

## THE BUSHKILL CREEK

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Easton owes its original and continued prosperity, in a great measure,  
to the water powers of the Bushkill Creek

Matthew Henry

The Bushkill Creek, rising from several springs on the southern flank of Blue Mountain in Moore and Bushkill Townships, flows south and east through Northampton County. Just below Stockertown, the main branch is joined from the east by the Little Bushkill or East Branch, also known as LeFevre's Creek. The creek continues south, forming the boundary between Forks and Palmer Townships before turning east. It enters the Delaware River in Easton. About twenty miles long, the Bushkill drains a total of seventy-five square miles in four townships.

The first name given to the creek by Europeans was Lehicton, a corrupted version of the Delaware Indian word for "where the writings were drawn." The word, over the years spelled "Lehietan", "Lehieton", and "Leheihan" was also thought to have meant "passed over on a bridge of driftwood." The word Bushkill, in common usage since about 1800, may have derived from a Dutch word meaning "bushy creek" or "brushy stream."<sup>1</sup>

Although artifacts including stone projectile points, pestles, choppers and scrapers have been found in the woods and fields along the creek, an inventory of prehistoric sites adjacent to the Bushkill is incomplete. No systematic field work has been undertaken along the entire length of the creek, which affords many likely sites of archaeological significance. Seasonally migrating Delawares established a trail up the creek from the Delaware which branched into two routes; one which trace the southern side of the creek to the north before heading overland to Wind Gap. The other, western branch connected with the "Old Warrior's Trail" at Lehigh Gap.<sup>2</sup> In the History of Northampton, Franklin Ellis noted that a number of Indians, residents of Forks Township, were buried on land owned by the Wagener family. The Wageners had extensive holdings up and down the Bushkill both within and just outside of Easton.<sup>3</sup>

Land along Lehicton (Bushkill) Creek was among the first purchased from the Penns by land speculators both before and after the infamous 1737 "Walking Purchase." In 1738 Moses Tunda Tatamy, a Lenni-Lenape, was granted 315 acres in northern Forks Township by the Penn family for his services to the proprietors during the Purchase. Two adjoining tracts, each 500 acres, were

purchased by Dr. Thomas Graeme. Two years later William Allen, who owned most of the land which now comprises the cities of Allentown and Bethlehem, purchased 500 acres just downstream from Graeme's holdings. Samuel Powell purchased 500 acres north of Graeme's property in 1740. John Lefevre purchased 368 acres north of Tatamy's - most of what today is Stockertown - from William Allen.

A tract of 1,000 acres at the confluence of the Lehigh and Delaware was set aside in 1735 for the private use of Thomas and John Penn. In 1750 William Parsons and Nicholas Scull, Surveyor-General of Pennsylvania, were dispatched to survey a site for the town of Easton. They completed the task in two years, at the same time that political considerations led the Penns to convince the General Assembly to erect Northampton County from the northern and eastern sections of Bucks and Berks County. Not surprisingly, Easton was selected as the county town, and as such, would be the center of local government, assuring its growth.

By the middle of the eighteenth century, Pennsylvania was the breadbasket of the colonies, leading in the production of grain, and exporting large quantities to other British colonies, both on the continent and in the West Indies. The prime cash crop grown in the fertile limestone soils of the colony was wheat; and the Delaware and Susquehanna River systems made transport for trade feasible. Easton, close to both Philadelphia and New York and on the Delaware River, became a market center not only for Northampton County, but also for Warren and Sussex Counties in New Jersey.

Although the limestone valley north of Easton contains very little surface water, the ground concealed an extensive underground drainage system which fed into the Bushkill. The water power of the Bushkill Creek, which falls nearly twenty five feet in its final nine miles, was comparatively easy to harness. The combination of this evenly dropping stream with nearby prime agricultural land at a market hub set the stage for development of one of the area's economic bases - the production of flour. Industrious citizens built mills along the creek at a steady pace, beginning in 1760.

On the eve of the Revolution, the Lehigh Valley "had an aspect" according to W. Ross Yates, historian and author of a history of the valley "of a farmland emerging from a wilderness." Tax rolls reveal a preponderance of farmers, fields of buckwheat adjoined orchards, and roads were widened to accommodate wagon traffic.<sup>4</sup> During the War for Independence, the well-tended farms of the Lehigh Valley provisioned the Continental armies with their surpluses.

Visitors to the area in the late eighteenth century took note of the activity along the small stream. Passing through Easton on his travels, Theophile Cazenove wrote "the facilities for shipping provisions from here to Philadelphia, by the Delaware river, bring here the produce of the neighborhood, especially in winter, when there is snow; and some merchants (Mr. Peirsol) pay the farmers for the grain they bring, according to the price in Philadelphia, only 6 pence less for a bushel. At the present time they pay 11 s. for a bushel of wheat and 60 s., or 8 dollars, for a barrel of 180 lbs. of flour.... There are several locations advantageous for mills; in a radius of 2 miles there are 7 flour mills, each one working with 3 pairs of millstones."<sup>5</sup> Anne Royall and the Duc de Rochefoucault-

Liancourt also took note of the importance of Easton as a milling and trade center.

In 1798 John Hopkinson, a Philadelphia attorney who had appeared before the Northampton County Bar, described Easton for the readers of the Philadelphia Monthly Magazine as

a general market, to which produce of every kind is drawn from the interior parts of the country down the Delaware and Lehigh, and the numerous streams connected with those rivers.... There are a number of manufactories, of various kinds, within the borough. On Bushkill Creek, which empties into the Delaware on the north side of Easton, and over which a stone bridge of three arches is erected, are four grist-mills, four saw-mills, an oil mill, and two bark-mills, with three tanneries, where business is carried on very extensively. In the years 1796 and 1797, many thousand barrels of flour were manufactured

and transported to Philadelphia, in boats carrying from 100 to 200 barrels."<sup>6</sup>

Through the first decades of the nineteenth century Easton was the fastest growing, busiest and wealthiest town in the Lehigh Valley region. The population increased by over 40% in each of the decades between 1790 and 1830, from a total of 697 to 3529. Bethlehem, in 1776 the largest town in the valley, was outstripped first by Easton, then by Allentown, and remained exclusively Moravian. Allentown in 1830 was a town of 1544.

In March 1827 the Easton Argus printed a "puff piece" to promote the city noting: "There are 18 mills of different kinds within a circle of one and a half miles of the court-house. There have been for more than 15 years past, 250,000 barrels of wheat and rye flour per annum dispatched from the merchant mills in and about our borough... Besides which, a considerable quantity of corn-meal has been manufactures at the same mills, and a great deal of corn in grain has been sent to the same market. The consumption of rye and corn at the distilleries in and about this place, for some years past, is almost incredible." The unknown author goes on to note that the seven distilleries currently in operation had a total capacity of 600 bushels of grain a day averaging 400 barrels, all in the production of alcohol. He made this aside: "We wish, by the way, the distillers would make the whiskey better, and make less of it."<sup>7</sup> He also includes in his list of industries oil mills, clover seed mills, bark mills, carding mills, apple distilleries and tanning yards.

Millers provided the link between farmer and market. All fall and winter, when snow made the use of sleds practical, farmers from as far away as Wilkes-Barre brought grain to the mills. Two methods of exchange were available to farmers, depending on their needs and circumstances. They could engage the miller to do custom milling, sometimes advertised as country work; the miller ground their grain for a fixed toll, usually a percentage of the finished product, returning the remaining flour to the farmer. Or, millers purchased grain outright, processed the flour with additional

bolting or sifting and sold the end result, a practice known as merchant milling.

These merchants millers often established an array of commercial services and allied businesses, including distilleries, sawmills, and stores near their mills. The wealth generated by the growing agricultural-industrial Bushkill corridor provided capital to underwrite the establishment of Easton's banks and the formation of the emerging industries shaping the region in the first decades of the nineteenth century - forges, furnaces and manufacturers.<sup>8</sup>

For their part, farmers paid close attention to the market for their grain. In some years, as in 1859, they delayed bringing their crops to the mills, gambling that they'd get a better price later. To maintain a steady flow of business, some millers turned to the grain markets of New York, sending thousands of dollars in cash from Easton to the city. The normal balance of trade was upset and local banks ran low on hard currency.<sup>9</sup>

Millers were well supplied in Easton. Notices placed in newspaper by local merchants advertised everything from French Buhr and Rock millstones to loom cloth for bolting. Millstone manufacturer Peter Field advertised in 1817 that he "makes faces, sinks the irons, frames them and sets them agoing."<sup>10</sup> Other advertisements in the Easton papers carried testimonials from local millers or were lavishly illustrated.

For local residents there was sometimes a serious drawback to all the milling activity: the area's farmers derived so much profit from grain production that it was difficult to find fresh vegetables and butter in Easton markets. The problem was so prevalent that newspapers referred to it as "the old complaint."<sup>11</sup>

How were hundreds barrels of grain, flour and whiskey transported from rural Pennsylvania to the markets of Philadelphia and New York? Successful commercial navigation on the Delaware and Lehigh Rivers dates to 1727 and the introduction of the Durham boat, designed by Robert Durham of Easton. Sixty-two feet long and eight feet wide, with cargo holds three feet deep, the Durham boat was soon in use on both rivers, where unloaded, they could float in water only four inches deep. Loaded, the boats held up to twenty tons and still only drew twenty eight inches. To navigate upstream, the crew placed setting poles on the river bottom and walked up the deck, pulling against the current. The boats could also be rowed and it was possible, although seldom done, to erect a short broad sail.

Durham boats were most often used in the spring and fall. Each year, the beginning of shipping season was noted in the local papers, and for days afterwards the volume and nature of traffic on the river was reported. The following which appeared in March 1833 was typical: "On Monday the river was sufficiently clear of wood and ice to permit the boatmen to commence their summer's work, and accordingly our millers were on the alert, and in the course of the day about \$10,000 worth of flour was shipped for Philadelphia."<sup>12</sup> Many year later, a newspaper reporter remembered the "beautiful sight to stand at the 'Point' and see these boats start off in full sail from the foot of the falls".<sup>13</sup>

Timber rafts, first used during the 1740s and 50s, were also common on the Delaware and Lehigh Rivers, and transported hundreds of logs to Easton and points south, where they were brought to sawmills and cut.

Several merchants had teams of horses; during the winter they would haul grain and goods overland to New York and Philadelphia. By the 1850s millers and other merchants could also opt to ship their goods by rail to reach markets in Philadelphia and New York.

Easton's advantages as a trade center were enhanced by the construction of three canal systems which joined just south of the city. The Lehigh canal, completed in 1829, was supplemented by the Morris Canal in 1832 and the Delaware in 1833. Although this transportation system was developed to link the anthracite coal mines of northeastern Pennsylvania with the ports of Philadelphia and New York, canal boats transported their share of grain, flour, and whiskey.

Uzal W. Condit, a minister by training and historian by avocation, provides a vivid description of Easton at its height as a regional marketplace in his 1886 publication, The History of Easton, Pennsylvania:

These busy mills, these smoking distilleries, that great drove of swine, that great company of teams and teamsters, the busy Durham boats, the sixteen or eighteen hotels filled with farmers from distant farms, the busy merchants buying up the grain and dealing out their goods to the returning farmers, that great procession of teams passing up Northampton Street, sixty in a single line - all these will give us a picture of the business of Easton in those days.<sup>14</sup>

The peak of agricultural production for most commodities was reached in the decades before 1840. By 1839, Pennsylvania had been surpassed in the production of wheat by Ohio, which produced 19.5% of the nation's crop; Pennsylvania was second with 15.6%, followed by New York and Virginia.

But as late as 1850, Enos Tolan of the Carbon Democrat wrote:

Easton has always since the settlement of the country, been a great grain mart - For nearly half a century they have manufactured and sent to market about 100,000 barrels of wheat and rye flour, besides corn meal and in former times, linseed oil. The price paid to the farmers for grain was always a fair one and that, too, paid in money, not in trade, leaving it to the seller to deal where he pleased. No set of men have ever held a higher character for integrity and fair dealing than the Easton merchants and millers.<sup>15</sup>

Tolan was correct in speaking the past tense. Pennsylvania briefly regained its leading position in production in 1850, but the geographical center of wheat growing had shifted west to central Ohio. And, until the present century, the center of milling activity moved with that of wheat production.<sup>16</sup> In the decades that followed, increased acreage under cultivation in the upper Mississippi valley combined with the development of the slate, cement and iron industries in the Lehigh Valley led to a shift in the focus of economic activity and decline in importance of grain and flour for export.

The advent of the industrial revolution and diminished role of the agrarian sector slowed new development along the Bushkill Creek, although Easton continued to thrive. Availability of transportation by canal and railroad combined with vast supplies of raw materials, land, capital and technology, led to explosive growth of industry and the transformation of Allentown, South Bethlehem and South Easton into centers of heavy industry. Eastonians, very aware of the growth of commerce in the central and western Lehigh Valley, and along the Lehigh and the canal in Easton, saw the stream to the north decline as a locus of activity.

A railroad line was perceived as one antidote to this trend, providing it was connected to one of the main lines through the Lehigh Valley. In an 1890 article promoting what became the Easton and Northern Railroad, the Semi-Weekly Free Press queried:

Why has the Bushkill Valley lost its former importance in milling and manufacturing? Why is Fourth street not presenting to-day the scenes of forty and fifty years ago, when teams loaded with produce from up the Bushkill - a valley that was the pride and the boast of the country round about - blocked the thoroughfare from Bushkill street to the Lehigh?<sup>17</sup>

Perhaps the editors had read Uzal Condit's new book. A rail line, relatively late in coming, was eventually built and after considerable bickering was connected with the main routes through the Valley several years later. The railroad fostered industrial development, as hoped, but most new plants were located in the western section of Easton known as Odenweldertown, where the Lehigh Coal and Navigation Company had built a roundhouse. Taylor-Wharton, Victor Balata and Treadwell all built facilities in this area in the early twentieth century, taking advantage of the connection with main lines.

Other industries grew and flourished at several former millsites - Binney and Smith and the Williams Company both occupied sites which began as mills. The Simon Silk Mill located along the banks of the creek in 1882, the Chemical Publishing Company did business at a site at the foot of College Hill and the Easton Gas Works operated from a facility at North Front and the creek. These business depended less and less on water power; being adjacent to the Bushkill afforded no advantage. Nevertheless, the Bushkill valley was still enough of a milling center of to rate inclusion in the Tenth Census of the United State's 1895 study of the nation's waterpower, which considered it "in all respects an excellent stream for power. It is utilized extensively for grist- and paint-mills, all the best sites being occupied."<sup>18</sup>

Local farmers continued to haul their crops to gristmills along the stream during the 1880s

and 90s. Modern roadways in Forks tell the tale - most east/west streets in the Township terminate on the west at a former millsite along the creek. The canals, and later the railroads, did provide farmers with greater access to larger and new markets outside the valley at the same time the agrarian economy was being transformed by its links to manufacturing and commercial interests.

The flour mills which remained grinding in the Bushkill Valley kept up with the latest technology, introducing the purifiers and chilled iron rollers which produced fine white "patent" flour. In his survey of the mills on the creek taken in 1885, Condit noted that three - Lehighon, Kepler's and Walter's Lower Mill - used the "new process", and that Gearhart planned to install new machinery the following spring.

Bushkill Milling Company, Mann and Allshouse and the Lehighon Mills, owned by the Williams Company, operated well into the twentieth century. Lehighon Mills distributed its flour throughout eastern Pennsylvania and New Jersey, and during World War I contracted with the government to export. These local businesses occupied a position between the very small country mill and the huge mechanized factories of the midwest, where the bulk of milling was now taking place. Farther upstream, on both branches of the Bushkill, smaller mills also continued to provide custom milling for area farmers.

By 1923 only 600 of the several thousand gristmills in Pennsylvania were still active. On the Bushkill, Stocker's mill produced stone ground flour until the 1930s. Bushkill Milling Company and Mann and Allshouse were also among the last to run on a regular basis, the latter closing in 1951.

### **General information about mills**

The mills along Bushkill Creek were water powered, connected to the creek by means of a raceway, or channel. The water was either diverted from the river directly into a headrace, or stored in a mill pond to regulate the flow. In many cases a spillway led from the headrace back to the stream. This allowed the headrace to be drained for repairs and provided a safety outlet in event of a flood. Racks were placed across the top of the race to catch debris from the stream which otherwise could fall into and ruin a wheel.

At some mills, the water wheels were located inside the building, at others the wheels were outside, placed in a stone-lined enclosure called a wheelpit. After the water diverted into the headrace turned the wheel it reentered the stream through another trench called a tailrace.

The vertical distance the water dropped from the headrace to the point of impact with the wheel was referred to as the site's "head." The "fall" was the action of the water against the wheel below the point of impact. Both the head and the fall, combined with the quantity and rate of water flowing in the stream determined the power of a particular millsite.

Dams were built across the creek to consolidate or increase the amount of waterfall and head

at a site. The resulting millpond served as a reservoir from which water could be drawn as needed, and the head could fluctuate depending on the height of the pond. Dams needed to be durable - some mill dams remain long after the mill itself is gone. To arrest the power of the stream, the dams required strong foundations, watertight construction and secure attachment to the river banks. Early dams were built of wood or block of stone cut and fitted and joined with cement. Later dams were all cement.

### Oil Mills

Oil mills were part of an important industry in colonial America. Their product was linseed oil, used in making paint, preserving wood, as fuel for lamps, and as an ingredient in printing inks and some medicines. The seed of the flax plant, grown for its fiber, contains 30 - 40% linseed oil. Because they were easy to separate from the plant, and the following year's crop required few seeds, the excess seed could be pressed for this oil.

The use of specialized equipment required in the high pressure process necessary to obtain the oil generally required a mill built specifically for this process. The earliest oil mill in Northampton County was the Moravian Oil Mill built in Bethlehem in 1745. Evidence suggests that this early mill did not use water power. By 1754, the Moravians were producing oil not only for their own use, but as a commodity to transport to Philadelphia to trade or sell for cash for other goods.

In mid-eighteenth century Easton, the Lehigh Valley Paint, Linseed Oil and Color Manufactory, near 13th Street, could process up to five thousand bushels of flaxseed per year. A set of burr stones were used to crush the flax, a "double chaser" tempered the flaxseed chop, then the chop would be heated in a furnace, pressed and stored in tanks. The machinery was run with a turbine water wheel. The boiled oil was not only mixed with ground minerals for paint, but also sold to wholesalers.

### Gristmills

Early gristmills were more substantial in structure than other types of mills in order to withstand both the elements and the constant vibration of wheel and grindstones. They were generally two or three stories high and contained the large wooden gears and shafts, as well as the grindstones, bins, hoppers, and sifters.

Being an organic material, grain is highly flammable; fires were a constant threat. Flour dust was everywhere, and the fine powder was highly flammable. For this reason, extra precautions were taken in construction of grist mills - there were many windows, no fireplaces and equipment was designed to keep friction at a minimum.

Millstones came in pairs, and a mill might contain one or more sets. In the beginning, the



large millstone, five feet or more in diameter, would be made of local stone. Later smaller stones, composed of separate blocks of buhrstone, imported from France were used. These blocks were fitted and cemented together, bound with iron hoops and backed with plaster of paris.

The lower stone, called the bed or nether stone, was stationary, embedded into the floor of the mill, while the upper stone or runner, carefully balanced, revolved. The two stones did not touch each other during the grinding process. The friction, had they touched, would have generated enough heat to damage the stones, the grain, and present a fire hazard. Instead, the face of each stone was cut with a pattern of furrows radiating from the center of the stone. Early stones had a sickle shaped pattern; later stones were cut with straight lines.

These furrows served several purposes. As the grain was poured from a hopper in a steady flow through the center or eye of the upper stone it would land on the face of the lower millstone. The edges of the opposing furrows would meet as the stone was turned and sheared open the outer husks of the grain, pulverizing the meal. The distance between the stones could be adjusted for different kinds of grains. The furrows then channelled the ground flour toward the edge of the lower stone. Finally the furrows also allowed air to pass over the stones to carry off the heat generated from the friction of the grain. A wooden casing, called a vat or hoop, surrounding the stones caught the meal and guided it into a chute leading to bins.

Additional sifting or "bolting" was necessary to separate the flour from the husks, either with a metal or cloth, often silk sieve. The more the flour was sifted, the finer the grade and the more commercial the end product.

To prevent coarse flour, mill stones were kept in good condition, which meant resharpening them often, as frequently as once a week. Workers would dress the stone, deepening and sharpening the furrows and leveling any high spots which had developed on the face of the stone. To do this, the upper stone would be raised, turned over and laid on the floor, a task most easily accomplished with the use of a crane but sometimes done with simple manpower.

Milling with winter wheat followed this traditional "low and fast" grinding process, which produced the maximum amount of flour with only one grinding. Because of the composition of the wheat berry, this method mixed the outer husk, the gluten, the endosperm and the oily germ together in one mass. Several drawbacks were endemic to this approach - the oil turned the flour rancid after a very short time, the hard bran, crushed, discolored the flour, and the gluten, prized for its strength was incompletely ground and often bolted out of the flour completely as "middlings."

The new spring wheat's characteristics exacerbated these problems and inventors and engineers set out to change the milling industry.

To use more of the middlings, the "New Process" was developed in the mills of the Midwest from ideas first put into practice in Europe. In essence, the middlings were sieved from the mass, graded by additional sifting, and exposed to blasts of air, which removed the lighter particles of bran.

The clean middlings which remained were reground to produce a fine white flour, which became known as "New Process" or "Patent" flour. Now in addition to being ground and bolted, wheat was purified.

The next technological change also had its roots in European milling practices. Hungarian millers had found that the hard wheat native to their area wore down millstones too rapidly. Consequently, they abandoned stones completely, developing rollers made of various material. With the addition of a belt drive, and a device to keep the rollers perfectly parallel, and the replacement of porcelain with chilled steel, rollers supplanted stone for grinding middlings. By the end of the 1870s, most large mills in the United States used smooth rollers for some operations.

Corrugated rollers were then found to be well suited for the first grinding, and stones were replaced with a mechanism which required less space and power but increased flour yields.

### Water Wheels

The large wheels we now associate with mills were largely used in gristmills. They either operated the mill equipment directly or were connected to a series of gears, shafts, pulleys, and belts which constituted the power train. By installing a system of large and small gears, the miller could turn the millstones up to one hundred times a minute while the water wheel turned only six or seven.

There were several different wheels in common use:

#### Undershot Wheel

A vertical wheel, this device consisted of paddles attached to the main wheel, and was powered by the water flowing underneath. This type of wheel worked best in the shallow water of running streams or close to a falls; a dam was not absolutely necessary. However, this design utilized only about 30% of the power of the flowing water.

#### Overshot Wheel

As the name suggests, the overshot wheel turned by water flowing over its top. A series of wooden troughs along the perimeter of the wheel called buckets caught the water as it poured out of the headrace. The weight of the water in the buckets turned the wheel forward. This wheel required a drop in the level of the water from high to low and was used in conjunction with a dam. Storing water in an upstream millpond allowed the flow to be regulated, providing control of the wheel. An overshot wheel harnessed about 75% of the power of the flowing water; the most efficient of all the wheel designs.

#### Breast Wheel

In this design the water hit the wheel from above, like the overshot wheel, but in the middle or about half way up. The water filled the troughs and rotated the wheel, but in a counterclockwise direction, the opposite of the overshot wheel. In periods of high water, the counterclockwise turn would move the water downstream efficiently, rather than backing it up into the wheelpit where it would interfere with the turning wheel. These wheels operated at about 65% efficiency.

### Tub Wheel

Unlike the wheels described above, the tub wheel was horizontal, rather than vertical. The wheel was encased in a wooden tub and attached to a vertical shaft. A sluice or metal tube directed an angled flow of water into the tub. This was relatively inexpensive to operate, but it required a constant flow and an eight foot fall of water. On the other hand, the tub wheel solved one of the miller's vexing problems - winter ice. The water to feed a tub wheel could be drawn from below the ice level of a stream.

### Fulling Mills

Handwoven cloth is loose and has distinct threads; "fulling" the cloth removed the grease from woolen homespun and felted the fibers, making them dense and more compact. Early residents of Easton and the surrounding area could have this done economically at a fulling mill.

A fulling mill generally contained a press, shop, dye house, tenter bars, tubs, and mallets, with a water wheel providing the power. The "fulling stocks" were composed of a wooden tub into which the cloth was placed, along with water and either soap or fuller's earth, which absorbed the grease. Two wooden mallets, operated by the water wheel, pounded and circulated the cloth. (The term fulling comes from the French verb "fuler" to walk or tread upon.) After several days to a week the cloth was removed and stretched to dry on tenter bars - long frames with L shaped nails, or tenterhooks - to secure the fabric. After drying, the cloth could be "teased" with teasel thistles to produce a nap, or dyed in the dyeing house.

If the fulling mill also contained a power-driven wool carding machine, the shop would be called a wool factory. By 1830, a circular fulling machine had been invented which shortened the process considerably. Later, as the factory system for producing fabric evolved, fulling became just another step in processing cloth.

### Sawmills

Each spring throughout the first half of the nineteenth century local newspapers reported the opening of the Delaware River to timber rafting and noted the numbers of timber rafts passing each day. Much of the lumber went to the shipbuilding yards of Philadelphia, but some was milled in Easton. The season was generally about four weeks, during the spring freshets. For the first two weeks nearly all rafts were sawn lumber and during the last two weeks mostly of log. "In early 30s it was not uncommon for two thousand rafts to pass down the Delaware during a favorable flood of

water." Rafting on the Delaware reached its height from 1840 to 1845 and began to decline about 1855.<sup>19</sup>

Up to five times as productive as hand sawing, sawmills were common along the Bushkill. Early mills were nothing more than a shed covering a water powered saw. The sawmill operated with a long, low version of an undershot wheel called a flutterwheel - the noise it produced when rotating sounded like a fluttering bird. These wheels were quite small and revolved quickly; a six foot fall of water could turn a flutterwheel 100 times a minute. The motion of the wheel turned an axle attached to a connecting rod or "pitman." The pitman, in turn, was attached to a long saw blade set in a sash.

Turning the flutterwheel caused the pitman to raise and lower the sash. A lever attached to the top of the sash ran over the log carriage. The motion of the sash caused the lever to move a notched wheel, also attached to the log carriage. Ratchets on the log carriage meshed with the cogs on the wheel, moving it slowly forward, into the frame of the sash and the moving saw blade. Waterpower was also used to return the log carriage to its original position. Later improvements added blades to gang saw an entire log at one time.

### Tanneries

Leather produced in Easton was cured at various tanneries in the region. Water powered mills played a part in this process as well, for the tanning element used in curing leather was obtained by grinding hemlock, chestnut or oak bark into a coarse powder at bark mills. Tanneries themselves were often located along a stream or creek, for significant amounts of water were necessary to soften hides. Skins, soaked for days in the stream or in vats, were thrashed on a hide machine and pounded in order to make them pliable enough to remove the hair. At the same time the hides were fleshed, or scraped from beneath to remove the last vestiges of fat and tissue.

To tan the hide, the clean hides were placed in a vat with fresh water and layers of bark. Every so often the hides would be turned, but tanning could take up to a year. When completely tanned, they would be washed and pounded to compact and compress the leather.

### Clover Seed Mills

Clover mills were established in response to the need for clover seed. Clover was an important legume promoted by early agricultural societies as a soil conserving crop, planted in a rotation with grain. By the late eighteenth century, clover was being grown commercially and by 1825 seed had become an export commodity. When combined with lime or gypsum, clover yields were especially high. Good covers of clover or grass supported larger number of livestock, increasing the farmer's income.

### Lime Kilns

Underlying the soil in the area of the Bushkill Valley are several bands of limestone. Early residents found several uses for this resource. Many of the stone buildings and bridges in the area were mortared with lime. Farmers quarried for limestone on either their own property or nearby during the off season. The stone was burned over wood and later anthracite coal, and used to fertilize fields, a practice followed about once every five years by early area farmers. Early maps of the area indicate that there were limestone kilns (marked by "LK") along the Bushkill Creek in Forks Township, and a 1939 census lists about twenty abandoned limestone quarries, most along Bushkill Creek, and two abandoned limonite mines in the township. Lime was also burned and sold commercially.

Harvey Morgenstern, writing in This I Remember, recalled a line of kilns just above Devil's Cave along the creek. "The stone was dumped over a hot fire of wood, and the result after many hours was lump lime, which had to be 'slaked' with water to prepare it for use, mixed with sand for plaster and mortar. For rough coast plaster, dog hair was added to the mixture of water, lime and sand as a binder. The hair came in bundles, badly tangled, and had to be beaten out. On more than one occasion I sat on my haunches with a four-foot plastering lath in each hand beating until it was uncoiled," he wrote.<sup>20</sup>

### Distilleries

Transportation of grain was expensive and difficult in the late eighteenth and early nineteenth century; many area farmers chose to liquify their crop at a distillery, often built adjacent to the local mill. Distilling became a thriving area industry. In 1846 the annual report of the Delaware Canal shows that 584,247 gallons of whiskey were shipped from the Lehigh Valley to Bristol, while only 27,748 bushels of corn made the same trip.

Distilleries located along the Bushkill included Herster's, Barnet's, (the area along the creek at 13th Street was popularly known as "Hogtown" for the pigs that fed on the refuse from the works) Yohe's, Thompson's, Hartzel's and Michler's; Here farmers could bring corn to be cleaned and coarsely ground. One bushel at a time would then be mashed in a small wooden tub, mixed with water and a small amount of rye meal and scalded with the addition of fresh hot slop from a previous distillation. This mixture, about the consistency of a thick pudding, would sit for a day - souring - and then stirred or "mashed out." To hasten the conversion of starch in the grain to sugar for the yeast to act upon, barley malt might then be added.

After this heating and cooling the mash would be poured into a fermenting tank and mixed with yeast, which fed on the sugar to produce alcohol and carbon dioxide gas. The fermenting liquid, called distiller's beer, remained in the vat from between seventy two to ninety six hours at a temperature of about seventy five degrees.

The fermented beer was transferred to a still, set in a furnace and heated over an open flame. Vapor from the heated beer rose into a spiral of copper tubing, the condenser or "worm", which was

chilled by cold water. Locating one's distillery near a creek or spring therefore was a great advantage. Distillate from the vapor would carry varying amount of solid matter, alcohol and water; liquid from the middle part of each run contained the most alcohol. This liquid could then be distilled again perhaps through a second still or doubler to produce whiskey.

Distilling was a risky business - stillhouses burned, a cooking pot of fermented mash might boil over or explode, and difficult to control temperatures could ruin bushels of corn.

Whiskey was used not only for drinking, but also as fuel - whiskey mixed with turpentine was burned in lamps until later replaced with coal oil. The spent stillage was used as stock feed, and most distilleries also kept several pens of hogs as a sideline.

Not everyone supported the industry. Colonel Thomas McKeen, President of the Easton Bank between 1827 and 1851, did not approve of alcohol and made it extremely difficult for local distillers to borrow money. They solved the problem by banding together in 1851 and forming the Farmers and Merchants Bank, later the First National Bank of Easton, but also known as the "Whiskey Bank."

There were other objections to the distilleries. The following open letter from "Citizens" appeared in the Easton Centinel in 1851 in response to a proposed in-town distillery:

Everyone who is in the least familiar with the distilling business knows that it is necessarily exceedingly offensive a considerable distance from the point at which it is carried on. Some of the products are offensive to a degree almost beyond endurance so that a traveler passing is apt to apply whip or spur as well as to pinch his nostrils. Pig pens crowded with their occupants gives off another perfume which in no way removes the edge of the sour exhalations already referred to.... The region along the Bushkill a mile or more from town has long been devoted to distillery purposes. This is the first attempt to locate such an establishment near the town.... The very position of the thing will, moreover, cause loads of this same liquid and sour swill to be carted through our streets and dropped at our doors.<sup>21</sup>

In his 1885 description of the Bushkill Creek valley, Condit noted that at one time there were at least six distilleries which could consume one thousand bushels of grain daily, producing four gallons of whiskey to the bushel. If they were run constantly, these distilleries were capable of producing 28,000 gallons per week or 1,456,000 annually. If sold at an average price of 30 cents per gallon, Condit estimated that the distilleries could gross \$436,000 dollars per year. Most distillers made far less.<sup>22</sup> The price also fluctuated, depending on the market and the difference between summer and winter markets.

The majority of distilleries in the region were dealt a fatal blow with the imposition of a Federal tax on whiskey during the Civil War. Taxes had been placed on manufacture of alcohol before, most notably in 1791 (resulting in the Whiskey Rebellion in western Pennsylvania) and during

the War of 1812. Between 1817 and 1860 however, the industry grew unhampered by Federal taxation. The Civil War interrupted trade in alcohol; Federal expenses led to the establishment of the Internal Revenue Service and a tax of .20 per proof gallon. The tax was raised to \$1.50 in 1864 and \$2.00 in 1865.

At the time distillers spent 40 cents to distill a gallon of whiskey. The market wouldn't support a price higher than \$2.10 and In 1865 the Easton Argus noted that one of the Easton Distillers lost \$20,000 in the manufacture of whiskey the previous year.<sup>23</sup> Consequently the local legal production of whiskey ceased.

## **Transportation along the Bushkill**

### Easton and Northern Rail Road

Although Easton was well connected with points east and south, and roads through the Lehigh Valley led to the west through Bethlehem and Allentown, before the late nineteenth century, the Bushkill Valley was linked to this hub by only a road paralleling the creek.

As early as 1860 Easton businessmen were exploring the possibility of building a railroad which would connect the northern areas of the county with the main line which ran through the Lehigh Valley from Allentown to Easton. One group, the Easton and Nazareth Railroad Committee commissioned an engineer to examine the feasibility of running a line from Easton to Nazareth.

In his report, the engineer concluded that the only practical route would be up the Bushkill's "narrow and tortuous valley." The route he proposed began at the intersection of 3rd and Delaware and ran past Barnett's, Thompson's, Uh's, and Michler's distilleries before branching out to Nazareth by a side valley. Not all property owners were cooperative; the author wrote that the proposed route at Michler's Distillery had been located "more with a view to accommodate that gentleman than to occupy the most eligible ground for a Railroad."

The line was estimated to run 9 1/2 miles and cost \$127,120 to construct. The consultant warned that construction should only be undertaken after a careful consideration of traffic and trade.<sup>24</sup>

When Uzel Condit wrote his History of Easton, a rail line was under construction. The northern terminus was not Nazareth, however, but Ashland, above Stockertown. This line began at 6th Street, and ascended the Bushkill Valley, eventually connecting with the Bangor and Nazareth Rail Road. "The intention of the company" he stated, "is to extend the road to Scranton in the not distant future."<sup>25</sup> The issue of where the line would connect with the Lehigh Valley Line in Easton was not yet decided and was apparently a topic of some discussion. Morgenstern recalled hearing a similar story. He related that the Lehigh Valley Railroad wanted to run track from south Easton along 3rd Street, but that this was met with strong opposition. Then the LVRR proposed to bridge the Lehigh at 6th Street and tunnel to the rear of Mount Jefferson.

This short line to Belfast commenced operations late in 1890 with a special opening day run to Nazareth. The rail line received extensive coverage in the local papers, the Easton Express calling it an "important and very much desired acquisition to the many railroad advantages of our city and county," and reported on the line's first run:

The formal opening of the Easton & Northern Railroad took place to-day. A special train, consisting of three Bangor & Portland coaches drawn by a Lehigh Valley locomotive, left the cemetery bridge at precisely 12 o'clock with about 200 invited guests on board. As the train stopped at the silk mill to take on Mr. Herman Simon, the whistles of the mill were blown in salute. A second stop was made at Kepler's mills, where Mr. Kepler was taken on board, and the train then proceeded to Nazareth, the terminus of the road, reaching its destination after a run of 25 minutes including the two stops. All along the road the farmers waved handkerchiefs and hats in salute as the train swept by.<sup>26</sup>

When the regular schedule was established, trains left five times a day and stopped at the following stations: Kepler's, Walter's Lower Mill, Walter's Upper Mill, Zuck's, Newlin's, Tatamy, Stockertown, and Belfast. There was a turntable for the locomotives along the Bushkill opposite the present site of Easton Iron & Metal. As Morgenstern remembered "They had good passenger and freight business. Except by horse and buggy, it was the only way to get to Bangor and intermediate points."<sup>27</sup>

Several years later, the Lehigh Valley Line acquired a controlling interest in this short line, anticipating the demand for roofing slate from the area above Easton. Directors of the line were seeking commodity traffic to offset their losses in the increasingly competitive anthracite coal transport market. For their part, the members of the newly formed Easton Board of Trade, represented by H. G. Tombler, sought to open up additional parts of the city to industry. The much debated link with the Lehigh Line, which ran above 13th Street passing through west of Odenwelder, led to the industrial development of that part of the city.

### Trolley Lines

Operation of electric rather than horse drawn street cars in Easton began in January 1888, with a line running from the foot of College Hill up to the intersection of Cattell and High Streets. Morgenstern relates the account of the first and most serious accident on this line, when the hand brake failed and a descending car, cable retarder detached, ran to the bottom of College Hill. Derailed at the curve on Third Street, the car smashed through the rail of the 4th Street bridge and fell into the Mann and Allshouse millrace.<sup>28</sup>

The Northampton Transit Company, more commonly known as "The Hay Line" after the Hay family, was formed from the consolidation of the Easton and Nazareth Street Railway Company and the Easton, Tatamy and Bangor Street Railway Company. The common junction for transfers along these lines was at Tatamy.



Until 1911, electricity for the Easton portion of the line was supplied by a power generator located along Bushkill Creek, near Walter's Upper Mill when the company began purchasing power from local public utilities.

The Hay Line developed and owned Bushkill Park, along the line beyond the city limits of Easton, which provided additional revenue in the summer months.

### **The Mills of the Bushkill**

A short description of most of the mills which at one time operated along the Bushkill follows. The narratives are arranged by mill, ascending the creek, from its confluence with the Delaware, through Easton, along the boundary of Forks and Palmer Townships and up into the outlying areas of the county. Historical records for those mills closer to the center of Easton are plentiful - this abundance diminishes as researcher "travels" north. Many of the saw and grist mills along the Bushkill and its tributaries north of the Jacobsburg area are often noted in the record only through deed transfers and maps.

Other industrial sites are included, most because the water power of the Bushkill was the primary motive for the original location of the business.

#### Mann and Allshouse Lafayette Mills - 3rd and Delaware Streets, north side of Bushkill Creek, Easton

The mill closest to the Delaware on the Bushkill was located at 3rd and Delaware Streets. The property was granted to John Brotzman and John Herster in 1789 by John Penn the elder and John Penn the younger. Herster, a native of Easton, had opened a store on Fourth Street in 1786. Prospering, he moved to larger facilities on Northampton Street above Fourth and became one of the town's leading merchants.

Brotzman and Herster cut the road up the left bank of the Bushkill from the Third Street Bridge and beginning in 1800 built flouring, oil and saw mills on the site. The property passed through several hands over the years - to Jacob Mixsell, who built a stone addition in 1810, to Enoch Green in 1842, then, for \$9000, to Isaac N. Carpenter, who in 1868 sold the property to Mann and Kieffer of Mt. Bethel for \$20,000. By 1885, when the business was known as Mann and Allshouse's Lafayette Mills, only the flouring mill remained intact.

The capacity of the mill in 1885, as described by Uzal Condit in The History of Easton, Pennsylvania was fifty barrels a day. "The old method of making flour is still used, and excellent work is done," he noted.<sup>29</sup> There was a nine feet fall of water.

In 1908, Mann and Allshouse purchased property at the 3rd Street Bushkill bridge and began construction of a dam at the foot of Bank Street. They had also acquired the south side water rights previously owned by Charles Groetzinger, now retired, which gave them rights to the entire creek from just above the Bushkill Street bridge to Bank Street. Their old dam was opposite the abandoned Groetzinger race while their race led down the north side of the stream to the grist mill below. The new cement dam was to be about seventy feet wide and seven feet high; it was hoped that the water level behind it would be raised high enough to cover the old dam and flood the now dry and unhealthy waterway which had led to Groetzinger's mill.<sup>30</sup>

Morgenstern remembered the Mann and Allshouse operation as one of the largest along the Creek. Helen Mann Hallman, one of the last owners of the mill, grew up in a house on Cattell Street, just above the mill property. Her grandfather, Levi Mann lived nearer the mill, as did members of the Allshouse family. She recalls being fascinated by the mill wheel as a child; she and her sisters would push each other around the mill, perched on forklifts stacked with flour. Farmers from Forks and South Easton would bring grain to Mann and Allshouse, it would be milled into "White Lily" flour and sold locally. Mrs. Hallman "can still remember my father taking me in the horse and buggy around when he went to collect bills and take orders"<sup>31</sup> at many locations outside of center city Easton.

Mann and Allshouse, being the first mill above the Delaware, would flood each time the river backed up the waters of the creek. Mrs. Hall recalls her grandfather rowing out of his home from the second floor; the waters would come up so fast her family could lose thousands of dollars overnight.

In 1951 Georgie Chidsey wrote "Have you ever gone to the picturesque stone mill at the foot of College Hill, that has just closed, after having operated since the Penns granted the first owners of the property in 1789?... I was impressed with its quaintness when I stopped last winter for real buckwheat flour, - the great high, old-time desk and tall wooden stool were quite different from the comfortable modern office furniture".<sup>32</sup>

The mill was sold, then demolished. The race was filled in following the flood caused by hurricane Diane in 1955. Today, a car wash occupies the site.

Groetzinger's Mt. Jefferson Mill - Between 4th and 5th Streets, on south bank of Bushkill Creek opposite Goose Island near Bushkill Street and bridge over the Creek, Easton

The first mill on this site was a saw mill built in 1762 by Peter Kichline just downstream from his gristmill on the other side of the creek. These two mills were the earliest built in the city of Easton along Bushkill Creek. Kichline, a stone mason by trade, was born in Germany in 1722. The Kichline family emigrated to America in 1742, and his father, also Peter, was operating a tavern in Easton by 1755. The younger Kichline was elected captain of his company in the Pennsylvania militia during the Indian uprising along the frontier, and he was later elected Sheriff of Northampton County. Because he was not allowed by law to keep at tavern, he opened a gristmill and a sawmill along the Creek. His mills, being the only two in the area, prospered.

In 1829 or 1830 Peter Ihrie constructed a second mill on this site, replacing Kichline's. Operating as a fulling mill, it was augmented by a wool carding business purchased by Ihrie from Benjamin Hines; both proved unprofitable. Ihrie died in 1833 and ownership of the mill passed to his son Benjamin. At this time, the mill had been converted into an oil mill for the production of oil from flax seed. Obtaining sufficient flax seed for the business became difficult and the mill was eventually converted to use as a grist mill.

The island in the middle of the Bushkill here became known as Ihrie's Island and must have been considerably larger than the land that remains today. In 1821 and again in 1844 Eastonians held their 4th of July celebrations on the island.

Benjamin Ihrie sold the mill to Adolph Groetzinger, an immigrant from Goetling, Germany who had settled in Easton. Trained as a baker, Groetzinger later turned to milling and operated Ihrie's site as a flouring mill. Under Groetzinger's ownership the business was known as the Mount Jefferson Flouring Mill. In 1885 Condit described the mill as having four run of stone and a five feet fall of water. Thirty thousand bushels of grain were ground annually using the old process.<sup>33</sup>

Upon Adolph Groetzinger's retirement in 1879, operations at the mill were supervised by his son Charles, born in 1847 and educated in Easton's public schools and at Nazareth Hall. He had worked with his father learning the business since 1865. Charles, an active member of the Easton community, ran the mill until 1907; he died ten years later, and the mill was abandoned.

#### Butz's Flour, Grist and Planing Mills - North side of Bushkill Creek at 6th Street on Bushkill Creek, Easton

Peter Kichline's second mill, a grist mill, was built in 1762 just upstream from the saw mill. Upon Kichline's death the property passed to his son Andrew who had been operating both mills. The Butz family acquired the mill from Andrew Kichline in 1800. Christian Butz, who had moved to Palmer as a child, married Mary Wagener, a daughter of Daniel Wagener, owner of a large tract of land on both sides of the Bushkill. They lived in a small log cabin on the bank of the creek opposite the mill before building a large brick home still standing when Condit described the area in 1885. In addition to operating the mill, Butz managed a large farm in Forks Township, and was a well known citizen of Easton.

The mill became part of Butz's estate when he died in 1821 and passed to his son David. David Butz was born along Bushkill Creek, learned the miller's trade, and eventually became the owner of two prosperous farms. Upon his death in 1827 the grist mill, with attached corn mill, storehouses, barn and wagon house was sold by Captain Daniel Butz to his brother Michael Butz. Michael, born in 1796 and sent to Doylestown to complete his education, returned to Easton in 1812 to work at the family mill. In 1818 he and his brother Jacob started a store which they ran in conjunction with the mill.

The two also began a woolen manufacturing business called Satinette Manufacturing in 1837, adding a fulling mill, dye and drying houses and power looms as part of the operation. A local reporter who visited the large brick building was impressed: "Everything is done on a large and splendid scale", the business was "one of the finest in our neighborhood."<sup>34</sup> After six years and considerable losses, they abandoned the textile venture, converting the mill into a gristmill. Several notices in Easton papers during the late 1840s instructed that debtors check their accounts at the J. & M. Butz Store or at the Bushkill mill.

At 5:30 a.m. on Sunday, January 24, 1861, the grist mill burned, completely destroyed along with the grain and machinery. A frame plaster mill which adjoined the stone building was also consumed. The loss was estimated at \$10,000, only half of which was covered by insurance. By March, Butz had rebuilt the plaster mill, and had begun work erecting a new grist mill.<sup>35</sup>

Business was good; early in 1865 the Easton Argus reported that large quantities of grain were being brought to Easton - "more than the millers care about receiving. As many as 40 sleds were waiting at Butz's mill at one time to be unloaded."<sup>36</sup>

Butz retired from the store in 1868 after fifty years of business; he was active at the mill until 1870. His sons Jacob and Daniel were becoming more involved with the lumber interest of the family.

"The mill pursues the old method of making flour", noted Condit in his History, "There are three run of stone, twelve and a half feet fall of water, and can produce fifty barrels of flour per day. There is a large planing mill standing on the same property."<sup>37</sup>

The Butz family's holdings were an illustration of a merchant milling operation expanding to include other businesses, in this case all located on the neck of land created where the Bushkill made its first turn to the north.

#### Butz's Planing and Saw Mills

The planing mill was located on the site of Kichline's old gristmill. The original mill had been replaced by another flouring mill which was partially destroyed by fire. The planing mill was erected using the shell of the older mill, but it too burned in the summer of 1871. At the time it was being used by the J. E. Stair Company, another woodworking business in the area, and in addition to the machinery, contained finished doors, window sashes, and flooring.<sup>38</sup>

The business was rebuilt beginning the Monday following the fire and in 1876 consisted of a three story brick building, each floor measuring 30 by 33 feet, with new and improved machinery. It specialized in the production of planed wood and millwork, including sashing, blinds, doors, scroll sawing, molding and mortising. They had on hand hemlock, pine flooring and siding.

Hardwood logs for these mills were floated down the Delaware to Easton, where teams of

horses from Butz's mill, equipped with drag chains would haul the logs out of the river and pull them across town to the planing mills.

By late in the century the entire area west of the Bushkill Street bridge south of the Bushkill in the bend in the creek was popularly known as "Stairtown" after the Stair mill. A street on the grounds was known as Butz, then Stair Street.

Late nineteenth and early twentieth century Sanborn Insurance maps illustrate several changes in ownership of properties in this area. In 1885, the gristmill was known as the Henry E. Hawk gristmill, and was flanked by the Butz's saw and planing mills. By 1892, this location was the site of one of C. K. William's soapstone mills; the planing mill was owned by Edward Butz and the saw mill had disappeared.

Twelve years later the 1904 edition of the fire insurance maps tells us that the Stair Mill was now the Young Planing Mill. C. K. Williams had continued to expand, operating a rosin and soda manufacturing facility on the site of the old Butz planing mill adjacent to the soapstone mill. The races which ran from the Bushkill to the old mills were still in use. An anomaly appears on the 1911 maps - E. M. Butz Planing Mill resurfaces, attached to the Young Mill, downstream from its original site.

The Williams Company added buildings and changed the use of this site over the next two decades. For a period of time the site was occupied by the Paper Makers Chemical Company, operated by Charles K. Knight. Knight, born in England, had come to Easton in 1900, and became associated with the Williams company. His family was active in the clay importing business. The Paper Makers Chemical Company took over his father's interests, renamed this company The Paper Makers Importing Company, and was by the early 1920s the largest American importer of ball and china clays. The Paper Makers Chemical Company also manufactured other chemicals used in the paper and allied industries. A fire in 1924 completely destroyed the building used to make "paper white" a glazing used in manufacturing coated paper. At one time the largest business of its kind in the world, Paper Makers operated plants in Michigan, New York, Massachusetts, Wisconsin, Florida, England and Canada, producing refined resin, turpentine and other products from over 200,000 acres of pine forests owned in the south, upper midwest and Canada.

Later a soap powder factory, manufacturers of "Target" soap occupied this area.

#### The Wagener Mills - Bushkill Creek and Bushkill Drive between Cemetery Bridge and Dietrich Road, Easton

The Wagener (or Wagner) family's association with Easton began in 1773, when David Wagener, born in Silesia, Germany and raised in Philadelphia, purchased a large tract of land, totalling 65 acres, along both sides of the Bushkill Creek. An active and prominent citizen, he served as associate judge of Northampton County from 1791 until 1796, and afterwards was known as "Judge" Wagener. His son Daniel, born and raised in Easton, served for thirty-nine years as a judge in the

The next generation included David O. Wagener born in Easton in 1792. A lifelong Democrat, he served as a member of Congress for four terms between 1832 and 1840, and from 1852 until his death in 1860 as president of the Easton National Bank.

His son, John O. Wagener (1832-1900) founded the firm which bore his name, pioneering in the manufacture of soapstone and "mineral pulp" products. Like his father, John Wagener was active in banking. In addition, he controlled extensive real estate, including quarry tracts, and farm and city properties.

His only son, David D. Wagener, was born at the homestead in Easton in 1859, and graduated from Lafayette College as a member of the class of 1880. Following graduation, he joined the family business, organized under the name John O. Wagener & Company, and managed the family farm. Under his direction, the farm, which now totalled 500 acres, prospered, producing award winning fruit and high grade beef cattle. He organized the two primary family enterprises into two companies: D. D. Wagener & Co. ran the farm operations and John O. Wagener & Co. a soapstone product firm.

Over the years, the Wagener family owned and operated a series of mills along this section of the Bushkill, the center of their extensive land holdings. The family built a fine two story brick home, opposite what was later the site of the Rinek Rope Works. By the early twentieth century, the home had fallen into disrepair. Children of Harry Morgenstern's generation all knew that the vacant two story house was haunted.

#### Old Wagener Mill - West side of Bushkill Creek, Easton

On the west side of the creek stood an old flour and corn mill, which was supposedly built by Frederick Wagener in 1775. There was also a saw mill on the site built around the same time, which stood until about 1845. This is the mill which Judge Daniel Wagener rented when he was only nineteen and where he learned the milling trade.

#### Wagener Oil Mill - East side of Bushkill Creek above the Cemetery Bridge, Easton

Built by Judge Daniel Wagener to manufacture linseed oil, the mill was purchased for \$9,500 by David D. Wagener upon his father's death, at age 83, in 1854. The estate sale described the site as "one of the best water powers on the Bushkill. Improvement a large stone mansion house, stone mill, saw mill, saw miller's dwelling house and other out houses."<sup>39</sup>

#### Spruce Hill Mill - West side of Bushkill, below the Wagener Oil Mill, Easton

Judge Daniel Wagener built this mill in 1792 as a grist mill. Offered for sale or rent in 1840, it was described as being 70 by 32 feet and two stories high. Also on the property was a two story storehouse, two stone houses for hands, a stone barn and an excellent sawmill, along with about 50 acres of land.<sup>40</sup> The mill was remodeled in 1845 by David D. Wagener and was then considered one of the best merchant mills in the region, with three runs of stone and the capacity to produce fifty

barrels of flour or ninety barrels of cornmeal a day.

In the late 1860s the mill was run by the E. Warne Company, who advertised to farmers that "the way to make money is to get the highest prices for your grain. Those having grain to sell call and see E. Warne at the first mill above the cemetery bridge."<sup>41</sup> In 1870 Warne closed out the grain milling business and the mill was converted to a plant to grind mineral paints. It was still run by Warne when, in 1872, it burned. The fire was blamed on arsonists, although reports allowed that fire was used in the mill for roasting colors. Insurance covered most of the losses in equipment and supplies and the mill was rebuilt. It burned again in May, 1875.

By the latter part of the century there were two mills on Wagener property, a rebuilt Spruce Hill mill on the west bank of the Bushkill and Judge Wagener's new mill, constructed specifically to grind mineral paint, on the east. Several editions of Sanborn maps identify both as soapstone grinding mills although the 1885 version locates a Richard and Walters Soapstone Manufacturers on the west side of the creek, and John O. Wagener's Elizabeth Pulp Company soapstone manufactory on the east. Both were still supplied with water by races that led to and from the Bushkill. Maps from 1892 through 1919 indicate that both sites were owned by the John O. Wagener Company.

In April 1925, the older of the two mills, rebuilt on the foundation of the old Spruce Hill Mill, burned. The Express reported the next day that the structure, one of the oldest in Easton, was completely destroyed in less than an hour, the old yellow pine in the foundation being extremely dry. The mill had been closed for a week because the breaker required some repairs, and it was possible that a torch being used started the fire. Several men were inside the mill working at the time; one escaped the flames by jumping into the Creek.<sup>42</sup>

Several years later, Lafayette College, in need of light and heat for several new buildings, looked for alternatives to refurbishing a steam plant constructed in 1909. At the request of the Board of Trustee's Building and Grounds Committee, Louis T. Klauder, a Philadelphia engineer, studied the Wagener site. The ten foot rock filled dam with timber crest spanning the stream, was, in Klauder's estimation, a feasible part of a new power plant. His final plans for the site called for not only a new steam plant, but also a power house for generating electricity, which would require a new railroad siding and a tunnel under Bushkill Drive. The Trustees, acting on the recommendation of the Buildings and Grounds Committee, approved the purchase of an appropriate property. After considering several alternatives, the College bought the Wagener millsite. The deed recorded the price as \$1, but actually \$7,031.58 was paid for the land and the water rights.

The proposal had its opponents, including the Associate Gas and Electric Company, the suppliers of the College's electricity. The College proceeded with plans to build the steam plant, with the possibility of a hydroelectric plant to be added later, perhaps to prod the electric company into renegotiating its rate structure. The stock market crash of 1929 and the ensuing depression caused the College to reconsider the expense. They abandoning the entire plan.<sup>43</sup>

In 1992, the College deeded the property to the Bushkill Conservancy.

Lehighton/Williams Mills - West side of 13th Street and Bushkill Creek, Easton

The area along the bend of the Bushkill at 13th Street was the site of several mill complexes.

Following the construction of the mills at 3rd and Delaware (see Mann and Allshouse), John Herster purchased property further up the Bushkill. A distillery, flouring mill, and oil mill had already been built on the site, all of which were improved by Herster. Eventually, Herster and William Barnet had both mills and distilleries in the area. In fact, this part of Easton became known as Hogtown, because of the swine penned near the distilleries; the byproducts were considered excellent feed.

At the beginning of the eighteenth century Barnet's mill and distillery was occupied and run by a J. Hart, who advertised for wheat, corn, rye and later apples and cider, offering to pay the highest prices for the latter. This must have been a lively area, as a dramatic fire was reported at the distillery in 1834, and an explosion of a boiler containing hot slop occurred in 1849. Sixteen hogs were scalded in the blast.

About mid century, following the death of John Herster, the properties changed hands several times. In 1867 William Barnet, most likely a victim of the tax on whiskey, offered his mill, distillery, and farm for sale. For a short time part of the Barnet property was owned by Pfeifer and Nolf, who had purchased it for \$16,000 and continued operation of at least one gristmill.

The distilleries were abandoned as the profits from this business evaporated, and a paint mill was built on the property. The Easton Express visited Herster's site in November 1868 and wrote, "although the paint works were established only some twelve years ago, and then merely for the accommodation of paint dealers in this locality...they have from time to time been enlarged and improved to meet the demands of growing trade."<sup>44</sup>

In 1877 C. H. Hecht served as agent and superintendent at what now called the Lehighton Paint Mill. The mill building was thirty by fifty feet, three and a half stories high. Power was furnished by the creek through the use of a fifty horse power American Turbine Engine. The yearly capacity of the works had been expanded to produced about 10,000 tons of paint suitable for painting coal and freight cars, bridges, barns and houses. There was, according to advertising "every shade and variety of color being manufactured in oil, japan and spirits of turpentine."<sup>45</sup>

In addition to the paint business there were soapstone and talc quarries on the property, stones from which were finely ground, and bolted and shipped in carloads to the cities. There was also a bed of pure white stone resembling granite and another of green serpentine stone on the property, which held commercial promise.

The property, including the flour mill, was leased and later purchased by Joseph T. Williams and his son Charles K. Williams, who incorporated as the C.K. Williams Company in 1883. Their operation was described by Condit several years later: "Mr. Williams has three mills, a flour mill and two mills for grinding soapstone."<sup>46</sup>



A reporter from the Easton Daily Free Press described the complex as it appeared in 1892:

The proprietor has expended about eight thousand dollars in new machinery with the latest improvements ...The machinery consists of one break machine, ten sets of rollers, four run of stone; three are used for feed, one for the reduction of middlings, and one for flour packing. Water-fall twenty feet. The capacity of this mill is seventy-five barrels in twenty-four hours. The two mineral mills grind seven tons each of soapstone, in twenty-four hours, which is, in part, taken from the side of Chestnut Hill, not half a mile distant.<sup>47</sup>

Ground soapstone was used as a filler in paint, soap and paper.

These soapstone mills, initially run solely by Joseph Williams and his son C. K., served as the basis for what became an extensive business. The company developed special facilities to manufacture pulverized mineral goods - products which eventually drew from and reached a worldwide market. By 1890 they were grinding natural ores to produce such pigments as ocher, sienna, umber and red iron oxide. The company's first synthetic pigment, Venetian Red, was introduced around the turn of the century and was followed by black, brown and yellow oxides.

Fires in 1893, 1902, and 1906 did extensive damage to buildings on the site, but facilities were rebuilt and modernized after each blaze. Harvey Morgenstern, writing in This I Remember, recalled the 1902 fire, which completely destroyed the paint mill and sent paint pigments high in the air, and "decorated the entire western section of the town." Morgenstern also described the millraces leading to facilities on the site, which for "swimming purposes" were called "Little Deepie" and "Big Deepie." The smaller supplied the flour mill and the deeper, swifter race powered machinery in the soapstone mill.

Morgenstern described another feature of the Williams site:

The race to the flour mill was contained on one side by a long high bank. From there a considerable distance to the creek was a low-lying meadow. The C. K. Williams Co. surrounded the meadow with levees, ran pipes equipped with valves into the mill race. In winter they opened the valves, flooded the meadow, maybe four acres or so, and created the best skating place Easton ever had, and by the looks of things today, ever will have.

When it snowed, teams would drag wide scoops and clear the area. When the ice became rough, it would be reflooded during the night. I have seen as many as 500 persons on the ice afternoons and evenings.

A large windbreak of railroad ties was built on the far side, and on Friday nights there would be a big bonfire and band concert. There were plank seats along the east side. A frame building, heated by a big pot-belly stove, furnished a good place to warm up, rest, buy big pretzels for one-cent each and maybe have your skates sharpened. Admission was 10 cents, but if your family was a regular coal customer of C. K. Williams they got a free pass.<sup>48</sup>

Joseph Ayers, a member of the Williams family, remembered that Williams arranged for the local trolley company to display a large red circle on the front of the cars when the pond was available for skating. The trolley, of course, carried the skaters to their destination.

The stone building with the French mansard roof still standing on the west side of 13th Street and Bushkill Creek was built between 1904 and 1911, and contained Mr. William's office, lined with green marble quarried from the Schwerer property a short distance up the Bushkill.

World War I led to increased business, as supplies of pigment imported from England dwindled. By 1920, Williams was importing raw materials from throughout the United States, Europe, and the Middle East and had greatly expanded his facilities - including acquisition of the Butz millsites and buildings in the area west of the mills facing 13th Street.

Charles K. Williams continued the business his father started, diversifying into other areas. Soon, there were three mills in Easton and a plant in Allentown, mills on the old Butz property producing paper making chemicals, and quarries and mines in Pennsylvania, South Carolina, Massachusetts, California, and Florida. The company's pigments were used to color a wide variety of products - ceramics, brick, flooring, paper, rubber, plastics and textiles.

The other son, Frank C. Williams, ran the Lehighton Flour Mills, which now used the new roller process, thought to provide the best quality wheat flour. This quickly developed into one of the largest flour milling businesses in the city.

In 1962 C. K. Williams was sold to the Pfizer Company. The firm now on the property is Minerals Technologies.

Rock Mill - Mitman Road and Bushkill Creek, Forks Township just above the iron bridge at the lower Binney and Smith plant

The first mill completely outside of the city of Easton was Rock Mill, constructed of stone by George Messinger about 1756. This original structure, a grist mill, was reconstructed in 1807 by Jacob Seiple. The mill was run by Philip Odenwelder in the late 1830s, when a flood carried away the dam. Daniel Butz, acting as trustee for Philip Odenwelder advertised the mill for sale in 1841, when it was described as adjoining "the Mill tract of Herster & Barnet. The mill house, 40 by 50 feet, is first rate - 3 stories high, with three run of French Burr mill stones calculated for Grist and Merchant work and is situated in a good grain country... has one of the best water powers on the well

known stream called Bushkill." The property was also touted as an "excellent seat for a distillery."<sup>49</sup>

The mill was in fact one of the largest and most successful in Forks Township. It changed hands and names frequently, though at mid-century maps of the area show "Butz Mill" on this site.

Apparently Butz didn't sell the mill, but did rent it out, for in 1868 it was leased to Nathan Huttel, who advertised that he would put the mill in complete running order. However, the next year found the mill run by Mr. A. J. Leibert, who began grinding on February 1st.

During the 1870s the mill was owned by J. A. Gerhart, who continued operation of the grist mill through at least 1885. Gerhart was born in Bucks County in 1840, and was first employed as a mill stone builder, later becoming a miller. In 1860 he moved to Easton, and after serving in the Pennsylvania Militia during the Civil War, took up milling along the Bushkill where he worked for thirty-five years grinding grains and manufacturing French burr mill stones for other millers.

In 1885 Condit described his milling operation as including four run of stone, a new bolting chest, and utilizing the "old process" with an old-fashioned breast wheel harnessing the power of the water. The new roller process was to be introduced the following spring.

In addition to milling, Gerhart purchased property in downtown Easton and ran large cider and vinegar mill (capable of pressing 4000 gallons in 10 hours) and a mining equipment business.

Shoemakers Mill - In the area of the old Binney and Smith plant, Forks Township

Jacob Shoemaker, from Williams Township, married one of Major Jacob Arndt's daughters, Margaret, and purchased 176 acres along Bushkill Creek in 1771. By 1776 he had built a fulling mill on his property, located about two miles from Easton, opposite what is now the old Binney & Smith plant. Jacob Shoemaker operated a fulling and dyeing business on the premises until 1804 when he gave the land to his son John. The mill survived until at least 1830 when 100 pounds of ground plaster were advertised for sale "at the plaster mill formerly in possession of John Shoemaker."<sup>50</sup>

Union Mill - Edgewood Avenue and Bushkill Creek, at the old Binney & Smith plant, Palmer Township

James Thompson operated a distillery along the Bushkill at this site as early as the 1830s. The bridge to his business was washed away and the distillery suffered damage as a result of a 1838 flood along the Bushkill. The next year, Thompson added a three and a half story mill built of stone quarried in Palmer Township.

Maps from midcentury indicate both distillery and mill continued in operation, owned and operated by James Thompson and his son William, who had become his father's partner. After his return from the Civil War, William Thompson sold the property to Tilghman Kepler, employed by the Thompsons since 1858, for \$13,000. This was considered a very low price but justified in light

of Kepler's long service. By the late 1870s the building had been expanded to five stories, and housed four run of stones.

Kepler discontinued the distillery but was running the gristmill in July 1880 when it burned to the ground. The origin of the fire was unknown, as the mill was not in operation the night of the fire and neighbors reported nothing suspicious. Kepler's son, who was staying at the mill, escaped from the second floor by climbing down a rope fashioned from bed linens. Nearly \$7000 of new equipment was destroyed, and the total loss was put at more than \$20,000.<sup>51</sup>

Kepler rebuilt the mill, installing completely new machinery. When Condit visited in 1885, he saw a five and a half story mill which used the new roller process to produce sixty-five barrels of flour a day.

On September 30, 1902, Binney and Smith, a New York company with extensive operations in Pennsylvania, incorporated in Easton. They served as the general distributors of carbon black, produced from the natural gas found in the state, eventually exporting the product overseas. Edwin Binney, who traveled extensively for the company, met John Ketchum, a North Carolina businessman who was searching for a location to grind soapstone deposits he controlled. Binney may have been familiar with the Williams Company's work in Easton. In any event he recommended Union Mill, then available for purchase. Binney and Smith acquired the mill and Ketchum was put in charge. In addition to grinding soapstone, Binney and Smith workers combined scrap slate with talc and cement, ground it, and made slate pencils for use in schools. Successful marketing of this product was followed by the development of a white low dust blackboard chalk. In 1903, the first box of Crayola crayons was produced. Eight sticks - red, orange, yellow, green, blue, violet, brown and black - sold for five cents.

Binney and Smith first appears on the Sanborn Insurance Maps in 1904; at this time the Palmer facility consisted of single slate pencil factory. Subsequent maps illustrate the development of the business: in 1911 there is a color mill in addition to the pencil facilities and an old wooden bridge was replaced by a cement span. The 1919 map shows two separate mills - a lower, "black color" mill and a large upper mill now dedicated exclusively to crayon manufacturing. Warehouses and other outbuildings were also added.

The large dam currently located at Binney & Smith plant was probably constructed for Union Mill; walls of Kepler's mill were incorporated into the newer building and can still be seen on the southwestern side of the structure.

#### Walter's Lower Mill - Falls at Bushkill Park, Forks Township

Arndt's or Walter's Lower Mill was one of the oldest in the area. It was built sometime before 1760 by John Jones; the area of Forks Township around the mill was sometimes referred to as Jones' Mill. Jacob Arndt, a native of Bucks County and active in the local militia during the French and Indian War, purchased the farmhouse, the mill and 148 acres from Jones on January 25, 1760.

Matthew Henry relates that when Arndt went into Easton to get the deed to the property from Jones "he hitched his horse to one of the forest trees in the square, and attended to his business, it did not appear to him as much of a place."<sup>52</sup>

Arndt quickly became one of the most active citizens of Easton. He was commissioned a justice of the peace in 1761, and served as one of the justices of the General Quarter Sessions and the County Court of Common Pleas. When, in 1763, there was a renewed threat from the Indians in the area, he was selected as captain of a company of Forks Township residents. In 1766, Arndt was elected a member of the German Society of Philadelphia, clear indication that he was much more than a country miller. Arndt was very active in Pennsylvania politics during the Revolution, attended Provincial Conferences and serving as a delegate to the last General Assembly of the Proprietary Government in 1775. He served as a delegate to the Provincial Conference which drew up a constitution for Pennsylvania in 1776 and was elected to the first general assembly held under the new government. He also served as a member of the General Assembly in 1782 and 83. When parties began to form, Arndt became identified with the Federalists and was not reelected.

John Arndt was born in Bucks County in 1748. At the outbreak of the Revolution he was working at his father's mill. Appointed an officer in a company of 102 men formed in Northampton County, he later joined with three other companies under the command of Lieutenant-Colonel Peter Kichline. Arndt fought in the Battle of Long Island, was wounded, and in November captured by the British at Fort Washington. He returned home to the mill, his injury forcing him to return to civilian life.

Appointed Register of Wills, Recorder of Deeds and Clerk of the Orphans Court for Northampton County in 1777, Arndt held various offices during the remainder of the war. In 1787, he served as a delegate to the Pennsylvania convention called to ratify the United States Constitution.

Eventually bad health and age forced Jacob Arndt to leave the mill, and a store he established, to live in town. He conveyed the mill and the tract of 148 acres to his son, John in February 1785 for 280 pounds. John was obligated by the deed of sale to pay one third of the income of the mill to his father; in the event of his father's death, one half of that amount was to go his mother.

For many years his offices as well as the county records were located at the mill. In 1791 the state legislature passed a law requiring county officers to live within the limits of the county towns; Arndt moved to a house in Easton in March 1796. He died in 1814 and is buried in the cemetery across from Arndt's Church, on land his family provided for a graveyard.

His sons, George Washington and Benjamin Franklin and Samuel Arndt, to whom he had left the mill, and his son-in-law Charles Lombaert remodeled and enlarged Arndt's mill, installing a woolen manufacturing equipment in 1813. The economic downturn which followed the War of 1812 drove them out of business in 1817. George Arndt went to New Orleans with the hope of continuing further west. He died there of the fever, having led "an unimportant life marked with much indiscretion and misfortune."<sup>53</sup> Benjamin fared better, eventually becoming a justice in the Orphans

## Court and Justice of the Peace.

Despite John Arndt's desire, as expressed in his will, that the mill remain in the family, the mill property, termed one of the finest situations on the creek, was put up for sale in 1823, when the estate was finally settled by Philip H. Mattis, who petitioned for a special Act of Assembly to authorize him to sell the real estate.

The property was offered either in total or in two packages, one containing the stone gristmill, house and barn, along with seventy acres. The advertisement noted that an additional mill could be erected on the property, for "In addition to the Water Power now in use, and which was sufficient to keep the mill in constant operation during the excessive drought of last summer, another Power of considerable force, may be obtained below the present mill."<sup>54</sup> The second tract, eighty acres south of the Creek, would also be suitable as a mill site, the owner "need only repair an old dam, which had been erected for watering a meadow."

The earliest traceable deed reference for this property is in 1835, when Samuel Yohe purchased it from Charles Kellar. Yohe was a native of Easton, where his father had a mercantile business; Samuel continued the tradition, going into business for himself in 1828. He expanded his interests into Forks Township, as an 1851 map shows Yohe's Mill and Distillery on the Arndt site. The business was successful; Uh improved the grounds and buildings and added another mill. Yohe was also active in the political life of the area serving as Prothonotary, Associate Judge for the County of Northampton, County Treasurer and a Colonel of the First Regiment of Pennsylvania Volunteers at the outbreak of the Civil War. He also was appointed Provost Marshall, overseeing the military draft during the war.

In 1867, newly married Colonel Yohe moved to Philadelphia and offered his property on the Bushkill for sale, noting that "distilleries are not so valuable as they used to be - the heavy tax on whisky ... has used the profits up."<sup>55</sup> He sold the barn, distillery and mill to John Hagerty and Nathan Huddle (variously spelled Huddell, Huttle, Huttel) for \$20,000. They put \$4,000 down and were to take full possession in April 1868.

On January 10, 1868 the Easton Express carried the headline "Another Conflagration". "Shortly before 11 o'clock last night" the article began, "a courier rode down Northampton street at a fearful rate, crying 'Fire! Fire!' 'Uh's mill on fire!' Five fire companies responded to the alarm, but only one ran the entire distance to the mill, arriving at half past twelve. The steamer was fired up, ready to work, however, the cold had frozen the gauges, water pipes and other necessary attachments. When the newspaper reporters arrived the entire mill was burning. They described the scene:

The red flames ascended toward the sky, and, fanned by the breeze, cracked furiously; the sparks flew thick and fast, and ever and anon, as some of the heavy wood-work of the mill fell crashing to the

ground, a volume of dark smoke arose, followed by another grand pyrotechnic display of a shower of sparks, which being reflected in the dark blue waters of the Bushkill, presented a scene that our pen fails to describe. The building was a large one, built of stone, and as the flames shot forth from the many windows, their burning frames all on fire at the same time,--the snow on the hill sides reddened by the light of the burning building, the scene was one of grandeur and magnificence.<sup>56</sup>

The fire was thought to be started by sparks or heat from the friction of the mill stones operating at the time. Although an old mill on the property (perhaps Arndt's original mill) as well as several nearby buildings and homes escaped damage, several workers were injured, including the owner's son, Nathan.

The mill contained at the time between seventy five and eighty barrels of flour, ready to send to market, about one thousand barrels of corn, two thousand bushels of wheat, and about ten tons of feed. The ledger books, records, and orders in the office were also lost. Only the stone walls were left standing, and the loss was estimated at \$10,000-12,000.

Yohe sold the burned mill and property to Jacob Roder and Jacob Walter. The Walter family had settled on about 200 acres of land along the Bushkill about two miles from Easton sometime in the mid eighteenth century. By 1775 Bernard Walter owned 300 acres of land in the area. Jacob Walter, a dealer in feed, flour and grain, learned the milling trade by apprenticing to Benjamin Godshalk at the mill at 3rd and Delaware. He went into business for himself in 1848. As owner of two mills with offices in downtown Easton, he was well known throughout the county.

Walter rebuilt the mill operating it into the 1870s and 80s. An enterprising businessman, he also owned a mill at what is now Penn Pump Park; the mill at Bushkill Park was known as Walter's Lower Mill or Bushkill Mill #2.

Walter was a patron of Ellis' History of Northampton County in which he was listed as a manufacturer of "a superior quality of flour known as 'The Patent Process Flour'." Condit visited Walter's lower mill several years later, duly noting that Walter used the new process, and had five run of stone powered by a waterfall of ten feet. The capacity of the mill was one hundred barrels of flour a day.

It is not surprising that Walter had equipment for the new process installed. Sometime in the 1880s he established yet another business along Bushkill Creek, this one in downtown Easton at North Third Street where he manufactured the middling purifying machinery central to the new method of milling. Adjacent to a wood work and wood finishing shop, Walter employed six, who

worked ten hour days. It does not appear that water power from the Creek played any part in producing power for this concern. Walter died in 1890 in the house on his upper mill property.

In 1896, J.B. Overholt, a miller at Newlin's Mill, in partnership with Senator B. F. Miller and Milton Flory of Bangor, bought Walter's Lower Mill. Later Mr. Overholt became sole owner of the Bushkill Milling Company. He was interviewed by Martin Smith in the 1940s. At that time, Overholt said that he and Mann and Allshouse were the only mills along the creek which operated regularly. Overholt's two sons ran the mill; he had been blind for over eleven years, but he still came to work each day, and could tell when "things weren't running right." The mill was quite well known for its flour, but over the last five or six years milling had dropped, as local farmers were raising vegetables for truck farming, and alfalfa. The mill's primary product was animal feed. He would have preferred to continue using the old millstones, but it was difficult to find anyone who knew how to dress them. The roller process was more efficient, he admitted.<sup>57</sup> When he died the Easton Express noted "Mr. Overholt was widely known throughout the rural section of Northampton County, and gained a wide reputation for fair dealing that brought many farmers to this mill with their crops of grain."<sup>58</sup>

Dan Overholt joined his father Jacob at the mill in 1908; his brother Warren began in 1910. They were still at work in 1942 when the Easton Express visited the site. At that time, the mill produced around 7000 barrel of white flour and 2500 ton of feed grain annually for a local market. The mill, like the Williams mill, had enjoyed a substantial export business during the first World War, but those days were over. The brothers explained that the market was now within a radius of twenty five miles of the mill, shipped to by truck and the railroad. They also continued to do custom work for farmers, grinding oats, rye and barley into farm feed. According to the Overholt brothers, in addition to the distillery on the site, there had been a saw mill and a mill which ground spices, including cinnamon and pepper.

The mill dam, stone bridge, and mill race at Bushkill Park were for many years Forks Township landmarks. Today, all have been demolished or replaced, the bridge most recently, in 1985.

#### Bushkill Mill #1, or Walter's Upper Mill - Walter Avenue and Bushkill Creek, Palmer Township

Built by Michael Messinger in about 1760, this mill and the milling business were later sold to Nathaniel Michler, who added a distillery in 1825. The property passed to Michler's sons Peter and Thomas. The Michlers were another important family in Northampton County, Nathaniel served as Justice of the Peace at Jacobsburg and as a Latin teacher at the Moravian School in Nazareth. He later was appointed Register of Wills and Recorder of Deeds for the Northampton County and was Clerk of the Orphans' Court. Peter Michler was a merchant in Easton and in 1846 was one of twenty four men who founded the Farmer's and Mechanics Bank, later serving as its president. He was also the first president of the Thomas Iron Company, and had extensive interests in the coal industry in the upper part of the Lehigh valley.

A flood carried away the mill dam in 1838 and the following year another flood did additional damage. A fire in 1846 damaged both the distillery and the mill, which was being used as a residence.



The insurance coverage of \$1500 was considered "far short of the entire loss."<sup>59</sup> The Michlers had the mill rebuilt.

In 1862 the property was advertised for sale as part of the Thomas Michler estate in the Easton Argus and described as a "three story stone grist mill, forty five feet six inches by fifty six inches, a stone distillery, forty feet by fifty five feet, a Frame engine house with an engine thirty horse power strong, a grain house, twenty six feet by thirty feet, a two and a half story frame house thirty two by sixteen feet with a kitchen attached thereto sixteen by thirty two feet." Also included were a four and a half story frame house, two story house, barn, frame wagon house, frame stable, wagon house, ox pens, pig pens and other out buildings.<sup>60</sup>

The property was sold to Jacob Walter for \$12,000, who leased the mill to other operators including a Mr. Frankenfelder and a Mr. Woodring. By 1874 the mill, still owned by Jacob Walter, was known as Walter's Upper Mill.

When Condit saw the mill in the 1880s it consisted of five run of stone and was capable of grinding 100 barrels of flour a day. The waterfall across the dam was ten feet. Part of the race remains; it goes under the railroad bed west of the dam.

#### Zuck's Mill - Stocker Mill Road and Bushkill Creek, Palmer Township

The only mill close to original condition still standing in Palmer Township is Zuck's Mill. The mill was built in 1829 by the Kemmerer family after David Kemmerer purchased the property from John Lerch. He in turn sold the land to John Kemmerer. Constructed of stone, two and half stories tall, the mill began operation in 1829.

The property changed hands several times over the next two decades. John Kemmerer sold it back to David Kemmerer who in turn sold it to a George Abel who operated the mill until his death in 1861. At the time of its sale to Abel the mill property was described as "in a first-rate grain country and an elegant water power, containing two runs of burrs. Large and commodious, with merchant bolts, country-bolts and smut machine, corn-kiln, grain or storehouse, wagon house, two dwelling houses, two stables with other necessary outbuildings containing about seven or eight acres of land, in good order."<sup>61</sup>

The mill was later acquired by William Zuck who operated the business from 1869 until 1896. The small settlement which grew up in the area appears on local maps as Zucksville. Milton Frankenfield owned and operated the mill from 1896 until 1911, when he sold it to Charles Stocker and his wife. This large mill was still in operation in 1930, the miller's family housed in an adjoining home constructed by Charles Stocker. According to an article in the Easton Express in the early 1930's, "old fashioned mill stones were still grinding grain in the old fashioned way well into the twentieth century."<sup>62</sup>

In 1975 the property was acquired by the Mutschler family, who located their art and framing business "The Blue Easel" on the site. They have restored the mill, and in the process uncovered five original mill stones, two of sandstone, most likely quarried locally, and three of buhrstone quartz, the imported French burr stones referred to in many descriptions of mills.

Newlin's Mill - Newlin's Mill Road and Bushkill Creek, Palmer Township

Newlin's Mill, the northernmost in Palmer Township along the creek, was another in the series of mills built along the Bushkill by the Wagener family. Judge David Wagener, a prominent local attorney, developed several mill properties within the city of Easton and owned farmland throughout the county. To mark the construction of this mill he had the year - 1809 - carved on one of the stones in this building. The Judge supervised the operation of the mill himself for several years, then rented it out to his sons-in-law, Joseph Burke and Philip Mixell.

Following the Judge's death, the mill and 300 acres of property passed to his son Jacob, then to Mrs. E. A. Newlin of Philadelphia, Jacob's daughter and the Judge's granddaughter. It was worked by a series of millers hired by the family or its agents in Easton. In 1860 we know the mill was operated by J. A. Gerhart, who later owned Rock Mill further south in Forks Township. He advertised in the local papers as a "Manufacturer of and Dealer in Grain, Flour, Feed, etc."

Although it appears that the mill was active through the end of the nineteenth century and was popularly known as "Judge Wagner's Upper Mill," milling ceased following the turn of the century.

The mill building remained and was converted to use as a manufacturing facility. It had been occupied for about three years by the Inserting and Mailing Machine Company when it burned to the ground on February 8, 1930.

From photographs, old maps and remains of its stone walls we know that the mill was located just south of the modern Newlin's Mill bridge, below the brick home which still exists. Traces of the mill race, which ran almost to Tatamy, can still be seen today.

Messinger's - North of Newlin's Mill Road on Bushkill Creek, Tatamy, Palmer Township

There is not a great deal of information regarding the plaster, clover seed and wool carding mill built by Michael Messinger in 1815. Messinger died in 1843, the newspaper stating only that he was of advanced age. An 1841 map of the area indicates the existence of Messinger's Clover Mill. Condit visited Messinger's mill in the 1880s, noting that the former clover mill was now a flouring mill.

Woodring's Mill - West branch of Bushkill Creek, left of Sullivan Trail just south of Stockertown

According to Matthew Henry, a sawmill on this site was built by Andrew Stocker about 1785. Other sources indicate that the mill was erected by John Van Etten, a son-in-law of John LeFevre, who built a log cabin in the area in the mid 1740s and operated one of the first taverns in the county.

Van Etten, who had served as a judge of the Northampton County Orphan's Court, built a mill race and sawmill on the property in Forks Township. In 1775 he sold his land to Frederick Diehl.

In 1840 Sidney A. Clewell removed the sawmill in order to build a grist mill on the site. Peter Woodring, in 1845 the postmaster at Stockertown, subsequently acquired the mill from Clewell. In 1866 the grist mill and the barn on the property were completely destroyed by a fire of unknown origin. At the time the mill was rented by the firm of Woodring and Brinker, one of whom was sleeping in the office when the fire broke out. He was awakened when his dog jumped on the bed.<sup>63</sup>

In early April 1869, Josiah Woodring, of Bethlehem, moved to Stockertown where he had rented the "old" Woodring mill.

The mill building still remains and is today a private residence.

Friedensthal Mill - Northwest branch of Bushkill, one mile west of Stockertown, and two miles northeast of Nazareth, Forks Township

Moravians who had settled in the "upper places," north of Bethlehem in the mid eighteenth century, were far from any gristmill. If they had the means, grain was transported as far as Irish's Mill at the mouth of Saucon Creek, or to Christian's Mill, which under the best conditions had a limited capacity. If they owned no horses, families would use a hand mill. Matthew Henry provided a wonderful description of these devices:

These hand mills were made of two circular Stones, the lowest of which was called the bed Stone, the upper one the runner. These were placed in a hoop, with a Spout for discharging the meal. A Staff was let into a hole in the upper surface of the runner, near the outer edge, & its upper end through a hole in a board fastened to a joist above, so that two persons could be employed in turning the Mill at the same time. The grain was put into the opening of the runner by hand.<sup>64</sup>

In the fall of 1749 a survey was conducted to select a site for a mill closer to the farmers around Nazareth. By January, Henry Antes had purchased 324 acres on either side of Bushkill Creek (then known as Tatum's Creek) from land speculator William Allen of Philadelphia. Construction of the mill's foundation began in April. Iron work for the building was procured from the Durham furnaces in Bucks County. By August 1750 the mill, measuring 48 by 34 feet and situated on the left bank of the creek was completed and running. The mill had an overshot wheel, and one run of stones cut from a quarry in Neshaminy. The Moravians celebrated by holding a lovefeast on the second floor of the mill with bread baked from milled flour.

The gristmill was only one part of a small settlement which by the next spring included a farmhouse, outbuildings, a dairy and wells. The area was given the name Friedenstal or "Vale of Peace." The mill was busy; during the year ending June 1755, it had ground 154 bushels of wheat, 185 of rye, 42 bushels of buckwheat, and 37 of Indian corn. A road was cut from the small outpost

to Nazareth to handle the increased traffic between the two locations.

The Friedenstal economy was not always to live up to its name, however. In 1755 it was shelter for a total of 75 settlers fleeing from the threat of Indian attack during the French and Indian War. The following spring, the entire settlement was surrounded by a stockade to protect the residents. Four hundred by two hundred fifty feet, the wooden palisades was reinforced with log cabins at each corner. In 1763 the area was refortified, but by this time the threat had eased.

A succession of millers followed Antes; six different men ran the mill between 1751 and 1771. In 1758 a second run of millstones was added. The Friedensthal economy of the Moravians was dissolved in 1764, but the mill remained in Moravian hands for seven more years. Harman Loesch was the last to grind grist for the Moravians; after 1771 the mill was sold.

The original mill was razed in 1794 and a second mill built on the foundation by Jacob or John Eyerle of Nazareth. He in turn sold the property to Joel Weiss, who, by one account, turned the structure into a house. In 1845 the building was sold to Clewell and Albright. A history of the mill written in 1875 claimed that they demolished the mill, and transported the stone and timber to Stockertown, where they were used to build Woodring's Mill. This mill burned in 1866.

A portion of the race of the old Freidensthal mill may still be seen. The site was most recently occupied by the Hercules Company.

#### Upper Stockertown Mill

An 1852 county map shows two establishments on the Plainfield/Forks line - Leibert's Mill (Plainfield) and Weaver's Tannery (Forks). This was possibly the same property advertised for a sheriff's sale in 1823 when it was described as an oil mill and four lots on and near the Bushkill. This site had been granted to the Kessler family by John Herster and Peter Miller, and the Kesslers had built a grist mill and log cabin.

#### The Henry Sites at Jacobsburg and Boulton

Entire books have been written about the Henry works and the ancillary industries which supported the century long production of the Henry rifle, smooth bore musket and shotgun along the Bushkill Creek. This narrative will offer only a brief description of the three centers of activity in the Jacobsburg section of the waterway.

#### The Gun Factory

William Henry, Jacob Christ and John Jacob Eylery, Jr. (owner of the Freidenstthal mill in Stockertown) acquired 700 acres of land along the Bushkill in what was then Plainfield Township in

1790. At the time, Henry's gunmaking operations were in Nazareth, but, seeking to expand his business, he apparently found the potential of the Bushkill's power attractive. The residents of Nazareth appreciated the removal of noisy gun testing.

The village of Jacobsburg, where the first gun factory was built, was already established when Henry acquired title to the lands - there was a tavern along the well traveled Minisink road which lead through the village northeast into New Jersey and on into New York and New England. Henry located his factory on the south side of the creek, about 600 feet east of the old Jacobsburg bridge. The original dam was located about 150 feet upstream and the race paralleled the creek, about 250 feet to the south and fairly high above the bank, so that the mill building itself was about 10 feet or so above the level of the creek.

The new gunworks were completed in 1793; ten years later the mill was described as a "stone boring and grinding mill 40' by 50', three stories." This site was sold in 1813 when Henry moved his operations to Boulton (see below) and the new owner converted the building into a grist mill with three run of stones. It was operated by various owners in this capacity until near the end of the nineteenth century.

#### Catherine Furnace

In 1824 William II's son Matthew Schropp Henry, who had rented, then purchased his father's forge and barrel mill, erected the Ann Catherine Iron Blast Furnace about 700 feet due north of the original gun factory. The first blast furnace to operate in Northampton County was powered with water not from the Bushkill, but rather from a smaller tributary identified on maps only as 'small creek.' Later, most likely for more dependable power, a large dam was build far up on Sober's Creek; the race was more than 4,700 feet long, and had a fall of nearly 50 feet.

Named the Ann Catherine Furnace in honor of Matthew's wife, this was the site of the first pouring of refined pig iron in the county. The iron works produced billets for the gun factory forges as well as a variety of cast and wrought iron products, including stove plates, iron kettles and pots and pans.

Matthew Henry sold his interest in the iron works in 1833 to William Wolle and Peter Kern, who continued to operate the forge and furnace for another seven years. In 1835 this operation was described as including one blast furnace, one two-fire refining forge, one large 2-story frame house for a manager, a stone office, 13 homes for workers, two blacksmith and wheelwright shops and three large frame barns. Henry also built a large tannery, containing between 40 and 50 vats, just east of the foundry.

#### Henry's Forge

In 1809 William Henry II built a forge for the manufacture of the bar iron which supplied his original gun factory producing the first bar iron in Northampton County. The forge was along the

Bushkill about half way between the first gun factory and the later Boulton site. The traditional "blooming" process was used to produce the iron - the raw iron was heated on a hot charcoal fire fanned by bellows. As the ore heated it gradually gave up its iron, gathered by constant manipulation of tongs, in the center of the fire in a glowing ball or "bloom." The slag was worked to the outside of the fire and discarded, while the bloom was worked on an anvil or shaped into ingots for later use.

A complex of buildings grew up around the forge. In 1845, when the 135 acre property was sold by Sheriff's sale to satisfy a debt, it consisted of a frame coal house (anthracite having replaced charcoal for the fire), a large frame forge, a stone office, a blacksmith shop and other outbuildings including a storehouse, barn and stables. The property was purchased by Andrew Benade, a Moravian minister, who lived on the property for two years.

Today, the iron master's house (Benade House) and the forge office (Springhouse) remain.

## Boulton

In 1810 William Henry II secured a contract from the Federal government for the manufacture of approximately 10,000 guns. In order to fulfill the order, Henry decided that it would be necessary to expand his manufacturing facilities. He chose a location on his Bushkill property three miles northeast of Nazareth, not far south of his existing factory and forge. Henry's son William Henry III, who joined the family business in 1802, supervised the construction of a new factory, from felling and preparing the timber to erecting various out buildings. It took twenty four months to complete the complex known as "Boulton" named to honor Matthew Boulton, a business partner of James Watt and a seminal figure in the British metal trades. In addition to the gun factory, a log dormitory, and smith shop and file manufactory, annealing oven and various other buildings were erected.

The first floor of the gun factory was of stone, the second of wood studs covered with wood siding. Between the wood studs was a four inch brick wall. The roof was of slate. Floors were constructed of heavy timber, overlaid with wooden boards. Originally the building was T shaped; later the wing was removed. In the rear of the building to the north was a large dam which regulated the flow of water by means of a flume to several large waterwheels located in the center of the structure.

Two dams were built to the north to contain water from the creek, the race, dug by hand, dropped 16 feet as it lead to the factory, and turn the large wheel. The first water wheel was wooden, 14 feet in diameter with 5 foot wide troughs. It was replaced in later years by a metal wheel and finally a water turbine.

The following advertisement appeared in the December 15, 1815 issue of the Spirit of Pennsylvania, published in Easton:

Valuable water works for sale - a valuable manufacturing establishment for sale,

situated on 167 acres of land belonging thereto, about 40 acres thereof cleared and in tillage.. the principal works being a forge with three fires and double triphammers in the west wing thereof and in the east wing there is the best constructed machine for boring, for turning and grinding of gun barrels, etc. The building which is new is two stories having 84 foot front, 32 foot deep, well covered with a slate roof - one shop, 2 stories 20 x 40 feet with two fires and a file shop in the upper story, also covered with slate; 1 good (mostly New) house 44 x 26 feet suitable for a boarding house and a log house for workman .... might with little expense be made into a grist mill, as well as a rolling and slitting mill, ...being within 1/4 mile of road leading from Wind Gap to Easton and with 1/2 mile of Henry's forge. Its water works are very strong and a sufficient quantity of water - 28 ft head and fall- at all seasons.<sup>65</sup>

William III operated the Boulton factory in partnership with his brother, J. Joseph, who was a gun maker in Philadelphia. J. Joseph bought out his brother's interest in the firm in 1822, sold his holdings in the city, and moved to the Henry homestead near Boulton. In 1826 the Henrys contracted with Astor American Fur Company for "North West" guns used in the fur trade as payment to native trappers. This market for flintlocks remained lucrative until mid-century, in spite of the gradual encroachment of percussion firing systems for guns. Indians preferred the earlier firing mechanism, which did not require a supply of caps, only flint.

James Henry, J. Joseph's son, followed his father into the business in 1831; at one time his four sons also were employed by the company.

During the Civil War, the Henrys subcontracted with the P. S. Justice Company of Philadelphia, producing 1000 guns with the Justice mark. The factory produced arms and rifles for the Pennsylvania Militia under its own name. In the years following the war, Granville Henry, James's eldest son, purchased war surplus parts to use in civilian gun production. The firm also manufactured breech loading guns, with a modification of the break open design later patented by Granville. Ultimately however the Henry operation could not compete with larger firms with mechanized assembly lines, and by 1895 no gun parts were made at the Boulton factory, although production of assembled guns was continued until 1907.

"In 1914," notes Robert P.L. Fricke, "five hundred acres of Henry land were sold to the South Easton Water Company. The purpose was to procure a water source from the Bushkill Creek. The company turned over the title to this tract to the City of Easton in 1936. By this time, all the remaining structures within the area had been demolished as potential hazards, except the Gun Factory itself... The Commonwealth of Pennsylvania in 1959 purchased the land from the city, to create Jacobsburg State Park. The holdings were eventually increased to some 1,100 acres."<sup>66</sup>

Sours Mill - Between Jacobsburg and Aluta, Bushkill Township

On an 1874 map of Northampton County there is a gristmill located on this site, given the

name Sours Mills. This area was later known as Bouers Mill.

#### Aluta Mill - South central Bushkill Township

Until about 1900 this small community in the northern part of the county was called Mill Grove because of the numerous mills located here. One P. Siegfried was running a clover mill in the area as early as 1800. By 1874 a tannery was also in operation. The name Aluta is Latin for "soft leather."

Martin Smith visited the remaining mill during his research and noted that "Edward Bowers now owns and operates this mill running a feed and custom grinding business. The mill is a frame structure built on the foundations of a previous stone mill which had burned. Bowers had been at the mill since about 1916. The frame mill was built by Frank Ianers, who came to Aluta from Friedensthal, where he was the tenant miller. He bought the property and spent about \$15,000 in restoring and equipping the mill." When Smith spoke with Bowers, the mill was not doing much business.<sup>67</sup>

By 1979, the structures were in ruins.

#### Lafona Mill - Plainfield Township

Unlike the Aluta Mill, there had been no grist mill on the site before 1900, but a saw mill had been built earlier on the property. This was the original Germanton mill. The water rights, not on the mill property, were purchased by Conrad Germanton from Henry Houser in 1790.

A post office was established here, about one mile south of Plainfield Church, in 1900 and a small settlement including a gristmill, store, creamery and blacksmith shop became established. The gristmill was a frame building, also built about 1900 and added to in subsequent years. The post office was closed in 1905.

J. C. Heaney was the owner and operator of the saw mill when interviewed by Martin Smith. Like Bowers at Aluta, Heaney ran a feed and custom grinding business. The year before Smith visited, the mill cut only about 1000 feet of lumber.<sup>68</sup>

#### Haynes or Heyer Mill - Bushkill Township

An 1874 map of the county shows a small community had grown up around a gristmill on this site. It last appears in maps of the 1940s. "Heyer's Mill Road" which runs past the mill, certainly suggests that a Heyers family once operated complex. The stone building containing a wooden wheel is still standing and well preserved. Remnants of the mill pond dam and retaining walls are evident.

#### **Other businesses and mills along the Bushkill**



## Rinek Rope

The Rinek Rope company was begun in 1840 by Jacob Rinek. At first, all the rope was produced by hand, but demand grew and his business flourished enabling him to expand. In 1863, three of his four sons joined the firm. A fourth joined shortly after Jacob's death in 1868. By 1877, the factory was relocated from Walnut Street to a site along the banks of Bushkill Creek, about one half mile above the city of Easton. Nearly 100 men were employed producing 1,000 tons of rope annually, with a retail value exceeding \$300,000. This business continued into the twentieth century, guided by successive generations of Rineks, until the family sold the concern in 1970.

## Simon Silk Mill

Probably the largest industrial concern in operation along the Bushkill Creek was the Simon Silk Mill. By the 1880s the Easton Board of Trade, like its counterpart in Allentown, was aggressively pursuing new businesses for the city. The Panic of 1873 had slowed the economy but the mills of Paterson and northern New Jersey were booming. Herman Simon, the owner of Union Silk Mill in Hoboken, New Jersey, came to Easton in early 1882 to discuss establishing a mill for throwing or spinning silk. It was hoped that such an enterprise would create two to three hundred new jobs.

As an incentive for Simon to locate in the area, Eastonians and other investors would provide this capital, through bonds paying 5% and secured by a mortgage on the building; Simon would provide the machinery. Simon estimated that a mill could be built for \$15,000. Several days later this figure was raised to \$18,000 and by the next week, \$20,000. The final amount - at \$35,000 almost double the original estimate - was raised.

Cash, however, was not the only means used by the local business community to lure Simon to Easton. A sizable tract of land located along the Creek near 13th Street was donated as the site. J. T. Williams offered to deliver stone for the foundation free of charge, and a plank walk from Wood Street to the mill's location was promised.

Perhaps the most compelling economic advantage for Simon to build a factory in Easton was cheap labor - prevailing wages of \$4.25 to \$4.75 per week were more attractive to management than the \$6.00 to \$6.50 being paid in Hoboken. The mill opened in 1883.

The mill complex grew rapidly. Uzal Condit paid a visit to the site in 1898 and recorded a description for several local newspapers. The first mill was 140 x 55 feet, and contained the boiler, engine house, and an office annex. (This was the building was paid through the financing of Easton citizens). Two stories had been added to the office annex. Two new buildings were proposed to add two additional operation areas to the six already in existence. Four engines with a total of 610 horses powered the machines for spinning, doubling, and twisting - all steps to prepare silk for the looms. In another section of the property some of the 800 employees wove silk good and ribbons.

Labor unrest reached the Simon enterprises in 1912. Rudolph Katz of the IWW organized a chapter in Easton, whose membership met in May of that year and requested a raise. Management negotiators were late in arriving for a scheduled meeting and the workers went out peacefully. There was some dispute as to the number of those who struck - the Easton Sentinel reported that 1,000 workers walked out, the Simon-owned Easton Daily Free Press reported 550 to 600, with the majority of the strikers "of the foreign element." There were three basic demands: reduction in the work week from 59 to 54 hours, a 15% pay increase and recognition of the new union. Management offered a 5-10% increase and agreed to the reduction in hours. Negotiations were conducted in English and German; however, at the worker's meeting later that evening, management's plan was translated into Italian, Lithuanian, Yiddish, Slavish, Russian and Polish. Following several hours of discussion, concluding with urgings from Katz to accept, union members agreed to accept management's position.<sup>69</sup>

Herman Simon died in 1913; the Simon milling company was acquired by a syndicate headed by local businessman William R. Haytock in 1922.

### Bushkill Park

Bushkill Park formally opened on July 3, 1902, on land formerly owned by the Bushkill Milling Company, immediately adjoining the stone bridge over the creek. It was part of the development of properties owned by the Northampton Transit Company or "Hay Line" trolley, which ran by the park on its route from Easton to Nazareth. Walter's Island, just upstream, was already a popular site for picnics and family outings.

The park was typical of many developed during the period by trolley companies to encourage weekend ridership. At the park there were amusements, a dance pavilion, benches, swings and tables as well as a baseball field. Original rides at the park included a roller coaster, which ran parallel to and over the Creek, a penny slide, a circular swing whip and the "Pretzel."

Electricity for the park was taken from the trolley line. Morgenstern remembered that the merry-go-round slowed and the lights dimmed when the trolley was climbing the grade from Wood Street.

Thomas V. Long leased the park in 1932 and bought it in 1939 from the liquidating trustees of the trolley line. The Long family had already been in the amusement part business for many generations, operating parks in New York state and building carousel.

Over the years the park added attractions, including in 1933 a Long Family Carousel with frames and decorative work by members of the Lang Family. Animals, including zebras, giraffes, and camels, on the three row menagerie were hand carved in Philadelphia by master carver Daniel Muller and his brother Alfred. The carousel had previously used at Burlington Island Park in New Jersey and Island Park along the Lehigh River west of Glendon and Lakewood and Oakwood Parks. This ride was sold in May, 1991 and removed from the site.

The Long family acquired additional acreage until, in 1979, the park covered 27 acres along the creek. Although the carousel is gone, the park, acquired by others, is still open for the summer season.

### Empire Agricultural Works

This business was founded by Samuel S. Messinger, a descendent of Michael Messinger, an immigrant who acquired a large tract of land near what is now Tatamy. By midcentury, Messinger had established a blacksmith shop on the western bank of Bushkill Creek. In 1857 he added the manufacture of plows and plowshares to his smithing and employed one moulder and one machinist. In 1861 the buildings were enlarged, increasing the facilities for manufacturing. Messinger began producing threshing, mowing and reaping machines. The business stayed in the family; in 1873, Frank G. Messinger joined his father.

In 1883 a large machine shop, measuring forty-eight by ninety-eight feet, four stories high, and a moulding factory forty by seventy feet were built. When Condit visited in the 1880s Messinger manufactured mowers, reapers, twine-binders, horse powers, threshers, cleaners and other farming equipment. Seventy five people, most from the village of Tatamy, which had grown up nearby, were employed there.

### Slaughterhouses

There were a number of slaughter houses located along the edges of the Creek between 3rd and 4th Streets, an area referred to in the late nineteenth century to as "Slaughter House Row." Some of the more ephemeral establishments were M. Moses Hide House, which appears on the 1892 Sanborn Map at North 4th Street and the Creek and McCoy's Tannery, which is shown on a map of 1850 along the creek between 4th 5th.

### Tanneries

Tanneries had existed in this area almost since the founding of Easton. Three of the more established businesses were:

#### Shnyder's Tannery

Herman Shnyder settled in Easton in the 1760s, and is listed in two subsequent tax rolls as a tanner, owning both a house and a lot on the northern boundaries of the city. This business continued for many years on the same site for in 1849, Peter Shnyder took the city to court for damages to the tannery from water collected in a rubbish filled alley. The Shnyders were a prominent family; Phillip Mixsell in the March 1869 Easton Argus remembered Peter Shnyder as the richest man in Easton.

By 1871 there was only one tannery in the city of Easton, owned by John S. Lehn, who had

been in business since 1863. He had acquired the Snyder tannery, which had been in decline, and manufactured oak, sole, belt and hose leather and shoe skirting. 800 cords of oak bark were used annually in the production of 8,000 sides of leather.

The operation took place in several different buildings: the first, a three story frame structure had a basement with cemented walls in which the hides were salted. Above this, on the first floor, were 52 tanning vats of various sizes which altogether held up to 1865 hides. Lehn ground and stored the bark for tanning on the premises, as well as in a facility in Uttsville, and maintained a show room for the finished products on site. Next to the store a second building held the drying hides. The floors of the two story building were merely slats, to facilitate air flow. The second floor was dedicated to drying hair, which would later be sold to plasterers.<sup>70</sup>

Lehn's operation was powered by a ten horse-power engine and heated by steam, rather than relying on the direct water power of the creek. The site was later occupied by H. A. Sage Company, furniture manufacturers.

#### Barnet's Tannery

Another early settler in Easton, Henry Barnet, was well established by 1776, when the tax assessment included among his holding a stone house on the southwest corner of Hamilton and Bushkill Streets, two horned cattle and two horses. At his death in 1801, his estate included two stone houses, six acres of land, two lots in the borough of Easton, and a tanyard.

His family continued the tanning business, opening a store to sell finished leather goods on Northern Street in 1820. A description of the tannery appeared in the Easton Democrat and Argus in 1831. At that time, there were "76 vats sunk, and in good order; a Beamhouse, currying-shop, Fulling-mill, Bark-mill, slaughter-house, a large Bark-house and a six-horse power low pressure Steam Engine for driving the works." As at Lehn's, Barnet's business did not depend on water for power, but required great quantities to rinse the hides.<sup>71</sup>

By 1835 the Ihrie family was offering a tannery on the corner of Bushkill and Hamilton for sale or rent.

#### Nennig's Tannery

This business appears at a site along the Bushkill on Sanborn Insurance maps from 1885 until 1912. Located at the rear of Mount Jefferson, just upstream from Groetzinger's mill, Nennig's was close to slaughterhouse row and a source of hides. Nennig manufactured calf kid and was a dealer in hides and skins. Morgenstern related that one summer morning when he was a child, Nennig's burned to the ground. He rebuilt a shop at the foot of Sullivan's Lane, but that too burned; he then moved to Odenweldertown

#### Schweyer Quarry

An outcropping of high grade serpentine marble occurs at the far end of Chestnut Ridge, near the intersection of Bushkill Drive, Lafayette and Thirteenth Streets, within 200 feet of the northeast bank of Bushkill Creek. Henry A. Schwyer of King of Prussia leased the property from the C. K. Williams company and opened a quarry on the site in 1905, mining rough cut slabs of serpentine. The high grade dark and light green serpentine was cut, polished and used for decorative purposes.

## **Bridges**

### Hamilton or 4th Street Bridge

Easton's first bridge across the Bushkill, in fact the first bridge in the city, was of wood and spanned the creek at Hamilton (now 4th) Street. Workmen supervised by Commissioners Peter Kichline and John Moore consumed a barrel of cider and fifteen gallons, three quarts of rum during its construction. The wooden structure was replaced in 1792 by a stone three arch bridge. When the Bushkill Street bridge was completed in 1873, the 4th Street crossing was demolished.

### 3rd Street Bridge

The 4th Street bridge remained the only passage across the Bushkill until 1833, when a second wooden bridge was built at Pomfret (3rd) Street. This bridge was replaced by a stone structure in 1836, when the Commissioners of Northampton County called for bids for a 30 foot two arched bridge; one 20 foot arch to span the natural bed of the creek and the head race for Mixsell's mill, and a 7 foot arch over the tail race of Snyder's tannery.<sup>72</sup> Jacob Mixsell had the contract to provide earth and stone and the winning bid of \$7,200 was made by J. M. Porter. The founding of Lafayette College the previous year no doubt provided incentive for this additional crossing.

In 1882 the bridge was widened, the process attracting both attention and controversy. One newspaper account referred to a graffiti-covered sign posted at the site and criticized the quality of the work being done: "There is scarcely a well made joint in the entire railing."<sup>73</sup>

Over the years the roads in Easton became wider to accommodate increased traffic and the introduction of trolley lines. By 1893, there was a general consensus that the 3rd Street bridge needed to be widened to match the approaching roads. The nearby business of Mann and Allshouse released the County for all damages from whatever land was necessary for the structure. Bids were taken and a contract awarded when a political furor erupted. The contract was rescinded, and a new set of County Commissioners informed the city of Easton that it was responsible for the bridge. The city sued successfully, the original contractor started work despite not having a contract with the county and the new Commissioner asked for new bids, Mann and Allshouse had bridge workers on their property arrested.

### Front Street Bridge

The third location in Easton where the Bushkill was spanned by a bridge was at Front Street. Built in the summer of 1850, it was a double arched stone structure.

### Bushkill Street Bridge

In 1873 an iron bridge across the Bushkill at Bushkill Street was completed. The old stone bridge crossing at Fourth Street had become dilapidated and a new location, just upstream, was selected to supplement the crossing at 3rd Street. The abutments and center pier were built by Jacob F. Rafferty; the iron superstructure constructed by William H. Law. The new bridge was 130 feet long and consisted of two spans, each with two arches connected on the center pier. These four wrought iron arches stood six feet seven inches high in the center. Each end of the bridge rested on expansion rollers upon the abutments.

Fourteen iron beams, nine inches deep and 28 feet long supported wooden stringer laid longitudinally on the bridge. These in turn provided a foundation for the final planking. The bridge could carry a load of one gross ton per linear foot. When it was finished, the old bridge at Fourth Street was demolished. Outside the arches on each side of the bridge were walkways for foot traffic, complete with wrought iron railing. 9/11/73

### Cemetery Bridge

In December 1837 an essay in the Democrat and Argus profiled the old bridge that crossed the Bushkill "a little ways below Wagener's old stone mill." The area was pictured as dark and gloomy. "It scarcely excites our surprise," wrote the unknown author,

it should have been regarded in the olden times as the favorite abode of specters and apparitions. Some thirteen years since, it was currently reported and universally believed that an apparition in the shape of a human being divested of a head made its appearance here at season when the moon was full, about the mid hour of the night, stalked slowly across the decayed sleepers of the bridge and vanished on the opposite bank of the creek.<sup>74</sup>

Ironically, within ten years, this was the bridge to the newly created "City of the Dead," or Easton Cemetery.

The cemetery company was responsible for completing a new bridge at this site in 1870, after the old one was swept away in a flood. It was longer, wider, and higher than the old bridge and constructed of iron resting on abutments of masonry. There was space enough for carriages as well as a pedestrian crossing four feet wide.

### 13th Street Bridge

Another bridge crossed the creek at 13th Street, and was known as the "Hogtown" bridge. A first span was built here in 1838, but a flood the following year did considerable damage and it was replaced in 1840. By 1885, there was general agreement that a new bridge was necessary. The old one was below street level and dirt and mud washed onto it each time it rained. Traffic had increased with the expansion of the Williams Company and opening of the Simon Silk Mills.

J. T. Williams was instrumental in having the wooden bridge removed before it was damaged by a flood, and a new stone three pier bridge was built in its place. The plaque from that bridge and perhaps some of the foundation still remains, the rest was replaced in 1927.

#### Bridge at Bushkill Park

This bridge, a hundred foot double span over the creek, existed until the mid 1980s. Highway studies early in the decade had cited the structure, for which no construction date was known, as obsolete. In 1985 the bridge was demolished, along with the old dam which served the Uh and later the Bushkill Milling Company's mills. The structure was not destroyed without protest; many decried the effect on the beauty of the area.

#### Bridge at Walter's Upper Mill

Further upstream, the Northampton County Commissioners had an iron bridge perhaps the second in the county constructed at Walter's Upper Mill in Palmer Township in 1861. It was apparently different than other bridges in the area, as local mechanics had not built one like it previously.

A bridge in the Penn Pump park area was replaced by new span as part of the Bushkill Drive reconstruction in 1969. The old narrow bridge entered the Drive at too sharp an angle for traffic to negotiate.

#### Bridge at Michael Stocker's

A bridge existed at this site since early in the nineteenth century. County records indicate that repairs to a bridge at Michael Stocker's were made in 1839. The stone bridge which stood near Stocker's Mill became the center of controversy in 198 and 8. School district officials, concerned with the sharp turn that buses were required to make to cross the Bushkill, proposed to build a new span. It was also believed that the old stone piers caught debris and contributed to flooding in the area by damming the creek.

Opposition to the new bridge organized in an unsuccessful attempt to convince the county to retain the old span. It was demolished in August 1969 and a new bridge was constructed several

hundred feet downstream. The following April debris backing up against the footings of the new bridge caused Bushkill Drive to flood.

### Bridge at Stockertown

The first iron bridge in the county was erected over the Bushkill at Stockertown near the home of Jacob Roth. Work started on the 53 foot span in November 1859 and was completed the following April.

### **Floods**

Water powered the mills; although races, dams and ponds helped control the flow, operators were dependent on water. In a flood they were at its mercy; flooding could prove disastrous. When in flood, the Delaware River backed up the creek and caused damage to property at the mouth of the Bushkill. Sometimes the creek itself would flood after a heavy rain. Flood damage to the uppermost mill in a series of mills along a creek could cause a chain reaction of damage all the way to the Delaware.

In Matthew Henry's History of the Lehigh Valley he states that some residents of Easton still remembered that during a flood on the Bushkill, water from the creek would fill a gully running north and south through the town, connecting the Bushkill with the Lehigh. The gully was supposed to have been located halfway between the Delaware Bridge and the old courthouse.<sup>75</sup>

Newspapers often carried the news about floods on the Bushkill, the Lehigh and the Delaware. A flood in June 1838 was the worst in years, one paper reported, and was worsened by dams breaking at Cope's, Henry's gun factory and Catherine Furnace. "The pens of some of the distilleries were emptied of their swinish multitudes without notice. In one instance a stable containing three cows, chained to the rack, was lifted up with its contents and floated about 400 yards to an island and there deposited itself and freight, none the worse for the ride"<sup>76</sup>

In January 1839 the Easton Democrat and Argus reported a particularly devastating flood which had suddenly swept down the Bushkill valley. Two days of rain falling on frozen ground led to flood levels three feet above those of the previous June. "Fences, hay-stacks, corn cribs, out-houses, and wood, were swept from valleys where heretofore they have never dreamed of suffering such losses! Great injury has also been done to grain, stored in buildings in low grounds."<sup>77</sup>

The Wageners, Herster, Barnet, Yohe and Heller, Michler Odenwelder and Kemmerer lost or suffered heavy damages to their dams. Bridges at the Wagoner's, at Thompson's distillery and a new stone bridge at Herster's and Barnet's were also destroyed. Herster and Barnet also lost their brand new pigpens, although they managed to save the hogs.

Another damaging flood occurred in August of 1859. This flood washed out two mill dams at Michael Butz's property and a portion of a Major Cope's dam in Bushkill Township was also



damaged. The Easton Argus reported that the flooding was the worst in many years, excluding those times when the Bushkill was backed up by the Delaware.

The creek flooded in the last year of the following decade, when on December 2, 1869 the bridge at Easton Cemetery was washed out and the arch bridge near Butz's mill was in danger.<sup>78</sup>

The Delaware flood of 1903, when the river reached a peak never before recorded, a full six feet higher than in 1842 or 1862, caused damage along the lower Bushkill. Travel on the Hay trolley line was suspended when the Third Street bridge was entirely covered with the rising water. As usual with a Delaware River flood, Mann and Allshouse mill was severely damaged. Water reached the roof.<sup>79</sup> In the offices of Groetzinger's mill, the water reached a height of 8 feet, several hundred bags of flour and oats were damaged. The flood waters reached upstream to the Stair Planing Mill and the Williams Chemical Works also lost product to water damage. A positive, unexpected side effect of the flood:

Along the south side of the Bushkill above Third Street a number of barns, stables and other light buildings and the old slaughter house, too, were swept from their foundations and most of them are wrecks. The removal of the slaughterhouse is not causing any very serious regret among residents of that locality<sup>80</sup>

Rain from an Atlantic hurricane in 1933 also damaged the Mann and Allshouse mill, where water came within three inches of the manufacturing floor.<sup>81</sup> Equipment and supplies were moved out of the way of the water, which was the highest since the floods of 1903.

The great flood of 1955 affected the entire northeast. The Bushkill rose rapidly during the early evening of August 18th, then began to recede after midnight. Two bridges in Bushkill Township were washed out, and a man had to be rescued from the roof of his car when he became trapped in the rising waters between Bushkill Center and Jacobsburg. Later, waters from the Delaware backed up into the creek and flooded Pearl and Bushkill Streets area. Bushkill Drive was underwater as far upstream as Dietrich Road.

As noted above, July 1969 saw heavy rainfall; the waters of the creek covered the piers of the new Stocker Mill bridge, and all four bridges across the creek in Palmer were closed.

The Bushkill still floods after heavy rains. One of most recent noteworthy floods occurred in January 1979, the wettest January on record. The creek overflowed in Stocker Mill Road area, cutting off the old mill buildings. Tatamy Road, Walters Avenue, Newlins Mill and Seipsville Roads were all closed after 8.37 inches of rain pelted the area over the course of the first 31 days of the year.

## NOTES

1. James A. and Linda P. Wright Place Names of Northampton County, PA (1988), pp. 29-30.
2. W. Ross Yates, History of the Lehigh Valley Region (Joint Planning Commission Lehigh-Northampton Counties, November 1963) frontispiece.
3. Ellis, Franklin History of Northampton County, PA 1752-1877 (Philadelphia, PA: 1877), p. 246.
4. Yates, p. 35.
5. Theophile Cazenove Cazenove Journal, 1794; a Record of the Journey of Theophile Cazenove through New Jersey and Pennsylvania ed. Rayner Wichersham Kelsey (Haverford, PA: The Pennsylvania History Press, 1922), pp. 18-19.
6. Hopkinson, Joseph "Easton," Philadelphia Monthly Magazine September 1798; reprinted as "Easton 71 Years Ago" in Easton Argus, March 11, 1869.
7. Easton Argus, March 3, 1827. In the next week's edition, the editor corrected the figure of 250,000 barrels (a typographical error) to 90,000.
8. Thomas Edward Jones, ed. Forks Township (Easton, PA: Northampton County Historic Resource Survey, n. d.), pp. 13-36.
9. Easton Argus September 1, 1859.
10. Easton Centinel, November 7, 1817. Less conventional uses were also found for millstones; they were sometimes carried in 4th of July parades or used as stepping stones. In 1839 a millstonemaker brought a flint buhr block into the office of the Easton Democrat and Argus to point out to the editor several sea shells embedded in the stone. In the February 12 issue, the editor related the story remarking that the solution "will take a wiser head than ours."
11. Northampton Whig, June 5, 1832.
12. Easton Centinal, March 29, 1833.
13. Easton Argus, February 27, 1868.
14. Uzal W. Condit, History of Easton, Pennsylvania 1739-1884, (Easton, PA: G. W. West, 1889) p. 84.
15. Easton Sentinel July 11, 1850.
16. John Stork and Walter Dorwin Teague Flour for Man's Bread: A History of Milling (Minneapolis, MN: University of Minneapolis Press, 1952) p. 151.

17. Easton Semi Weekly Free Press, September 5, 1890.
18. Census of the United States, 1880 Reports on the Water-Power of the United States pt. 1 W. P. Trowbridge, "Statistics for Power and Machinery Employed in Manufacturers." (Washington, D.C.:Government Printing Office, 1885), p. 109.
19. B. F. Frackenthal, Improving Navigation on the Delaware River with Some Accounts of its Ferries, Bridges, Canals and Floods." (Bucks County Historical Society Proceedings, 1909), p. 110. Weaver, p.47.
20. Harvey C. Morgenstern This I Remember (Easton, PA: The Easton Express, n.d.)
21. Easton Centinal February 27, 1851.
22. Condit, p. 84.
23. Easton Argus, September 28, 1865.
24. Engineer's Report of the Easton to Nazareth Railroad (Easton, PA: J. P. Hetrick, 1860), p. 6.
25. Condit, p. 469.
26. Easton Express, September 3, 1891.
27. Morgenstern.
28. Morgernstern.
29. Condit, p. 80.
30. Easton Semi Weekly Free Press, August 25, 1908, p. 5.
31. Interview with Helen Mann Hallman, April 4/21/93.
32. Georgie Lake Chidsey, And This I Remember (Easton, PA: Fortnightly Club, 1951) p. 6.
33. Condit, p. 80.
34. Easton Democrat and Argus, March 22, 1838.
35. Easton Argus, January 24, March 14, 1861.
36. Easton Argus, January 26, 1865.
37. Condit, p. 80.

38. Easton Argus, August 23, 1871.
39. Easton Argus, May 18, 1854.
40. Easton Democrat and Argus, March 6, 1841.
41. Easton Argus, March 26, 1868.
42. Easton Express, April 9, 1925, p. 1.
43. Albert W. Gendebien, The Bushkill Tract, paper presented at meeting of the Northampton County Historical and Genealogical Society, March, 1994.
44. Easton Express, November 23, 1868.
45. Ellis, illustration between pp. 156-7.
46. Condit, p. 82.
47. Easton Daily Free Press, May 26, 1892.
48. Morgenstern.
49. Easton Democrat and Argus, October 7, 1841.
50. Easton Democrat and Argus, June 17, 1830.
51. Easton Free Press, July 126, 1880, p. 3.
52. Henry, History of Lehigh Valley, p. 103.
53. Weaver, p. 123.
54. Easton Centinel, January 3, 1823.
55. Easton Argus, August 29, 1867.
56. Easton Espress, January 10, 1868.
57. Martin Smith, Interview with Jacob B. Overholt, about 1940.
58. Easton Express, January 24, 1941.
59. Easton Democrat and Argus, May 28, 1846.
60. Easton Argus, February 20, 1862.

61. Easton Democrat and Argus, November 4, 1847.
62. Easton Express, January 7, 1930, p. 5.
63. Easton Argus, September 27, 1866.
64. Henry, p. 150.
65. Spirit of Pennsylvania, December 15, 1815.
66. Robert P. L. The Henry Heritage From Nazareth to Boulton (Nazareth, PA: Moravian Hall Square Museum Craft Shop, 1994), pp. 35-36. A brief and clear account of the Henry family and its enterprises in Northampton County.
67. Smith, interview with Edward Bowers, n. d.
68. Smith, interview with J. C. Heaney, n.d.
69. Easton Sentinel May 7, 1912 and Easton Daily Free Press May 3 & 4, 1912.
70. Easton Express, March 8, 1871.
71. Easton Democrat and Argus, September 1, 1831.
72. Easton Democrat and Argus, March 24, 1836.
73. Easton Daily Free Press, April 4-5, 1882, p. 3.
74. Easton Democrat and Argus, December 21, 1837.
75. Henry, p. 51.
76. Weaver, p. 76.
77. Easton Democrat and Argus, January 31, 1839.
78. Easton Argus, December 2, 1869.
79. Easton Express, October 10, 1903, p. 1.
80. Easton Express, October 12, 1903.
81. Easton Express, August 25, 1933, p 1.

## Bibliography

### Newspapers

Newspapers changed names frequently in the nineteenth century, notes may reflect a variant name of the papers listed below.

Easton Daily Argus

Easton Centinal

Easton Daily Free Press

Easton Express

Easton Free Press

Easton Whig and Journal

Northampton Whig

Spirit of Pennsylvania

### Interviews

Joseph W. Ayers January 13, 1993

Helen Mann Hallman April 21, 1993

### Books and Articles

Arndt, John Stover The Story of the Arndts Philadelphia, PA: Christopher Sower Co., 1922.

Anonymous A Brief History of C. K. Williams & Co. May, 1947.

Anonymous "History of the Easton Plant" Annual Board of Directors Visitation C. K. Williams Division, Chas. Pfizer & Co., Easton, PA: May, 1964.

Anonymous, The Story of a Rainbow Easton, PA: Binney and Smith, 1961.

Boericker, Gideon and Robert S. Strader Test for Efficiency of a 48 Inch Turbine in Mill of Mann and Allshouse Easton, PA. unpublished thesis Easton, PA: Lafayette College, 1896.

Carr, Jess The Second Oldest Profession: An Informal History of Moonshining in America Englewood Cliffs, NJ: Prentice Hall, Inc., 1972.

Carson, Gerald The Social History of Bourbon New York: Dodd, Mead & Co., 1963.

Cazenove, Theophile Cazenove Journal, 1974; a Record of the Journey of Theophile Cazenove through New Jersey and Pennsylvania ed., Rayner Wickersham Kelsey Haverford, PA: The Pennsylvania History Press, 1922.

Census of the United States, 1880 Reports on the Water-Power of the United States pt. 1 W. P. Trowbridge, "Statistics for Power and Machinery Employed in Manufactures," Washington, D.C.: Government Printing Office, 1885.

Chidsey, A. D. Jr. A Frontier Village Pre-Revolutionary Easton Easton, PA: Northampton County Historical and Genealogical Society, 1940.

Chidsey, Georgie Lake And This I Remember Easton, PA: Fortnightly Club, March, 1951.

Condit, Uzal W. Historical Easton in the Last Decade Supplemental Sketch of Recent Events Easton, PA: West-Johnson Printing and Publishing Co., 1895.

Condit, Uzal W. History of Easton, Pennsylvania 1739-1885 Easton, PA: G. W. West, 1889(?)

Edwards, Joseph H. Environmental Assessment for Bushkill-Lower Lehigh Joint Sewer Authority and City of Easton, Northampton County, Pennsylvania Reading, PA: Gilbert Associates, Inc., July, 1976.

Ellis, Franklin History of Northampton County, PA 1752-1877 Philadelphia, PA: 1877.

Engineer's Report of the Easton to Nazareth Railroad Easton, PA: J. P. Hetrick, 1860.

Eschenbach, G. W. The Forks of the Delaware 1752-1900 Easton, PA: 1900.

Evans, Jamie H. "Shrunk to a Comparative Rivulet: Deforestation, Stream Flow, and Milling in 19th Century Maine" Technology and Culture vol. 33, #1 January, 1992.

Findlay, C. O. Review of the Wrought Iron Railroad Bridge Across the Bushkill at Walter's Mill unpublished thesis Easton, PA: Lafayette College, 1891.

Fackenthal, B. F. Jr. "Improving Navigation of the Delaware River with Some Account of its Ferries, Bridges, Canals and Floods" A Collection of Papers Read Before The Bucks County Historical

Society vol. VI, 1932.

Fortney, Kim, et. al. The Silk Industry in the Lehigh Valley Allentown, PA: Lehigh County Historical Society, 1993.

French, Stanley "The Cemetary as Cultural Institution: The Establishment of Mount Auburn and the 'Rural Cemetery' Movement Death in America Philadelphia, PA: University of Pennsylvania Press, 1975.

Frick, Robert P. L. The Henry Heritage From Nazareth to Boulton Nazareth, PA: Moravian Hall Square Museum Craft Shop, 1994.

Gendebien, Albert W. The Bushkill Tract paper, presented at meeting of Northampton County Historical and Genealogical Society March, 1994.

Hall, Karly Lee Kibler and Peter Dworkin The Lehigh Valley An Illustrated History Woodland Hills, CA: Windsor Publications, 1982

Hamilton, Edward P. The Village Mill in Early New England Sturbridge, MA: Old Sturbridge Village Booklet Series, 1964.

Heller, William Jacob Historic Easton from the Window of a Trolley Car Easton, PA: Easton Printing Company, 1912.

Heller, William Jacob History of Northampton County and the Grand Valley of the Lehigh New York, NY: The American Historical Society, 1920.

Henry, Matthew S. History of the Lehigh Valley Easton, PA: Bixler and Corwin, 1860.

Hunter, Louis C. A History of Industrial Power in the United States, 1780-1930 vol. 2, Waterpower in the Century of the Steam Engine Charlottesville, VA: Published for the Eleutherian Mills-Hagley Foundation by the University Press of Virginia, 1979.

Jones, Thomas Edward, ed. Forks Township Easton, PA: Northampton County Historic Resource Survey, n. d.

Jordan, John W. Historic Homes and Institutions and Genealogical and Personal Memoirs of the Lehigh Valley New York and Chicago: The Lewis Publishing Company, 1905.

Kelsey, Ray Wickersham At the Forks of the Delaware, 1794-1811; Chronicles of early travel to Easton and neighboring parts of Pennsylvania and New Jersey Haverford, PA: Pennsylvania History Press, 1920.

Kuhlmann, Charles Byron The Development of the Flour-Milling Industry in the United States



Boston, MA and New York, NY: Houghton Mifflin Company, 1929.

Kulp, Randolph L., ed. History of the Lehigh Valley Transit Company Allentown, PA: Lehigh Valley Chapter, National Railroad Historical Society, 1966.

Litchfield, Carter, et. al. The Bethlehem Oil Mill 1745-1843 Kemblesville, PA: Olearius Edition, 1984.

Lopresti, Virginia History of the Borough of Stockertown 1976.

Macauley, David Mill Boston, MA: Houghton Mifflin Company, 1983.

Means, Mary & Associates, Inc. Delaware and Lehigh Canal National Heritage Corridor State Heritage Park: Management Action Plan Bethlehem, PA: Delaware and Lehigh Canal National Heritage Corridor Commission, May, 1993.

Metz, Lance E. Sherman Guide to Hugh Moore Park Easton, PA: Center for Canal History and Technology, 1983.

Miller, William G. A Design for a Five Panel Pratt Bridge across the Bushkill River Easton, Pa. unpublished thesis Easton, PA: Lafayette College, 1891.

Morgenstern, Harvey C. This I Remember Easton, PA: The Easton Express, n.d.

Patterson, James F. Report for Mining 451 State College, PA: unpublished manuscript, 1983.

Reichel, Rev. William C. "Friedensthal and its Stockaded Mill A Moravian Chronicle 1749-1767" Transactions of the Moravian Historical Society Vol. II Nazareth, PA: Whiteman House, 1877.

Rinek Reliable Rope Easton, PA: Hobson Printing, 1945.

Rohabaugh, W. J. The Alcoholic Republic: An American Tradition New York, NY: Oxford University Press, 1979.

Royall, Anne Newport Mrs. Royall's Pennsylvania or Travels continued in the United States Washington, D.C.: printed for the author, 1829.

Semple, J. G. Review of the Wrought Iron Parabolic Truss over the Bushkill Creek Easton Pa unpublished thesis Easton, PA: Lafayette College, 1884.

Shaffer, Larry L. The Limestone Streams of Pennsylvania Pennsylvania Fish Commission, n.d.

Skillman, David B. Whence Came our Early Placenames? Easton, PA: Northampton County

Historical and Genealogical Society, 1960.

Smith, Martin A. The Historical Value of the Henry Properties unpublished real estate appraisal Easton, PA September, 1971.

Smith, Martin A. Collection of Notes on the Bushkill unpublished manuscript n.d.

Stevens, Stephanie Forgotten Mills of Readington Scotch Plains, NJ: Supreme Lithographers, Inc., 1987.

Stewart, R. T. Design for a Wrought Iron Highway Bridge Across the Bushkill Creek Easton, Pa. unpublished thesis Easton, PA: Lafayette College, 1890.

Storck, John and Walter Dorwin Teague Flour for Man's Bread: A History of Milling Minneapolis, MN: University of Minneapolis Press, 1952.

Tyler, William Dowlin Review of the Highway Bridge over the Bushkill at the Entrance to the Easton Cemetery unpublished thesis Easton, PA: Lafayette College, 1888.

Volin, Rochelle B. Project Manager EPA Draft Environmental Impact Statement on Wastewater Collection and Treatment Facilities Bushkill-Lower Lehigh Joint Sewer Authority and Borough of Nazareth Northampton County, Pennsylvania December, 1979.

Wallace, Paul A. W. Indian Paths of Pennsylvania Harrisburg, PA: The Pennsylvania Historical and Museum Commission, 1965.

Weaver, Ethan Allen Local Historical and Biographical Notes collected by Ethan Allen Weaver, from the files of newspapers published in Easton, Pennsylvania Germantown, PA: 1906.

Weston, Roy F. Comprehensive Water Quality Management Plan: Upper Delaware River Basin: Study Area 2 Pennsylvania Department of Environmental Resources, 1972.

Wright, James A. History of Forks Township 1991.

Wright, James A. History of Palmer Township Palmer, PA: Palmer Township Historical Society, 1984.

Wright, James A. and Linda P. Place Names of Northampton County, PA 1988.

Yates, W. Ross History of the Lehigh Valley Region Joint Planning Commission Lehigh-Northampton Counties November, 1963.

Zimiles, Martha Early American Mills New York, NY: C. N. Potter, 1972.

**Maps**

Sanborn-Perris Map Company, New York. Maps of Easton, PA.