256,250	8	\$35		
Coming Winslow & Co. Proprietors of Albany Iron Works (WP 2)	Iron Steel Nails Spikes & Rivets Axles RR Chairs &c	\$200,000	\$100,000	12,000 Tons 8,000 Tons 1,000 Tons 1,600 Tons 1,000 Tons 350 Tons 250 Tons 130000	Coal Pig Iron Blooms Bar Iron Ore Sand Clay Kegs	\$70,000 264,000 50,000 80,000 4,000 700 625 23,000	12,500 Tons 31,000 kegs 200 tons 30 tons	Manufactured Iron Spikes &c Nails Wagon axles Crow bars	\$910,000 \$127,000 \$20,000 \$3,000	330	\$32 1/4		120
Troy Iron & Nail Factory (aka Burden Iron Works) (WP 3)	Manufacture of Iron Generally	together-----	\$96,000	9,580 Tons 12,359 Tons	Pig Iron Scrap Blooms Coal	20 to 40 Dollars a Ton 	5,971 Tons 1,430 Tons 2,000 Tons 148,060	RR Spikes Ship & boat Spikes &c Rivets & Horse shoes Nails Car Iron Nail Kegs	- - - \$876,354 - - - -	386	\$32 1/4		47
Joseph W. & A.S. Smart (WP 4)	Paper Manufactory	\$5,000	\$6,000	300 Tons 300 Tons	Straw Coal other incidental expenses	\$2,100 2,100 4,000	43,000	Paper Reams	\$13,000	7	\$20	3	\$14 2
Jonathan Richardson (WP 5)	Flouring Mills	\$6,000	\$6,000	25,000 bu	Wheat & other grains	37,500	5,555 bls 12,000 bu	Flour Feed	\$40,000	3	\$26		
Troy Woolen Co. (WP 7)	Satinet	\$15,000	\$10,000	230,000 lbs 247,705 yds Lacawana coal Soap Labour Oil Transportation & other Freights other expenses	Wool Cotton warp Dye stuffs Finer wool 1,500 3,700 20,000 2,300 3,000 1,090	\$85,000 12,450 1,869 200 	226,713 yds	Satinet	\$131,695	38	\$30	22	\$15 10 5

Albia Cotton Factory (WP 8)	Print Cloth	\$15,000	\$10,000	114,000 lbs	Cotton Oil Starch Fuel	\$11,400 1,300 600 800	800,000 yds	Print Cloth	\$36,000	20 \$33	28 \$14	14	15
Labour & other expenses 21,000													
David Clum (WP 10)	Flouring Mill	\$3,000	\$600	10,000 bu wheat, oats, corn	Rye buck- wheat	\$6,000	8,000 bu	Bread stuff	\$600	2			
Andrew Uline (WP 11)	Flouring Mill	\$1,000	\$1,000	10,000 lbs	Rye buck- wheat	\$8,000	9,000 bu	Bread stuff	\$606	2			
John Donaldson (WP 11a)	Clothing Works	\$1,500	\$2,000	10,000 lbs	Wool	\$3,200	15,000 yds 5,000 lbs	Cloth Yarn	\$10,500 \$3,700	2 \$15	\$9	1	1
A. & G. Cipperley (WP 12)	Clothing Works	\$1,000	\$1,500	2,000 lbs	Wool	\$600	2,600 yds	Satinet	\$15,000	3	2 \$8		2
L.T. Tompkins & Co. (WP 13)	Wrapping Paper	\$6,000	\$5,000	500 tons	Straw Wood	\$1,400 \$600	40,000 reams	Paper	\$16,000	12 \$25	21 \$12	1	
Cornelius Schermerhorn (WP 14)	Woolen Mill	\$4,000	\$2,500	54,942 lbs 30 cords 10 tons 350 gallons 1000 bri 10 bu	Wool Wood Coal Oil Soda ash Salt	\$19,240 75 87 150 40 8	310,700 yds	Yarn	\$27,360	4 \$21	1 \$14	3	1
Arnold, Hunt & Co. (WP 15)	Satinet Warp	\$20,000	\$10,000	100,000 lbs	Cotton	\$12,000	700,000 yds	Satinet warp	\$40,000	12 \$30		12	14
Arnold, Hunt & Co. (WP 16)	Grist Mill	\$3,000		15,000 bu 15,000 bu 5,000 bu	Corn Rye Oats	\$18,500 18,450 3,000	840,000 lbs 840,000 lbs 140,000	Seed & feed Flour & feed Feed	\$14,500 19,200 3,200	2 \$30			1
Gershom Tabor (WP 17)	Tanner & curer	\$4,000	\$2,000	150,000 lbs 300 cords 400 bu 50 cords	Hides Hem. bark Lime Wood	\$10,000 1,000 152 200	78,000 lbs	Leather	\$15,600	5 \$25			
Joel B. Peck	Saw mill	\$750	\$100		Logs	\$300	100,000 ft	Lumber	\$750	2 \$25			
George Horton	Saw mill	1,000	100		Logs	750	150,000 ft	Lumber	1,500	2 \$25			
Orlando Horton	Saw mill	1,000	100		Logs	350		Lumber	500				
Manning Reichard	Saw mill	800	100		Miscellaneous	160		Miscellaneous	525				
Joseph Bly	Saw mill	900	100		Miscellaneous	450		Miscellaneous	1,000				
William Green	Saw mill	800	100		Miscellaneous	315		Miscellaneous	700				

Chart from the manuscript data of the enumerators' reports for the Census of the State of New York 1855, for industries denominated as being waterpowered, of the Wynants Kill watershed. [Under "persons employed" the figure refers to average monthly wages, not weekly wages.] Source: New York State Archives.

capable of making sixty horseshoes a minute that shod all Union mounts in the Civil War.

Burden expanded into WP 1a in 1862; his “lower works” were steam powered. However, Corning & Winslow had the Bessemer process, importing it via engineer A. L. Holley from England in 1863 (after their iron factory rolled the plates for the *Monitor* “of scrap iron, greatly superior in strength and purity to puddled ship plates.”)²⁸ The first Bessemer furnace in the United States was erected at WP 1, opposite Burden’s lower works.

One important data resource is the enumerators’ manuscript for the 1855 Census of the State of New York. Containing more detail than was eventually published, the notes give us a “portrait” of activity along the Kill (see Figure 6). The “heavy” industry at the first water privilege sites was also the heaviest capitalized and paid the highest wages.²⁹ However, women at the textile sites in upstream Albia earned as much as men in mills even further upstream. We have included all the Wynants Kill watershed industries that were listed as water-powered, which included a brace of small sawmills, none of which were sited at an established water privilege but were, perhaps, on small tributary streams. Certainly, there was still the need to accommodate local building with wood, not to mention the large demand for barrels and pallets for products, particularly of the iron works and commercial gristmills.

Postal Activity Data and Reinvention

We also want to highlight a rich vein of information from the U.S. postal system, rarely mined by scholars (see Figure 7). To discover the signature of local activities we used the Official Registers, which reported postmaster compensation, a percentage of postal revenues, from 1816 to 1911.³⁰ Our

²⁸ John F. Winslow, 16 Sept. 1861, Letter to Captain John Ericsson, quoted in Arthur James Weise, “City of Troy and its Vicinity” (Troy, N.Y., 1886), 309.

²⁹ The highest wages on the Wynants Kill had been for the skilled glass blowers (of German and Scots heritage, to make cylinder and crown glass, respectively) at the glass factory, WP 19. Wages were as high as \$60 a week and the factory employed as many as sixty men. In 1825, 467 boxes of window glass valued around \$3,000, were made and sold in ten days. However, the factory burned in 1852, the business already having moved eastward into Massachusetts for more fuel. Rachel D. Bliven, et al., *A Resourceful People* (Rensselaer County Historical Society, 1987).

³⁰ In 1980, we generated a postal activity index of the village of Schaghticoke (on the Hoosick River, a large mill stream forming the northern border of Rensselaer County) for Beth Klopott’s doctoral dissertation in history at the State University of New York, Albany. The index showed a plummet in gross postages in the 1847 to 1849 period uncorrelated with any other known factors. On a hunch, we discovered that the first seven months of 1847 were devoid of precipitation in the area—the worst drought for the fifty-year period before 1876, and a killer for industries on an unregulated stream with no natural reservoirs. This same

thesis is that postal revenues reflect the degree of relationship between community and country, and provide an index for the timing and significance of historical narration.

The graph of postmaster compensations for Sand Lake, for instance, shows the signature of the loss of the Glass Factory to fire in late 1852. However, it is instructive that the fortunes of the factory apparently had been declining for quite a while. The postal activity at the hamlet of Alps, the nearby settlement of charcoal burners serving the glass factory at WP 19, was similar. We might hypothesize that with the exhaustion of the woodlots, the closing of the factory foregone, the destruction of the factory by fire was incidental, if not intentional.

For the story of reinvention, the most remarkable event was the birth of the post office in the Sand Lake village called Averill in 1880. Until then, the Sand Lake post office (open 1815) remained tied to the proximity of the glass factory.

Our data show that while Sand Lake (at Sliter's Corners, with an index of 1) remained an average post office, Averill Park (in what had been the village of Sand Lake) over the course of a generation grew to twice the productivity of the average post office; the two offices, serving the same vicinity, trebled the national average.

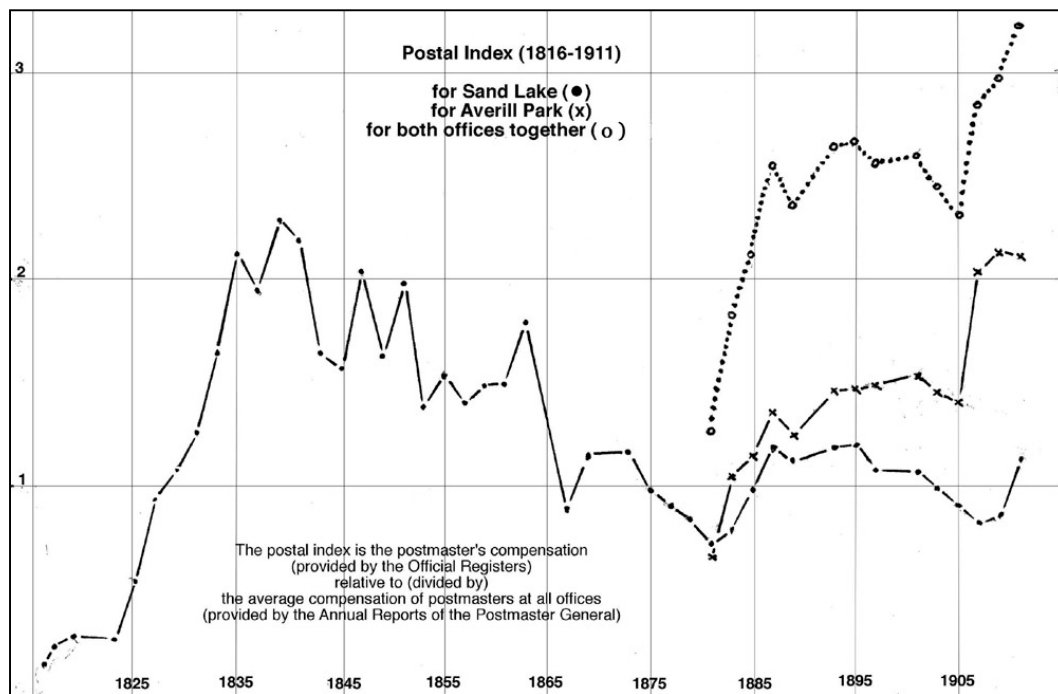
During this same period, the fortunes of water-powered mill towns had to adjust to competition from steam power (steam engines were made in Troy). After the flood of 1891, the mills could not afford to rebuild. Moreover, during the entire period the population of the area had remained a relatively constant 2,000. What caused this renewal and extraordinary growth?

The success of Faith Mills after 1897 certainly contributed to the rise in the area's fortunes. However, our conclusion is that it was primarily due to a concerted development of the Town of Sand Lake as a summer resort. Beginning in 1885, the postal contract (#6272 Troy to Stephentown, 23 1/4 miles, six times a week) allowed for six additional trips per week between Troy and Sand Lake from July 1 to September 30 (indicating that it had a summertime surge in mail).

James K. Averill was a key figure in this new industry; a local man, but also a powerful New York City lawyer, he began to buy up farms formerly leased by the patroon and to map out cottage developments. He renamed the sites: the lake at Sand Lake became Crystal Lake; the hamlet became Averill in 1880, and Averill Park in 1882 when he built a pleasure park on

drought may have affected the iron industries on the Wynants Kill, to the extent that the next year Burden was able to buy out his partners and take control at WP 3. Perhaps mindful of that drought, he built a dam at his own (rather than the Association's) expense on the Wynants Kill upstream of WP 3 in 1849 to form Burden Pond for his own greater reserve.

FIGURE 7
Data in the Official Registers



Source: Authors' collection.

the shores of the lake. He formed a company to build an electric trolley system to link with Troy in 1895 (the Troy & New England Railroad, which also carried freight, including raw material for the mills). He joined the WKIA, as he had purchased land that included two dams, and insisted on the "pleasure grounds' " rights to set the summer water level.³¹

Averill's initiatives built upon an infrastructure of hotels (soon augmented by boarding houses, holiday camps, and farm resorts) and a tradition of stocking the Kill and the lakes with sports fish. By the early twentieth century, a resort on Crooked Lake (served by the Sand Lake post office) was a favorite haunt of Theodore Roosevelt and other sports enthusiasts from New York City.

A Sand Lake Springs bottle was recently retrieved at the site of the last industry at water privilege #10 on the Wynants Kill (see Figure 8). The

³¹ TLS, 7 June 1898, on printed letterhead "Averill Park Land Improvement Co." in the papers of the Wynants Kill Improvement Association, Rensselaer County Historical Society. "It seems to me unfair that the pleasure grounds should be robbed of the attraction the lake affords and the mills compelled to remain idle in the Summer months, or be operated by steam power, simply because there is no one to oversee or govern Gabler's action. . . . My pecuniary interests warrant my giving the matter personal attention."

soda water business (1926-1960) used a nearby natural mineral spring; the stream water was used just for washing bottles. Nevertheless, the business occupied an industrial site that had been a grist and cider mill before 1820; it was destroyed by flood in 1891 and not rebuilt because of the decreasing demand for grain processing and apple pressing, which were met by a similar mill at nearby water privilege #11 that continued operating until the 1950s. The falls (in the background) were harnessed for a hydroelectric plant (1911-1924) to provide light from dusk to 11 p.m. for the hamlet of West Sand Lake (the first light bulb to be installed was over the pool table at the local hotel). Among the attractions marketed to summer visitors were both electricity and flavored soda water.

FIGURE 8



Source: Photo courtesy Nadine Baumgarten.

Conclusion

The postal activity in the upper Wynants Kill Watershed was never more than 1 percent of Troy's and, according to most other measures, the Kill is a small stream with a modest history. Nevertheless, it industrialized rapidly, contributed greatly to the growth of the city of Troy, and responded quickly to reinvention as a recreational destination. The reservoir lakes along the Kill gave it an advantage in water-powered industry. They also gave it an esthetic advantage: the powerful mill owners of Troy were attracted to building their summer, or even permanent, homes by the lakes, and thereby had a stake in changing rather than abandoning enterprises. Under the aegis of the WKIA, they

could retool the small mills on an experimental basis. Industry in the watershed in 2005 is dominated by mining the glacial till to build roads and buildings elsewhere, even as the inhabitants celebrate the watery landscape with its robust ecology.³²

³² The upstream hamlets such as West Sand Lake, Averill Park, and Sand Lake depend on household wells for water (though there is town sewerage), only possible because of the good drainage. The lakes still support swimming, boating, and both ice and summer fishing, though there is only one public access for all town residents at the Town of Sand Lake Beach, Reichards Lake. Averill's pleasure park on Crystal Lake survives as a beach and event site open to the public for a fee. Property values on the lakes are high for the area, those around Crystal Lake the highest.