G10

SHORT PRELIMINARY BIBLIOGRAPHY PRIMARILY CONCERNED WITH NINETEENTH CENTURY GLASS BOTTLES

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Collectors book. Mainly photographs and lists of bottles by embossing, height, type, color, how made and price. Large number of medicine bottles photographed.

Baker Brothers and Company

1880 Baker Brothers and Company; Window Glass Catalog. Factories, Federal Hill, Glassware Factories: Spring Gardens, Baltimore.

Catalog illustrating bottles available to drug trade.

Baldwin, Joseph K.

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Excludes bitters and sarsaparillas, but good source for other products names, uses, proprietor's name and address, name of publication in which advertisement for product appeared and the date of the particular issue in which it appeared.

Blumenstein, Lynn

1965a Old Time Bottles Found in the Ghost Towns. Salem, Oregon: Old Time Bottle Publishing Company.

Collectors book. Photographs of some bottles with color and price.

1965b Redigging the West. Salem, Oregon: Old Time Bottle Publishing Company.

Collector oriented. Photographs of bottles, colors and prices. Several pages of medicine bottles.

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The New England Glassworks:

New Hampshire's Boldest Experiment in Early Glassmaking

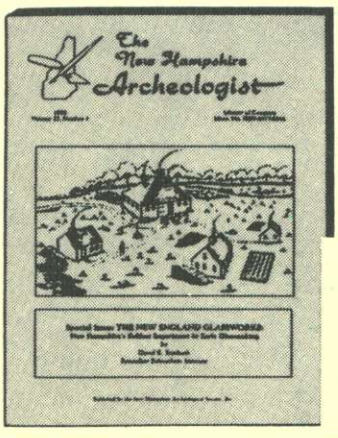
by David R. Starbuck, Rensselaer Polytechnic Institute

a special issue of
The New Hampshire Archeologist, Vol. 27, No. 1
published by the New Hampshire Archeological Society

Glassmaking was one of the earliest industries in the American colonies but also was one of the least successful and most capital-intensive. The brevity of most early glassmaking ventures in America has meant that few historical records have been left behind to document the technological processes or their social context.

One such glassmaking venture, the first in northern New England, was the New England Glassworks, located in Temple, New Hampshire (1780-1782), and is the subject of this new publication which describes the results of four years of archeological on-site investigation and eight years of intensive laboratory analysis and historical research.

Dr. Starbuck has made an important advance in the field of American industrial archeology and, with this publication, has contributed significantly to the understanding of the techniques, technology and socio-economic organization of early American glassmaking.



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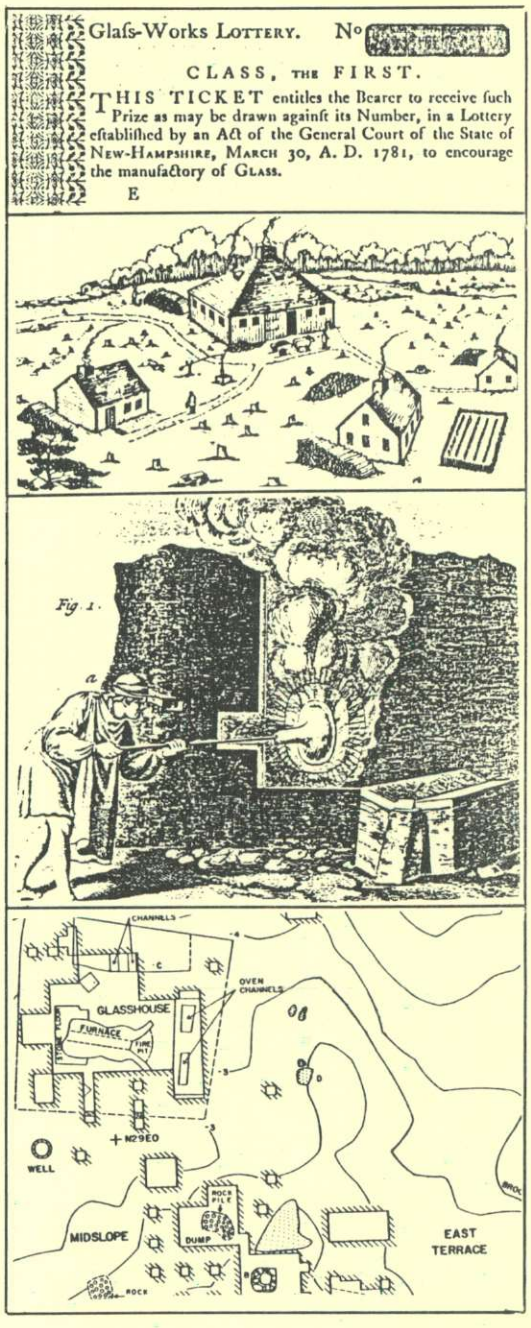

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Illustrations, from top to bottom: Lottery ticket intended to raise money for New Hampshire's first glassmaking venture; artist's conception of the New England Glass Works; spinning a globe of crown glass (from *A Diderot Pictorial Encyclopedia of Trades and Industry*, Dover Publications); a portion of the archeological site map.

The New England Glassworks in Temple, New Hampshire

David R. Starbuck

e New England Glassworks was New Hampshire's first ss factory, but, like many other American factories of e 18th century, it failed to achieve prominence before a ies of logistical and financial setbacks led to its abandon- nt. However, during its short history (1780-1782) this s the only factory manufacturing glass in New England, d it appears to have produced the first crown window ss made in America. Because historical records for this tory were extremely incomplete, a lengthy excavation s conducted at the site that exposed the remains of the sshouse, three workers' cabins, and a variety of special- rpose features and structures.

assmaking figured prominently among early American dustries, even though it was extremely capital-intensive d involved considerable risk. Most early glassblowers in e colonies had been trained in Western Europe, chiefly in ermany, and in most European countries glassworkers joyed high status and considerable financial success. But the colonies glass factories seldom lasted more than a few ars and rarely turned a profit. There were considerable zards from fire; fuel, usually wood, was consumed at an rming rate; and there were difficulties in competing with tter-made English and Irish glass. Moreover, a few ominent exceptions aside, scant encouragement was given colonial industries that would compete directly with the oducts of factories in the mother country.

ven the desirability of glass to the early settlers, it seems propriate that the first permanent English settlement in nerica—Jamestown, Virginia—had a glasshouse in opera- n by 1608 or 1609.[1] After a second abortive attempt at mestown, beginning c1621, the next effort was made in lem, Massachusetts, between 1639 and 1643. The Salem deavor probably succeeded in making crude window glass d bottles, but little documentation remains. There were ner 17th-century attempts, in New Amsterdam (New rk) in c1645 and 1654, and in Philadelphia, c1683, but it was not until the mid-18th century that there were sustained efforts, some of which were relatively successful.

First among these was the factory of Gaspar (and then Richard) Wistar, known as the Wistarburgh Glassworks.[2] Opened in 1739 in Salem County, New Jersey, this factory continued in operation until the American Revolution, producing window glass, bottles, and other hollowware. No other glasshouse of the period was as productive or operated as long, and this became the first of many successful New Jersey glass factories which thrived there because of fine sand deposits.

Other, lesser competitors of this period included: Samuel Bayard & Company of New York (c1752-c1785) which probably produced bottles and window glass; the Glass House Company of New York (1752-c1767) which produced bottles, flasks, and other glassware; the factories of Henry Stiegel in Lancaster County, Pennsylvania (at Elizabeth Furnace, 1763-1765, and at Manheim, 1765-1774), which produced window glass (Elizabeth Furnace), tablewares (Manheim), bottles, and other hollowware; and the Germantown Glassworks in Quincy, Massachusetts, which operated between 1752 and c1768 or 1769, producing bottles and perhaps cylinder window glass.[3] These were the best-known of the American glass factories prior to 1780, but none seriously challenged the cheaper, better-made glasswares imported from Europe. The lack of skilled labor in the colonies and English policies that throttled competition ensured that few industrial enterprises would be successful in the colonies until after the American Revolution.

The decade of the 1780s marks a turning point in American glassmaking because a veritable host of glass factories were started, and, once English domination was over, many of these became successful and long-lived, producing glass fully as good as that in Europe. Especially prominent among these was the New Bremen (Maryland) Glass Manufactory of John Frederick Amelung, c1785-1795,

VERMONT HISTORY

In This Issue

About The Contributors

L. Diana Carlisle was brought up in Burlington, graduated from Middlebury College with a BA degree in American history, and earned an MA degree in education from Fairfield (Connecticut) University. She was editor of *Newtown Past and Present,* about Newtown, Connecticut. A retired personnel consultant, Ms. Carlisle lives in Ridgefield, Connecticut, visits Vermont frequently, and has never lost her love for her home state.

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Lynn A. Bonfield, an archivist, has worked since 1985 at the Labor Archives and Research Center, San Francisco State University. **Mary C. Morrison**, the great granddaughter of Roxana, is a teacher and author of *Let Evening Come: Reflections on Aging* (New York: Doubleday, 1998). They are the co-authors of *Roxana's Children: The Biography of a Nineteenth-Century Vermont Family* (Amherst: University of Massachusetts Press, 1995). Lynn divides her year between Peacham and San Francisco; Mary, between Cabot and Kennett Square, Pennsylvania.

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Stephen K. Astmann is a writer, instructor at Schenectady County Community College, and worked with the National Park Service. **Ronald F. Kingsley** is emeritus professor at Kent State University and a research associate with the Vermont Division for Historic Preservation. **Virginia Burleigh LaPointe** is a library science media specialist with the Ticonderoga Central School and a trustee of the Ticonderoga Historical Society.

Champlain Glass Company: Burlington's First Manufacturing Enterprise

"Enterprising, diligent, temperate, hopeful"[1]—this is one historian's description of the leadership needed for establishment and continued survival in the fascinating but risky business of glass-making in nineteenth-century Vermont. A story about the Champlain Glass Company is a story about such leadership.

By L. Diana Carlisle

The Champlain Glass Company was incorporated in Burlington, Vermont, on October 27, 1827 by an act of the General Assembly and hailed as the first extensive manufacturing operation in the area. Petitioners and incorporators were Joseph T. Barrett, John Peck, Lewis Allen, John S. Foster, and James Dean. Three of the incorporators took major roles in the new venture: Peck was elected president, Dean, treasurer and John S. Foster, superintendent. Another person who was to play an important part in the development of the firm joined the company at its beginning as an apprentice—fifteen-year-old Frederick Smith. "Enterprising, diligent, temperate, hopeful"—this is one historian's description of the leadership needed for establishment and continued survival in the fascinating but risky business of glass-making in nineteenth-century Vermont. A story about the Champlain Glass Company is a story about such leadership.[2]

The company was authorized to build a wharf, a storehouse, and other necessary buildings at the foot of Pearl Street or elsewhere on the shore of Burlington Bay near the site of the works and to construct a carriage road and railway from the wharf, including "proper cars and wagons

and machines, and engines."[3] The act provided for the governance of the corporation and specifically denied banking privileges, a reaction, perhaps, to the fact that the bank bills issued by the then defunct Vermont Glass Factory of Lake Dunmore had become worthless.[4]

Dr. John Peck, born in 1786, was 41 years old. A successful purveyor of wholesale goods, druggist and chemist, he was one of the most prominent men of that period. His firm, J. & J. H. Peck and Co., located at 320 College Street on the north side of the square in Burlington, had become the most extensive wholesale house in Vermont. Six- and eight-horse "land-ships" took on goods there for resale in interior towns of the state. Peck was the ideal man to distribute and market the window glass and other products of the new glass works. He held extensive real estate, helped found the Champlain Ferry Company in 1824, and was also an original stockholder of the Champlain Transportation Company incorporated in 1828.[5]

James Dean, LL.D., was a highly respected former professor of mathematics and natural philosophy at Dartmouth College and the University of Vermont.[6] He was one of the "enterprising citizens of Burlington"[7] who, along with Peck, chartered the Champlain Ferry Company and he also served as a director of the Champlain Transportation Company.


Champlain Glass Company.
Incorporated 28th October, 1825.
BURLINGTON, Vt. 5 Dec 1827
This Certificate entitles John Peck Esq to share
number One in the stock of the CHAMPLAIN GLASS
COMPANY, being one thirtieth part of its property, profits
and privileges; subject to its rules, and to a proportional part of its los-
es, liabilities and assessments. Reserving to the Corporation a first
right of purchase at the fair value, when sold.
James Dean Treasurer.
John Peck President.

Stock certificate number one, issued to President John Peck and signed by him as president and by James Dean, Treasurer. Special Collections, Bailey-Howe Library, University of Vermont.

Superintendent of the new works, John S. Foster, came from Boston, where he had been manager of Chelmsford Glassworks, a failed subsidiary of the Boston Glass Manufactory, the first successful producer in America of the prized crown window glass.[8] He remained in Burlington only a short time, moving across the lake in 1831 to become the first superintendent of the Redford Crown Glass Company. Apparently he was discharged from the Redford Company, unjustly, so he claimed. He then selected a site in Jefferson County, New York, where he founded a new glass factory, naming it Redwood so he could more easily compete with his former employer. He died of an apparent heart attack, on June 2, 1834 while on business in Watertown, New York. Foster was credited at his death with the high quality of glass products manufactured by all the companies with which he had been affiliated.[9]

Young Smith was the son of Caleb B. Smith, a prominent early settler in Shelburne and Williston. His father, a ship builder and captain, died when Smith was only four years old, leaving his mother to support him and his two-year-old sister.[10] After a common school education, Smith was "bonded out" at age twelve to a deacon. According to stories Smith later told his family, the deacon had agreed to feed and clothe him and pay his mother a small sum in exchange for his work on a farm, but, in fact "worked him so hard and fed him so poorly that it stunted his growth and forced him to run away."[11] He went to Burlington, worked for a year for a merchant and then, in 1827, was "bound out for the remainder of his minority (to age twenty-one)"[12] to the Champlain Glass Company. Smith was to remain with the company throughout all but two years of its more than twenty-year history, rising to management and eventually becoming an owner.

The Setting

For a number of years, Burlington's lakeside location had proved ideal for trade. Following the War of 1812, when commerce shifted away from Quebec City and Montreal and the European import and export trade these cities provided, Burlington remained a central point for the distribution of goods. To the south the Champlain Canal opened in 1823, providing passage from Whitehall, New York at the southern end of the lake all the way to Troy, and, via the Hudson River, to the New York City market. October 1825 marked the completion of the Erie Canal, an inland water route connecting the Hudson River with the Great Lakes. Development of cities along the route (Rochester and Buffalo) and in the Midwest opened up new markets for products, including

building-related materials such as window glass. It was now much cheaper to ship by canal than by road. Whereas wagon portage had cost $100 a ton, the canal boats cost the shippers only $12 a ton.[13] Reduced breakage of fragile cargo was a significant, added benefit.

Burlington, as the largest lake port, was a center of activity. Sailing ships filled the harbor. The Lake Champlain Transportation Company had been chartered and was building steamboats that traveled from Whitehall to St. Johns (present day St. Jean) in Lower Canada several times a week. Burlington was also the regional warehouse center to receive goods and produce and to send them on to the interior northern half of Vermont or down the Connecticut River to New Hampshire and on to Boston. It was natural that Burlington entrepreneurs would look for products to manufacture in the city. In glass, a product "highly prized"[14] at that time for both its practical and ornamental uses, they saw an opportunity.

Glassmaking

Prior to this period, glass companies in the United States had experienced difficult times, an example being the Vermont Glass Company at Lake Dunmore, founded during the War of 1812 but forced out of business in 1817 when foreign manufactured goods again entered the country. In the 1820s, in an atmosphere of growing pride in America and desire to support the development of home industries, protectionists succeeded in passing the Tariff Act of 1824. Glass was included as an import to be taxed. This protective tariff encouraged the Burlington glass company founders and, when they had secured the necessary materials and skilled craftsmen, they embarked on their new enterprise.

Raw materials for making glass are silica in the form of sand, flints or quartz and, to help fuse the materials, alkalis such as potash, mostly in the form of wood ashes or soda. Lime and salts are used as stabilizers, and in some recipes, small measures of arsenic and/or magnesia for additional transparency.[15]

Silica was readily obtainable in the "sandy and light"[16] soil of northeastern Vermont. In nearby South Burlington and Colchester, much of this abundant sand lay in deltas near the surface, making it economical to obtain. Two good bridges led to Colchester, enabling local landowners to bring materials to Burlington. A ledge of nearly white quartz rose east of Winooski Falls. Potash could be had from area farmers and suppliers[17] and limestone was plentiful in the eastern part of the area.

Because great quantities of wood were needed to fuel the furnace and stoke the fire for the high temperatures required to fuse the glass, it was crucial that a vast source of wood be nearby. Pine and hemlock grew in

the Burlington area in abundance, a heavy growth of the former covering present day Winooski Avenue. There were also vast tracts of hardwoods to the south.

Clay was also a critical item. It was used in building the pots, a careful and lengthy process which included an aging period, testing in a special pot furnace or oven and final placement in the main furnace. Charles Young, who visited the works in the 1830s, noted, however, that the clay used at the Glass Works had to be imported from Hamburg, Germany, "none having yet been found in America capable of resisting for any length of time the extreme heat of the furnaces."[18] Because of the intense heat even the average German clay pot lasted no longer than about six weeks before needing replacing.[19]

The Burlington works manufactured the window glass by the cylinder method. The process was as follows: upon arrival at the glass works the sand was washed and sifted and the quartz broken into small pieces and ground in a mill.[20] The silica and other materials were then measured by weight and shoveled together in the mixing room to make what was called the "batch." This was taken to the furnace room where it was put into the clay pots in the furnace and gradually melted at high heat. The resulting molten substance was called the "metal." When it cooled enough to be worked, the glass blowers were called. Using an iron blowpipe, they gathered the necessary amount of metal and blew it into a long cylinder. The cylinder was immediately cut down one side, usually with shears, and then taken to the flattening (or flatting) room where it was reheated in special annealing ovens and gradually opened out into flat sheets of glass before being cut to size.[21] This simple description belies the time-consuming and exacting procedures that went into the various stages such as making the pots, setting the pots, preparing the mix and stoking the fires so they would be just right for the melts or the cool-down stage.

Experienced manpower was crucial to this process. Inasmuch as many of the glassblowers came from abroad, mainly England and Germany, they were normally in short supply. After the Chelmsford Glassworks went out of business, however, John Foster may have recruited some former employees from the Boston area to the new operation in Burlington. In a pay list of the Champlain Glass Company for 1835 appear the names of two men known for company records to have worked at Chelmsford, Frederick S. Geer, glasscutter, and William E. Hirsch, blower. Hirsch, who went to work with his father at Chelmsford at age 16, was the eldest son of an experienced German glass blower, born in Bohemia, who had emigrated to America. The names of two other Hirsch family glassblowers, Charles and Francis, also appear on the 1835 Champlain list.[22]

Cylinder window glass blowing in a manner similar to that of the Champlain Glass Company. The seated worker has around his neck a wooden mask, called a "cowboard." This would be worn over his face for protection as he worked in front of the hot fire. Frank Leslie's Illustrated Weekly, *18 March, 1871. Historical Society of Western Pennsylvania Library and Archives, Pittsburgh.*

Along with his personal contacts, Foster contributed to the Burlington enterprise an extensive background in glass making. His years in the Boston glass works had given him the knowledge and experience to mix the metal so as to produce an outstanding product. As superintendent of the works at Burlington, he gathered under his control "about 100 hands"—the many skilled and unskilled people needed for a successful operation: blowers; cutters; box makers; men to tend the pots, the mix, and the fires; and laborers to cut and dry the wood, pack the boxes carefully with straw, keep the buildings in repair, clerk in the store, and other tasks.[23]

Beginnings of the Glass Works

Land records show that Foster was actively acquiring various properties in the north end of Burlington in the spring of 1827. In April he secured a block of four five-acre lots in the vicinity of Pearl and Champlain Streets. Three were purchased from William A. Griswold, Burlington lawyer and insurance man, and the fourth, a lease lot, secured for a yearly fee of ten dollars. Funding for the purchase of the three lots seems to have come from Foster's own resources plus a mortgage of $1000 furnished by Griswold. The next month, Foster, who may have been calling on his Boston connections for cash to finance construction of the glass factory, sold the block of three lots and his interest in the leased lot to John Bartlett, a physician from Roxbury, Massachusetts, for $2000. In May, Foster rented "all the tenements standing upon the land called the 'Cantonment' owned by the United States which is generally known as the 'Officer's Barracks.'"[24] The latter was the northern part of the old military camp in the vicinity of present day Battery Park. He also leased for a period of five years water lot number 70 at the foot of Pearl Street, giving the company access to the lake and a site for a wharf. The Champlain Glass Company, after incorporation in October, purchased the block of lots from Bartlett in November of 1827, at which time the property was listed for the first time as "the site of the glass factory."[25]

The spring and summer of 1827 was a time of great activity at the glass works site. Laborers, both skilled and unskilled, prepared the site, erected buildings, and gathered necessary materials. Teams of work animals were kept busy. A line of log pipes (in use until 1850) was laid to the factory from springs near the site of the residence of Henry Loomis on Pearl Street. Later a windmill was installed at the top of the embankment to pump the water for washing the sand and other purposes.

Ammi B. Young's map of 1830 shows a cluster of about six good-sized buildings between Water and Champlain Streets labeled "Glass Works." A large, octagonal building, probably containing the main fur-

nace, appears in the drawing with an open yard fronting on Champlain Street. Across the street are scattered smaller buildings, perhaps homes of workers or others connected to the company.[26] Original papers of John Johnson, a local surveyor, builder and engineer, contain several plans for frame buildings for the Champlain Glass Company, including a combination store and house. An additional clue to the layout of the compound comes a few years later from a map and inventory by Johnson of structures, contents and value of the buildings. This map shows a "flatting" shop, a combination cutting room/packing room building ("glass therein . . . 400 [dollars]"), a pot shop of two stories, a store and, the largest building, a barn. The barn contained horses worth $500, as well as carriages, harness, saddles and buffalo skins.[27]

Johnson's papers also include plans for a wharf and railroad as proposed by J. S. Foster, agent, entitled "Wharf Calculations for Glass Co—11th March 1828." This detailed estimation with an accompanying sketch shows that the wharf was to be 300 feet long (the length of a modern football field), 30 feet wide, and floored at the bottom with round and squared timbers, the whole to be filled with sand. Extending up the hill, "say 400 feet," the railroad plans called for three timbers laid longitudinally and then timbers sixteen-feet-long closely laid across.

Wood Ashes.

CASH given for good HOUSE ASHES at the *CHAMPLAIN GLASS WORKS*, near the U. S. cantonment ground. A supply of clean

White Sand,

is wanted for the above works; and a premium of *TEN DOLLARS* will be paid for information of a bed, the quality and situation of which will lead to its permanent use.

CLAY,

suitable for *Melting Pots and Fire Bricks*, is also wanted, and a premium of *TEN DOLLARS* will be given for information of a bed which shall supersede the imported clay for these purposes. Samples may be sent to the works.

JOHN S. FOSTER, *Superintendent.*

Burlington, 1st *Aug.* 1827.

CHAMPLAIN

Window Glass

THE subscriber offers at his store, wholesale and retail, a general assortment of *GLASS*, of first and second qualities, made at the new works in this place. The thickness, brilliancy and color of this article give it a decided superiority over any other cylinder glass in the market; and purchasers will have the additional advantage of receiving it well sorted and packed, and every light whole,

Clock, Coach & Picture Glasses, Fan-Lights and Ovals,

cut at short notice. Merchants and others are requested to call and examine for themselves.

Also, for sale, a few *GLAZIERS' DIAMONDS*, of superior quality.

JOHN PECK, *Agent for the Champlain Glass Company.*

Burlington, Oct. 30, 1827.

Left: Crucial raw materials were constantly needed. This ad first appeared in the summer of 1827 as the company prepared to begin operations and ran continuously for several months. Burlington Free Press, *1 January, 1828. Right: Announcement of company opening and advertisement for its window glass.* Burlington Free Press, *2 November, 1827.*

On these cross timbers would be rails of square timber "for the wheels to run on." A list of all necessary timbers and other materials includes quantities and costs. The railroad would have carried goods up and down an incline 446 feet long to a height of 112 feet above the lake. Although a good wharf was very important for the success of glass companies located on the water, perhaps the cost—$1300—and the fact it was to be built on land not in their possession, proved too ambitious for the young company and they decided to use existing facilities. Whatever the reason, the wharf and railroad at the foot of Pearl Street were never built.[28]

In preparation for the opening of business John Foster advertised in the September 14, 1827, issue of the *Burlington Free Press* that the Champlain Glass Works would pay cash for "good house ashes" and premiums of $10 for information on a bed of suitable white sand and a bed of clay to "supercede the imported clay for (melting pots and fire bricks). Samples may be sent to the works."[29] Ads continued to run weekly for these constantly needed materials.

The company was ready for business by October of 1827. Two notices in the *Burlington Free Press* on November 2, 1827, one from Foster and the other from Peck as agent, confirm full operation and offer glass for sale made "at the new works in this place." The newspaper welcomed the new operation with enthusiasm, congratulating the owners and declaring in a column entitled "Champlain Glass Works": "The successive melts have produced glass of a superior quality; . . . the proprietors intend to give us a thicker and better article than the miserable trash from the west which has been selling among us." The editors pointed out that value would now be given to local resources formerly "useless," that is, non-income producing.[30] The other Burlington newspaper, *Northern Sentinel,* belatedly took notice of the new enterprise on November 16:

> the curiosity of our citizens has been highly excited and amply gratified. The glass is of a superior quality and that part of it which is designed for elegant houses, not inferior in thickness or brilliance to the celebrated "Boston Crown", the parent and pride of American glass works. . . . The workmen employed are mostly young men of good habits and calculated to make useful citizens—and a spirit of order, industry and economy pervades the whole establishment, which could hardly be expected from one so young and so rapid in its growth.[31]

By the following summer the glass company general store had opened. A notice dated August 14, 1828, appeared in the newspaper and announced "a NEW STORE and NEW GOODS Just received from New York, and for sale at the *GLASS FACTORY STORE* on the corner of Champlain and Pearl Streets, near the Glass Factory, a general assortment of DRY GOODS."[32]

Glass Company Products

Champlain Glass manufactured window glass in various sizes and grades indicated by different names such as Burlington, Burlington Extra, Vermont, Essex.[33] At its height the company produced nearly 12,000 boxes of window glass yearly in standard sizes and cut-to-order, and, presumably, also furnished many of the fan lights and oval windows found in Burlington dwellings erected while the company lasted.[34] These ornamental windows, especially, required custom cutting and the skill of a good glass cutter. Champlain glass was known for its superior thickness, brilliancy and color, these qualities being championed in the company's advertisements. Although the more common 7- by 9-, 6- by 8-, and 8- by 10-inch panes in many Burlington homes built in that era and still standing keep their secrets as to their origin, many must be Champlain glass. We know from advertisements in 1835 that Follett, another major wholesaler in Burlington, was also selling these sizes made at the local company.[35]

It is possible, but unlikely, that Champlain Glass also produced commercial hollowware such as bottles, although the metal (mixture) for window glass was suitable for this application. However, no records exist of notices, advertisements or examples of bottles for sale. It is certain that the blowers made so-called offhand or end-of-day pieces, including tableware and "curiosities" blown for their own use by the craftsmen after hours from left over window glass melt. Some years after the factory closed, a doctor, writing about his visits to Burlington as a child in the 1830s, recalled: "a place of great interest—a visit at night to the old Glass Factory to see it while in blast and the curiosities that were blown."[36] These curiosities may have included the fanciful twisted hollowware canes that glass blowers traditionally blew for themselves. Levi Smith, a descendent of Fred Smith, said he had heard that these did exist.[37]

A story that appeared in the *Burlington Free Press* years later concerns an unusual bottle that Champlain Glass had made. In the course of construction of the glassworks a local hotel proprietor stopped by to note progress. He proposed to fill the first bottle blown at the works with the best in drink his house afforded, as thanks to the new industry. Shortly after the glass blowers began production, the hotel owner was greeted at his door by a very large bottle, the contents of which would measure over a barrel. Taking it in stride the owner ordered the bottle filled. Liquor was hauled up out of the cellar thus proving that his word was "no scrap of paper."[38]

The Glass Company 1828–1834

In 1828, the one-year-old Champlain Glass Company was busy producing glass and advertising in the local papers. On October 2, 1828,

the *Burlington Free Press*, under the heading "The American System," extolled the company's virtues in an article that gives us insight into the impact of this enterprise on the community:

> A few facts will do more to establish the importance of domestic manufactures than all the declamation which has wasted our money and exhausted our patience on the floor of Congress. . . . The Champlain Glass Company have disbursed money during their brief existence, to an amount equal to the whole of the capital of our banks, even the oldest. The distribution of so much money in a place where a large portion of the trade is barter is felt by almost every individual, in the facilities for payment, or exchange.
>
> Another view of the subject is interesting—our lumber, pearlash, and lime, find a home consumption—our wood, much of which would long have obstructed settlements and cultivation is rendered productive and fields of wheat are succeeding the forests which the farmers were else unable to clear; and lastly our mountains are yielding their inexhaustible beds of sand and clay to the alchemy of industry which converts whatever otherwise cumbers the soil into something better.[39]

That year Congress passed an even stronger tariff bill, known as the "Tariff of Abominations," and, although a controversial issue in the country as a whole, the tariff surely helped the fledgling glass works. Again the newspaper praised the company in an October, 1829, article for "giving employment to many of our poorer families, particularly in the winter months, when such employment is most desired." It went on to say, "[T]he business is reduced to a cash standard—the hands punctually paid and the money distributed in small sums. The quality of the glass is unquestionably the first of its kind and bears the highest price at home and abroad . . . this factory has now nearly the whole supply of those parts of Vermont and New York which border on the lake."[40] The Champlain Glass works was also gaining state wide recognition. In an article reprinted in the *Burlington Free Press* the *Bennington* newspaper extolled the superiority of its window glass and mentioned the company's use of sand from nearby Dorset.[41]

In Burlington the company became involved in the town's volunteer fire-fighting efforts. After the court house on the square burned in June, 1829, and the *Burlington Free Press* called the town's firefighting forces "feeble,"[42] fifty-six townspeople rallied to subscribe a total of $251.50 to purchase fire engines. Foster, Dean, and Peck were among the contributors. Later, in February of 1830, John Peck was one of three persons appointed to raise and organize engine companies of firefighters for each of the three new fire engines. Peck was responsible for the engine located near the Champlain Glass Company.[43]

In early 1830, the company bought one hundred acres of land in Colchester. This was probably a wood lot to help satisfy the unending need for fuel. The company also purchased a one-third part, or five acres, of the camp ground or cantonment lots when the government put them up for public auction that year. In May, 1830, at a regular meeting of the company, John Foster was authorized to sell several plots of land in the vicinity of Champlain Street to various glass workers. One worker was Peter Strook (Stroak), who purchased a one-half acre of land on which he had built a house for $100. Jemima Smith, Frederick Smith's mother, purchased a one-quarter acre lot. Perhaps the purpose of these sales was to raise cash for the company.[44]

An ominous turning point for the company came in 1831. At the annual meeting in January the Champlain Glass Company, led by Mr. C. W. Corning, voted to borrow $4,800 from President John Peck and Treasurer James Dean, with the company itself to be used as collateral. The details of this action were as follows:

> At a meeting of the Champlain Glass Company 12 Jan y [sic] 1831. On motion of Mr. C.W. Corning it was then voted that the Superintendant be directed to make and execute to John Peck and James Dean, two several notes promising to pay to each of them the sum of twenty four hundred dollars in six annual instalments, embracing $400 of the principal and all the interest, and that he be further directed to make execute a mortgage deed of the Company's real estate and affix their seal thereunto, in favour of the said Peck and Dean, to secure the payment of the said two notes amounting to $4,800 and interest. This was then done in the presence of the company.
>
> Attest John S. Foster Clerk
>
> Read and approved Jn. Peck Prest.[45]

The reason for the loan and the mortgage of the company's property soon became clear. One month later the company became the principal backer of the Redford Glass Company, a new crown glass venture across the lake near Plattsburgh, New York. The Burlington company bought the first two lots associated with the new company, comprising 1,294 acres, for $1 an acre, followed six months later by an additional two lots for a total investment of $2,594. Leading the Redford Glass Company was Charles W. Corning, a member of the Champlain Glass board of directors who had made the motion to borrow the money from Peck and Dean, and his fellow Troy businessman, Gershom Cook. A further connection between the two companies was John S. Foster. The Champlain superintendent and master glassmaker had left Vermont early that year to oversee the construction of the Redford works, selling his Burlington house and property in March. After setting up the company across the lake, Foster became an incorporator and its superintendent, helping to

turn out the first lot of crown glass in October of 1831.[46] Champlain Glass had lost a valuable and experienced leader in John S. Foster and had saddled itself with a staggering debt load as well. The repercussions of the January, 1831, meeting would be felt for a long time.

Despite having a fire engine nearby, the Burlington glass works suffered another major fire in May of 1831 when an early morning blaze destroyed the furnace house. As reported in the newspaper the next morning, the loss was estimated at $4,000, all but $500 covered by insurance. The paper concluded, "We understand it is the intention of the proprietors, to rebuild without delay."[47] Despite the fire, the Burlington company continued to sell its glass. John Peck advertised two hundred boxes of Champlain window glass in the August 26 *Burlington Free Press* of 1831, though this may well have been glass made before the fire and stored.[48]

At some time in 1831, however, the glass company was reorganized. At the same time, Frederick Smith, now nineteen years old, was "relieved" of his agreement and apprenticeship.[49] Information is lacking as to the details of the company's action and the severing of Smith's agreement so it is not known if it was something he did or did not do that caused his departure.

Smith was then hired for what was reportedly a large salary to help a group of proprietors in Middlebury in their efforts to reestablish the Lake Dunmore Glass Company in nearby Salisbury. Two letters from Smith to the proprietors of the Dunmore works make it clear that he was arranging for blowers and other "hands" to leave Champlain Glass and come with him to the new company. It also illustrates the fierce competition for skilled glass workers. Smith refers to a "Mr. Foster" who is being "friendly to our concern," going so far as offering to import clay and diamonds (for cutting) with him that spring. This was obviously John S. Foster, his old boss and former Champlain superintendent, now at Redford glassworks, helping his young protégé.[50]

On March 15, 1832, Smith wrote from Burlington to Middlebury lawyers and backers of the revitalized Lake Dunmore glassworks, Linsley and Chipman:

> I have made some progress in engaging hands. Since I last saw you I have engaged Mr. Wetherbee & he has been discharged here in consequence of it & is now idle. I think it will be well to employ him at your works as soon as you can do it to advantage. I shall be at your place with him the first of next week. I have got six Blowers to sign a contract & one more has agreed to go but prefers not to sign at present. John Long has turned *traitor* & gone to Keene [NH] after Blowers for this [Champlain Glass] Company & probably will go from there to Clyde & Geneva [glassworks in western NY] in which case he will be

> likely to get some hands that we very much want and I have taken the liberty to say to Mr Clark that we will pay his expences and allow him as much for his time as he would make at work to go on and get the start of Long as no time is to be lost. The hands here are very much engaged & are very desireous that we should have a good set of hands & are determined not to be outdone by this Company. This Company have offered $1.50 for large & small & I have in consequence of that been obliged to give the same wages to secure them which is a little more than the first proposition & they pay their own moving expences.[51]

Three weeks later Smith wrote: "Weatherbee has concluded not to go down till his house is ready to take his family along with as the time is so near by—will you let me know what day his house will be ready—he will depend upon you to send two teams for his goods." He concluded: "I shall probably get my business arranged so as to go down about the middle of this month."[52] Frederick Smith remained at the Lake Dunmore works for two years.

In Burlington, the glass company was experiencing a time of turmoil and change. Obviously not happy with the "reorganization," many experienced workers were leaving or were discharged. One employee, Elijah Burroughs, a Champlain glass packer and box maker, wrote to Linsley and Chipman in April of 1832 seeking employment at the Dunmore factory. John Long, the above blower, "turned *traitor*," was apparently persuaded to change his mind about leaving by being given more responsibility (the opportunity to travel and recruit blowers for the company), and probably more money. In addition, later that year John Peck, president, transferred one-half ownership of his share of Champlain Glass Company stock certificate number one to John Long and James David, another blower, perhaps as further inducement to stay. In the case of Long, Peck's effort was to no avail, however; six months later Long was across the lake with his old boss John Foster, helping him recruit blowers for the recently established Redwood (New York) Glass Company.[53]

The Burlington glass company managed to remain in business despite internal problems and the nearby competition. In the summer of 1832 the company recovered its investment in Redford Glass when the Redford lots were sold to owners Cook and Corning for $2,594, the exact price paid by Champlain. In an April 26, 1833 advertisement Peck reassured customers that the "CHAMPLAIN GLASS WORKS are now in full operation and the company are manufacturing WINDOW GLASS of a quality superior to any cylinder Glass in New England."[54]

Frederick Smith, meanwhile, had kept in touch with John Peck. On a trip from Salisbury to visit his mother, Jemima Smith, in Williston, in January of 1834 he wrote her a hasty note from Burlington saying, "I intended to have gone to Williston tomorrow but Dr. Peck and Capt Thomas are going to Redford tomorrow to settle some of the old accounts with the Redford Co and cannot get along without my assistance . . . I cannot get away from going to Redford."[55] Later that year Smith and Peck entered into serious business discussions with the result that Frederick Smith, now twenty-two years of age, returned to Burlington and Champlain Glass where he and his business partners entered into a lease of the company. We learn of the details of the arrangements and their importance to Smith in a letter to his mother dated at Burlington, January 14, 1835.

> I have delayed writing you for a long time in order that I might be able to let you know my prospects of business. I have for 2 or 3 months been trying to Rent the Glass Works at this place and have at last accomplished it. Geo Loomis of Salisbury, myself & others have Rented the Glass Works for 1 to 3 years and have got them in good repair & commenced blowing the 5th Inst. and our prospects now look fair for doing a good business. Geo Loomis has moved his family here and lives in the house that Mr. Wetherbee used to occupy and I am boarding with him.[56]

Loomis, Smith & Company

The corporate name of the Burlington glassworks was now officially Loomis, Smith & Company though they continued to do business as Champlain Glass. Loomis was an incorporator of the Lake Dunmore glassworks and son-in-law of the lawyer and company backer George Chipman to whom Smith refers in earlier correspondence with that company.

An informal expense sheet of Smith's entitled "Exps.1 Month for 6 Pot Furnace," although undated, includes rent payment. We can, therefore, assume it concerned the period of time when Smith was leasing the company. It gives us valuable clues to the size and extent of the operation and the labor and materials used. It itemizes eighteen mixings a month, one hundred fifty cords of wood to be bought at $2 per cord, rent of $33, and taxes of $5, for a total cost, with other expenses, of $1,600.[57]

The operations of the revitalized company were off to a good start and Fred Smith must have shared this news with his mother, for she wrote him in April of 1835 "It gave me great pleasure to hear from you and that you are prospered in business," but with motherly concern she adds, "I think your own experience has taught you the disappointments and crosses we are liable to meet with in this world . . . remember there is a never ending eternity beyond this life and may it lead you to Trust in the Lord . . . he Shall direct thy paths."[58] Fortunately for Smith the prosperity continued. The lease of the company lasted three years during which time, according to the historian Rann, the establishment be-

came a decided success.[59] With the financial aid of Dr. Peck, Smith then bought out the business.

These were prosperous times. A number of manufacturing companies started up in Burlington around 1835. The Farmers' and Mechanics' Bank in Burlington had been founded with Dr. Peck as its first president. Glass manufacturers as a whole in the country were doing well. In a book of American trades and professions published in 1837 the author concluded his section on "The Glass-Blower" by saying that, though the glass manufactories were not successful in the beginning, due to inexperience and competition from imports, "adequate protection having been extended to this branch of our national industry, by the tariff of 1828, it is now in a highly prosperous condition—so much so, that importations of glass-ware have nearly ceased."[60]

In 1836, the Burlington company employed an agent in Troy, New York to sell its glass. A Jan. 1, 1836 flyer found in an attic in that vicinity over one hundred years later, had been issued in Troy by Larned and Corning, general agents of Champlain Glass. It solicited the attention of builders, contractors, manufacturers, dealers in window glass, and others to the "superior" Champlain window glass whose quality "has been greatly improved" and to the "liberal terms" of the company.[61]

An account book in the Special Collections at the University of Vermont entitled "Pay List. No. 1. Loomis Smith & Co." lists payments to the glass factory workers on a monthly basis from 1835 to 1837 and shows credits and debits to each worker at each pay date. A study of this book yields information on many subjects. For each worker the credit side of the ledger shows the work performed, the span of days or months in which the pay had been earned, and a few other credits. The debit side includes the worker's store account, rent owed, and notes or money owed to other workers. These credits are followed by the cash disbursed, if any, and the worker's signature or, if he could not write, his "mark," an "X" by his name. In many instances the per-day, per-month or per-piece rate is included, which makes this an interesting study in wage rates. By the amount of money paid for a certain job one can discern how valuable the different tasks were and perhaps judge something about the skills needed to perform them. The time actually spent on each job was precisely measured, such as 12/30 month, or, in another example, 1 and 24/30 months. It can be surmised that the workers spent twelve hours a day on the job because the time worked on one job is listed as being twenty-six days plus a partial day of ten and one-half hours out of a possible twelve. In many of the early glasshouses employees worked six-hour split shifts (two six-hour shifts with six hours in between), and this may have been the case in Burlington.[62]

TABLE 1 Summary of Jobs and Wages as Shown in Account Book

Type of Job	*Rate of Pay*
Stoking and "on ovens"	$20.00/month
Master stoking	$30.00/month
Wood drying	$25.00/month
Labor in mixing room	$22.00/month
Making salts	$17.25/month
Labor	$16.00/month
"Services"	$13–14.00/month
Grinding sand	75 cents/day
Work in pot room	60 cents/day
Small glass (cutting)	$1.00/thousand panes of glass
Large glass (cutting)	$1.25/thousand panes of glass
Cutting boxes	10 cents/box
Packing boxes glass	1.5 cents/box

A survey of the pay list reveals other information too. In July of 1836 John Morrison was listed as earning $79.42 for work in the mixing and pot rooms. Just below this entry is a $5 deduction "for getting drunk." Morrison received his pay of $74.42 (minus debits) on 14 July, signing with his mark, "X." Perhaps it was a moral stand—this was during the zeal of the temperance movement and Fred Smith, according to his obituary, was the first merchant to discontinue the sale of liquor in his store. Or it could have been that Morrison was drunk on the job. For the important steps of preparing the materials for mixing and making the pots, a sober man was needed, sure on his feet and steady of hand.

A list of some other jobs at which the men worked and the wages for each illustrate the many tasks necessary to produce the glass.

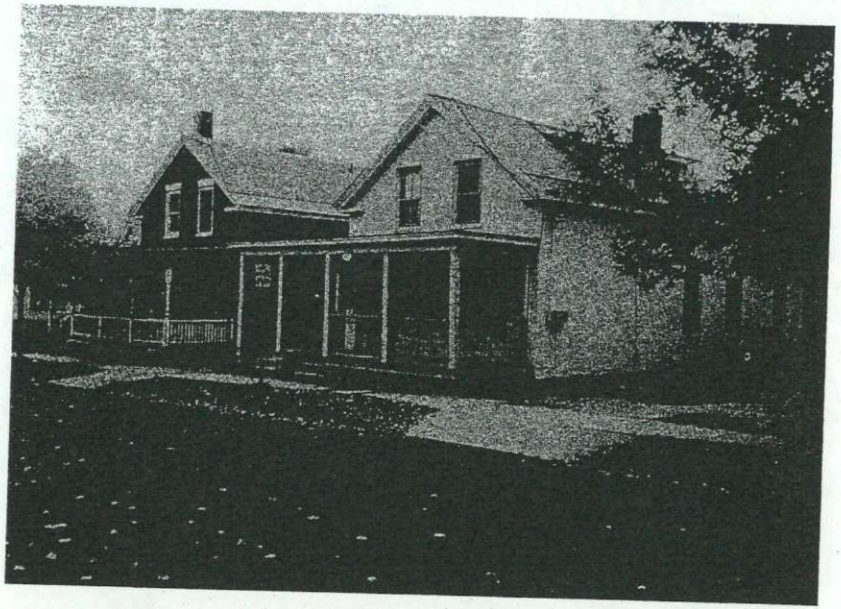
Other tasks included sawing and splitting wood, making melts, flattening, and tending kiln and glass blowing.

Pay for each glass blower was listed by month and work hours varied from month to month. In 1836 glassblower Charles Hirsch earned $56.00 for April, $53.12 for May, and $68.31 for June. In March of that year E. Vosburgh earned $39.88 and in February, $46.62. Hirsch earned only $21.37 for blowing in March, considerably less than his earnings for the following three months; while it was obviously the highest paying job, earnings from glassblowing depended on time on the job or other factors.[63] Glass blowing had traditionally been a craft passed on from father to son, with the formulas for processing the metal kept secret. Apprenticeships usually lasted seven years. It was hard work, one author describing the glassmaker as "sweating half-naked in front of a furnace with a hot and heavy cylinder at the end of his blow-pipe."[64] He must be

ready to be called at any time of day or night according to when the metal was ready to blow.

Glass Company Houses

Experienced glass workers moved often, responding either to the availability of fuel or the lure of better contracts. In order to persuade the much sought after workers to come to a particular location it was usually necessary to provide them with living accommodations and, often, moving expenses. The contract that blower Francis Hirsch had signed while working at Chelmsford Glassworks called for the proprietors to furnish a house for each blower, or allow $6.00 per quarter to those who did not require one. The Loomis and Smith pay list shows rents deducted for some of the workers, usually of $2.50 or $3.00 per month. In a plan found filed in John Johnson's original papers and entitled "Champlain St North of Glass factory," two houses on that street are identified as belonging to Francis Hirsch. One may have been a rooming house for the workers. This plan, probably for insurance purposes, contains information on the size and value of contents of the houses and barns, with Hirsch's barn noted as "well finished and painted,"[65] reflecting most likely the relative prosperity his blower's wages earned.



Company houses still stand on George Street, Burlington.

Real estate development proceeded at a more rapid pace in the north end of Burlington because of the glass company. Land was purchased and houses built so that the workers could live near the glass factory. The Burlington map of 1839 identifies the area west and north of Champlain Street as "Glassville."[66] George and Charles Streets were laid out. Under contract with the town, Fred Smith was responsible for the laying out of Battery Street north of Pearl in 1842, Front Street, and several other streets in that vicinity. About 1835 the company built several small brick houses on George Street for its workers and the houses are still standing. Also standing is the house at the northeast corner of Park and Sherman Streets (formerly Smith's Lane) that Smith built around 1840. In 1836 he had married Mary Curtis Foote from St. Albans and they had started their family, eventually to number five children. Family members remember that there was an orchard in the yard between the family house and the house that the Smith's son later built further down the street. Another company house remarkable for the carved fanlight in the gable can still be seen at 18 Park Street, across from present day Battery Park.

John Peck and James Dean vs. Champlain Glass Company

The glass company's debt to Peck and Dean from 1831, which had been secured with a mortgage on the company's property, had not been paid as promised (except for a portion the first year). Thus, in December, 1835, the two men filed a complaint at Chittenden County Superior Court alleging that "the Champlain Glass Company combining and confederating to and with divers persons at present to your orators (Peck and Dean) unknown . . . do pretend and give out in speeches that (the company) did not owe . . . the money specified in the promissory notes." Peck and Dean alleged further that when the "Company with their confidantes admit that said Company was indebted to Peck and Dean . . . they pretend that said notes were well and truly paid according to their time and effect and that said mortgage was long since cancelled and discharged." Champlain Glass did not appear or make any answer or defense to the charges so the court decreed at the following session in January, 1836, that Peck and Dean were to be paid a total of $4,153.30 plus court costs by January 12 of the following year or Champlain Glass would be foreclosed, which is what happened. Peck and Dean received title to the company "free and clear."[67]

In February of 1838 Smith, with his new partner twenty-nine year-old William H. Wilkins, Jr., a freight forwarder at the lake and former Champlain Transportation Company steamer captain, bought John Peck's half interest in the glass company for $3,000 with Peck holding

the mortgage plus additional acreage in the area, to be followed a year later by the purchase for the same amount of the remaining (James Dean's) half of the glass factory.[68] Just before this final purchase, the glass factory, now under the legal name Smith and Wilkins Company, suffered yet another fire. Reporting on plans to rebuild, the *Burlington Free Press* on December 28, 1838, referred to the improvements the proprietors had made in that part of town: "Already a number of rickety and combustible shanties connected with the factory have given place to substantial brick & stone enclosures and we learn that it is their intention to extend this reform throughout."[69]

The Glass Company Continues

The Burlington glass works continued with Frederick Smith at the helm. He took on new partners, reflected in the changing corporate names of the company as associates came and went, though they continued to do business as Champlain Glass. One of his descendants, Levi Smith of Burlington, described him as "a fighter. His partners got scared and ran away when the bottom dropped out of their business."[70] Levi Smith also recalled that Fred had a hard time with a gang of tough laborers brought in from the outside in the early years. Fires, financial panics such as the disastrous one of 1837, competition, labor problems—these all tested the resolve of Smith and his glass manufacturing partners.

By 1840 the company seemed to be enjoying success. In the census that year it reported $15,000 capital with forty employees producing $30,000 worth of glass, one of only three businesses in Burlington producing significant products for out of state markets.[71] An additional piece of property, the 225-acre Walker farm in Williston and Burlington in the vicinity of Muddy Brook had been purchased the year before for $6,000, with a down-payment of $500 and a five-year mortgage. The farm became known by the name of the "Glass Factory Farm" and was evidently a source of the much needed wood for fuel, because two years later Smith and Wilkins leased "a Saw Mill, Mill Yard together with all tools and machinery of said mill . . . on Muddy Brook." Perhaps to finance the farm purchase and other company operation costs, Smith and Wilkins sold lots near the glass works to no fewer than fourteen glass company employees in 1839 and 1840, at least one of the lots being "the same place as (the worker) now resides," with mortgage notes taken back on most of them. They and two partners also sold to the town of Burlington nine acres at Water and Pearl Streets for $400, establishing what is today Battery Park, with the important proviso that it be "used, held, enjoyed and improved as a public Common and highway forever and for no other purpose."[72]

Agents in Chicago and elsewhere distributed and sold Champlain glass, suggesting a large western trade. An important improvement in 1841 enabled freight to travel without handling all the way through to New York City and to the west, thus reducing loss by breakage and saving shipping time. That year the Merchants' Line was established by the Burlington wholesale firm of Follett & Bradley. This line pioneered a development in canal boats. Built like sloops, the new boats could sail to Whitehall where the mast and sail could be taken out so the boats could continue through the Champlain Canal and on to New York City by steam tow boats. Smith and Wilkins established their own line of these cargo carrying "long boats," the "New York and Canada Line," which carried on a good business until the railroads forced it to cease.[73] One of the glass company's account books contains records of tickets being sold, presumably on this line. The ledger book for 1847–1848 shows that glass was being shipped on consignment to stores in Canada and locations in several states besides Vermont: Salem, Northampton, Pittsfield, and Concord in Massachusetts; Hartford and New Haven in Connecticut; New York City (several dealers), Buffalo, Troy, and cities across the lake in New York State and Portland and Bangor in Maine.[74]

The 1844 price list from Smith & Wilkins showed the current wholesale prices of Burlington window glass and the three most common sizes: 6- by 8-inch, which ranged in price from $2.75 for the better grade "Burlington Extra" to $1.50 for "Lake," each box containing 150 lights; 7- by 9-inch, $3.00 to $1.75 for a box of 114 lights; and 8- by 10-inch, $3.00 to $1.75 for a box of 90 lights. Thirty-two additional sizes were available, larger and more expensive, the largest size being 24- by 18-inch. The price was per box of fifty feet of glass and payment terms were four months. At this wholesale level a penny could buy a 6- by 8-inch pane of glass.[75]

In 1846 Smith and Wilkins made the major decision to move the company to St. Johns, Canada, the busy customs house port at the northern end of navigation from Lake Champlain with train connections to Montreal. In an agreement dated August 1, 1846, they entered into an equal partnership with four other parties (two from St. Johns and two from Montreal) for the term of five years, the purpose of which was "carrying on business at St. Johns CE [Canada East] of Manufacturing Glass, trading in Merchandize, or any other business . . . for the advantage of said company." They each put in the sum of £1,000, equal to $4,000, giving them working capital of $20,000, with which the partners agreed to purchase from the former Smith and Wilkins Company "all their Real Estate, Tools, Horses, Waggons, etc." for $15,000, and also all their stock of materials on hand, "Soda Ash, Wood, Clay etc. at their cash

value or actual cost." The glass was to be manufactured under the name and firm of Smith Wilkins and Co. and Fred Smith was to be manager, "devoting his whole time and attention to the business" at an annual salary of $1,200. Another partner, Charles Seymour, would manage the store. Smith had apparently moved to St. Johns, as the Canadian town was listed as his residence, and his only son, Charles, was born there the following March. William Wilkins remained in Burlington.[76]

A major reason the Burlington glass company decided to move north may have been the availability of wood for fuel. In 1843 the Chambly Canal had been built around the twelve miles of rapids on the Richelieu River just above St. Johns, allowing a "seemingly endless outpouring of logs"[77] to come from the Canadian forests, whereas in Vermont that same year the local lumber resources were considered exhausted. When the company sold the "Glass Factory Farm" in Williston to Samuel Brownell at the end of 1846 the purchase price was $3,500, or $2,500 less than the company had paid for it seven years before. Perhaps this was because all the wood, now more valuable and scarce than ever, had been logged off the property.[78]

In Burlington the company took on another partner, Ralph Landon, a twenty-nine year-old merchant who was manager of the company store and co-owner with Smith of much land in the north end of town. The Smith Wilkins & Landon ledger of 1848 is a fascinating source of information about business and company life. The ledger illustrates the role of the company store in the everyday buying and selling of local commodities and the barter system at work. The store purchased lumber, salt, pork, salmon, muslin, ashes, corn, wood, lime and other items. Glass company employees bought goods on credit and paid for them by work. One transaction reveals that Jacob Lagrange paid for meal, corn and postage "by blowing."[79]

As the year 1848 progressed, however, it appeared that the company store, and possibly the glass company itself, were closing up business. In a notice dated June 15, Ralph Landon & Co. announced in the *Free Press* a "Business Removal—The Subscribers have removed their Goods from the Store lately occupied by them near the Glass Factory" to the former Follett store at the head of Champlain Wharf. The list of stock "a greater variety than at any other store in the vicinity" does not include glass. Another *Free Press* advertisement dated April 2 that year announced that Hervey Burnett, employee at the glass company, was going into business for himself—"opening of Glaziers Shop!!" The last ad found from J. H. Peck for the sale of Champlain glass was for 2,000 boxes of glass in the various grades on April 1, 1848.[80]

The company ledgers and record books indicate accounts being settled, closed or transferred. The glass workers numbered about a dozen as judged by the accounts at the company store, and the amount of credit the men earned by work dwindled, especially for the glass blowers. Some of the same men from the 1835 pay list appear still working at their trade. The last entry for the glass workers as a group is June, 1848, when the store closed. Listed are F. Hirsch, Jac. Lagrange, Jn. Marks, S. H. Baker, B. Shattuck, A. Baty (all blowers), and L. Manning, G. H. Bostwick, Angelo Wicker, R. Lillie, L. Wagner, and Joel Lund. Another ledger shows a flurry of activity in 1848 as whole pages of debts and credits are recorded covering transactions from June through October 1, 1848 when the final tally shows a $5,260.51 credit "By Balance on settlement to date." After a few more minor entries the account is ended with the January 4, 1849 entry: "By Balance to Seymour & Co. a/c transferred—Credit $1,054.11." Charles Seymour was the partner designated to run the St. Johns company store.[81]

Whatever hopes Smith and Wilkins had for the new partnership in Canada seem not to have worked out. Land records do not show the sale of the glassworks real estate, except for the farm, and, by 1849, Fred was back in Burlington. The story passed down, according to a Smith descendent, was that one of the partners "absconded with the cash."[82] Another explanation could lie in the fact that the town of St. Johns was about to be bypassed as the premier entry into Canada by the coming of the railroads and the choice of Rouses Point on the lake near the border as the connecting railroad and steamboat terminal for Montreal-bound traffic. Historic St. Johns became a "ghost port" when the first train came through from New York in 1850, resulting in financial ruin for one of Smith and Wilkins' Canadian partners, Jason Pierce, a prominent and well-respected St. Johns businessman who, to his distress, correctly foresaw his previously thriving business as a forwarder there disappear overnight.[83]

The U.S. Industrial Census for Vermont for 1850, which included names of corporations, companies or industries producing articles to the annual value of $500 or more, does not include the Champlain Glass Company or any glass making concern in the area.[84] There are, however, thirteen individuals, including Smith, in the 1850 Population Census of Burlington who listed their occupation as related to glass making, including blowing (five), cutting, and flattening. Most of these names appeared on the glass company ledger book in 1848, though a glass blower from that list gives his employment as a mason in 1850. Another former glass cutter lists his occupation as "none" (unusual because most of the time the space would have been left blank), and there is no mention of the numerous Hirsch glass-blowing family. Seven of the thirteen glass men listed in the census were property owners, not common at

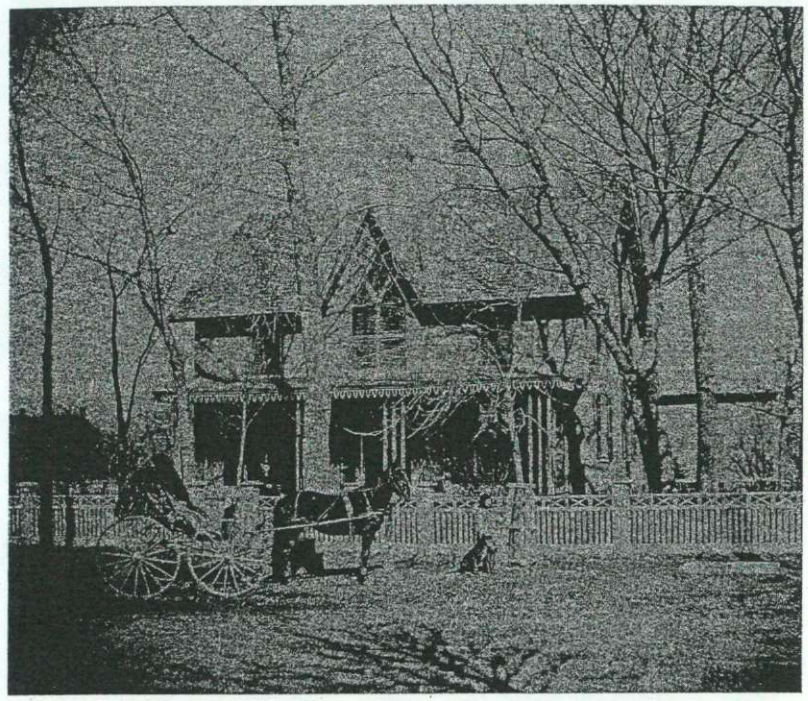
that time, indicating the high wages and economic status of glass craftsmen. Fred Smith listed his occupation as manufacturing glass and his worth in real estate as $10,000.[85]

By 1850 the glass company had gone out of business. Certainly the dwindling supply of wood was a major factor. Coal was now available and more economical, and the glass industry strengthened in the Pennsylvania area. Those glass manufacturers were also nearer to the market centers and the expanding West, which made it almost impossible for the Vermont company to compete pricewise. The lake advantage was gone and the era of the railroads had dawned. For the glass manufacturers the coup de grace was the downward trend of tariff duties in the 1840s, which resulted in cheaper imported glass flowing into the country again. European glass could be purchased for less than it cost the local manufacturer to produce.[86]

According to family sources, Fred lost a lot of money and had a "tough time paying off his debtors."[87] His mortgage for the glass factory property to John Peck, who himself had gone bankrupt, was finally paid off in 1855. Small consolation for him, but Fred Smith was only another example of the continuing struggle for success of American glass manufacturers. Citing examples in various locations, one author has stated, "Almost every effort to create a full-fledged glass industry in the United States seemed doomed to failure" until the successful reorganization of the Pittsburgh Plate Glass Company in 1883.[88]

Fred, thirty-eight years old in 1850, became involved in other projects. He was one of the founders of the Burlington Aqueduct Company and, in 1852, became a leader and managing director in a stock company that raised money for the establishment of the Pioneer Mechanics Shop, a large building on the waterfront that provided space for a variety of manufacturers. Because Fred had seen the results of high unemployment when a major employer like the glass company goes out of business and takes other businesses with it, he worked to provide for diversified industries in Burlington. But this venture did not work out financially for him either and in June of 1856 all the numerous plots of land that he and Ralph Landon owned in the north end of Burlington near the glass factory were sold at public auction.[89] Fred went into the lumber, feed and grain businesses, joined eventually by his son, Charles P. Smith. He retired in 1867 and lived on in his house on North Battery (now Park) Street, giving counsel to Charles as the young man entered the Burlington banking community. Fred died in 1892 in his eightieth year.[90]

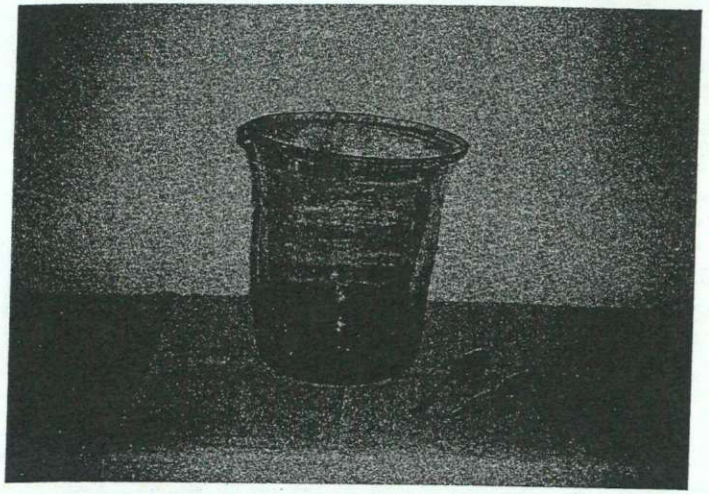
No evidence of the actual glass factory works, its furnace or related buildings, remains today. The company that was hailed as the most ex-



The only known picture of Champlain Glass Company proprietor Fred Smith, this undated photo was taken in front of his home on Water Street, Burlington. Fred is the elderly, bewhiskered gentleman in a top hat standing behind the fence. Courtesy Sybil and Levi Smith.

tensive manufacturing enterprise in the area upon its founding was gone, despite the "enterprising, diligent, temperate, hopeful" efforts of the men who were behind it. An era was over.

Only a few pieces of offhand glass attributed to Champlain Glass remain extant today. One is a wide-brimmed bowl, probably used as a milk pan, in the private collection of a Burlington resident. A similar bowl was given to the Fleming Museum in 1955 by a descendant of an original glass company worker, Robert Marks, who said it had been passed down in the family but this bowl no longer remains in the Museum's possession. It was described as "a large (dia.13″ ht 6″) bowl in greenish blue glass, one of the first products of the Champlain Glass Works."[91] A piece of "frit," or partially fused glass, of a sea green color is in the possession of Lilian Baker Carlisle, and the Shelburne Museum owns a rimmed glass bowl attributed to the local company. It appears that the



Fruit jar, milk pan, and glass frit, of greenish blue colored glass, Champlain Glass Company. These are rare examples of the "offhand" pieces blown from leftover window glass by the workers for their use or to give as gifts. Private collections.

last surviving piece of Champlain glass in the Smith family is a large jar (probably for fruit), approximately 18 inches high, of plain design with a rimmed edge, unfortunately broken at some earlier time as it was taken from a shelf and now patched together. It is owned by Dorothea Smith Hanna, granddaughter of C. P. Smith, Fred's son. Mrs. Hanna has confirmed that it is her understanding that Champlain Glass did not make much tableware.[92] Though it is difficult to prove the origin of old glass pieces, a check with several leading New England museums and the Corning Museum of Glass confirmed that they have no known examples of Champlain glass.

Notes

[1] John M. Weeks, *History of Salisbury, VT. 1860* (Middlebury: A.H. Copeland, 1860), 202. The reference is to Henry Schoolcraft, Superintendent of the early Vermont Glass Factory in Salisbury, Vermont.

[2] This project had its origins as a class paper I wrote in 1993 as part of the Historic Preservation program at the University of Vermont with Professor Thomas Visser. At that time my mother, Lilian Baker Carlisle, shared information that she had collected on the Champlain Glass Company, including material from David Blow, which helped me begin the project. I thank my mother and David Blow for help and encouragement. Thanks also to my husband, James Inman, for his technical assistance.

[3] *Laws of Vermont (1827)* Act 43, sections 1–9, 78–80.

[4] Warner McLaughlin, "Glassmaking in the Champlain Valley and Northern New York," *Vermont Quarterly* (January 1946): 8.

[5] W. S. Rann, *History of Chittenden County, Vermont* (Syracuse: D. Mason & Co., 1886), 419.

[6] *Burlington Free Press*, 20 January 1849. Dean obituary.

[7] Abby Hemenway, *Vermont Historical Gazetteer,* vol. 2 (Burlington, Vt: A. M. Hemenway, 1867), 693.

[8] Helen McKearin and Kenneth M. Wilson, *American Bottles & Flasks and Their Ancestry* (New York: Crown, 1978), 52. Also see Kenneth M. Wilson, *New England Glass and Glassmaking* (New York: Thomas Y. Crowell, 1972), 84.

[9] Clinton County Historical Association, *REFLECTIONS—The Story of Redford Glass* (Plattsburgh, 1979), 8. Redwood Glass Company Papers, Jefferson County Historical Society, Watertown, N.Y.

[10] Abby Hemenway, *Vermont Historical Gazetteer,* vol. 1 (1867) 669.

[11] "Smith Family," *Life*, 1966.

[12] *Burlington Free Press*, 28 January 1892. Smith obituary.

[13] Arthur M. Schlesinger, Jr., *The Almanac of American History* (New York: Bramhall, 1986), 216.

[14] Kenneth M. Wilson, *Glass in New England* (Sturbridge: Old Sturbridge Inc., 1969), 3.

[15] McKearin and Wilson, *American Bottles & Flasks*, 9. Also see Edward Hazen, *The Panorama of Professions and Trades; or Everyman's Book* (Philadelphia: Uriah Hunt, 1837), 241–242.

[16] Zadock Thompson, *History of Vermont, Natural, Civil and Statistical in Three Parts, with a Map of the State and 200 Engravings* (Burlington: Goodrich, 1842), 38.

[17] Many years later Judge Torry Englesby Wales recollected that as a child in 1829 he had visited Burlington to see the steamboats when "my father had occasion to come to Burlington with a load of salts and potash for the glass works." *Burlington Free Press,* 18 May 1899. Also see Rann, *History of Chittenden County,* 309.

[18] Charles A. Young, *Travels in North America During the Years 1834, 1835, & 1836* (New York: Harper, 1837), 3.

[19] Lura W. Watkins, *American Glass and Glassmaking* (Southampton, N.Y.: Cracker Barrel Press, n.d.), 10.

[20] Hazen, *Panorama of Professions*, 241.

[21] McKearin and Wilson, *American Bottles & Flasks*, 7. Also see Hazen, *Panorama of Professions* 242–243.

[22] Wilson, *New England Glass and Glassmaking*, 86; Champlain Glass Company Pay List 1835, Special Collections, Bailey-Howe Library, Burlington, Vt. See also Hirsch family papers at Chelmsford (Mass.) Historical Society.

[23] Lilian B. Carlisle, editor, *Look Around Burlington, Vermont* (Burlington: Chittenden County Historical Society, 1972), 8.

[24] Burlington Land Records, 19 May 1827, vol. 8, 349.
[25] Burlington Land Records, 23 April 1827, vol. 8, 347–348; 31 May 1827, vol. 8, 354–355; 7 November 1827, vol. 8, 426.
[26] Ammi B. Young, 1830 Plan of Burlington Village, Special Collections, Bailey-Howe Library.
[27] John Johnson, John Johnson Papers, Special Collections, Bailey-Howe Library. The map of the glass factory site is undated but must be 1839 or later because it identifies Smith & Wilkins as owners.
[28] Ibid.
[29] *Burlington Free Press,* 14 September 1827.
[30] *Burlington Free Press,* 2 November 1827.
[31] *Northern Sentinel,* 16 November 1827.
[32] *Burlington Free Press,* 15 August 1828.
[33] "Wholesale Prices Current of Burlington Window Glass," 1 August 1844, Special Collections, Bailey-Howe Library.
[34] Carlisle, *Look Around Burlington,* 8.
[35] *Burlington Free Press,* 8 May 1835.
[36] S. Hayes, "Fifty Years Ago," *Burlington Free Press,* 6 October 1887.
[37] Levi Smith, telephone interview by author, 15 October 1993.
[38] "Old Burlington," *Burlington Free Press,* 7 June 1919.
[39] *Burlington Free Press,* 2 October 1828.
[40] *Burlington Free Press,* 2 October 1829.
[41] *Burlington Free Press,* 15 May 1829.
[42] *Burlington Free Press,* 19 June 1829.
[43] Rann, *History of Chittenden County,* 445.
[44] Burlington Land Records, 18 January 1831, vol. 10, 61–62 refers to Colchester Land Records, 13 January 1830; 28 January 1830, vol. 10, 61–62; 13 August 1830, vol. 10, 29; 30 August 1830, vol. 10, 21.
[45] Burlington Land Records, 8 January 1833 (received for record), vol. 10, 61–62.
[46] Clinton County Historical Association, *Reflections—The Story of Redford Glass* (Plattsburgh, 1979), 7–8; Burlington Land Records, 7 March 1831, vol. 10, 90–91.
[47] *Burlington Free Press,* 27 May 1831.
[48] *Burlington Free Press,* 26 August 1831.
[49] *Burlington Free Press,* 28 January 1892. Smith obituary.
[50] Frederick Smith, letter to Linsley and Chipman, 15 March 1832, Linsley Papers, Sheldon Museum, Middlebury, Vt.
[51] Ibid.
[52] Frederick Smith, letter to Linsley and Chipman, 3 April 1832. Linsley Papers, Sheldon Museum, Middlebury, Vt.
[53] Elijah Burroughs, letter to Linsley and Chipman, 3 April 1832, Linsley Papers, Sheldon Museum, Middlebury, Vt.; Champlain Glass Company Papers, Stock Certificate Number One. Special Collections, Bailey-Howe Library.
The next year Long moved on to the Lake Dunmore Glass Company where he stayed until his death in 1841 of a lung ailment, an occupational hazard of glass blowing. (Redwood Glass Company newspaper article reprinted from *Watertown Times,* 1963. Jefferson County Historical Society, Watertown, N.Y.)
[54] Clinton County Historical Association, *REFLECTIONS,* 7; *Burlington Free Press,* 26 April 1833.
[55] Frederick Smith, letter to Jemima Smith, 27 January 1834, Smith Papers at residence of Levi and Sybil Smith, Burlington, Vt.
[56] Frederick Smith, letter to Jemima Smith, 14 January 1835, Smith Papers at residence of Levi and Sybil Smith, Burlington, Vt.
[57] Frederick Smith, undated expense sheet, Smith Papers at residence of Levi and Sybil Smith, Burlington, Vt.
[58] Jemima Smith, letter to Frederick Smith from Clarkson, N.Y., 9 April 1835, Smith Papers at residence of Levi and Sybil Smith, Burlington, Vt.
[59] Rann, *History of Chittenden County,* 462.
[60] Hazen, *Panorama of Professions,* 245.
[61] McLaughlin, "Glassmaking," 10.
[62] Champlain Glass Company Papers, Pay List. No. 1. Loomis Smith & Co., Special Collections, Bailey-Howe Library; D. R. Guttery, *From Broad-Glass to Cut Crystal* (London: Leonard Hill, 1956), 37.
[63] Champlain Glass Company Papers, Pay List. No. 1.
[64] Guttery, *From Broad-Glass,* 23.
[65] Wilson, *New England Glass and Glassmaking,* 87; John Johnson, Johnson Papers.
[66] John Johnson, 1839 Map of Burlington, Special Collections, Bailey-Howe Library.

[67] John Peck and James Dean v. Champlain Glass Company, Vt. Chit. Sup. Ct. Box 8. 7 January 1836.
[68] Burlington Land Records, 24 February 1838, vol. 13, 441–443; 15 January 1839, vol. 14, 115–116.
[69] *Burlington Free Press,* 28 December 1838.
[70] Levi Smith Sr., interview by Lorraine Dwyer, Burlington, 1948, in file of Lilian Baker Carlisle.
[71] The U.S. Census of 1840, tabulated for Burlington appears in T. D. Seymour Bassett, *Urban Penetration of Rural Vermont, 1840–1880* (Ph.D. diss., Harvard University, 1952), 44.
[72] Burlington Land Records, 5 March 1839, vol. 14, 169–170; 24 November 1841, vol. 15, 357; 1 April 1840, vol. 14, 503–507; 17 April 1840, vol. 14, 535.
[73] Hemenway, *Gazetteer,* vol 1. 684, also 844.
[74] Champlain Glass Company Papers, Special Collections, Bailey-Howe Library.
[75] "Wholesale Prices Current of Burlington Window Glass," 1 August 1844, Special Collections, Bailey-Howe Library.
[76] Frederick Smith Papers, Special Collections, Bailey-Howe Library; Nathan Daboll, *Schoolmaster's Assistant* (Ithaca, NY, 1841), 85. One pound Canadian currency equaled four dollars Federal money according to Daboll's arithmetic book.
[77] Ralph N. Hill, *Lake Champlain: Key to Liberty* (Woodstock: The Countryman Press, 1976), 233.
[78] Peter Smith, "Burlington, Vermont 1791–1848. A Study of Economic Development and Social Change in a Community" (Ph.D. diss. Princeton University, 1968); Burlington Land Records, 22 December 1846, vol. 18, 319.
[79] Champlain Glass Company Papers, Special Collections, Bailey-Howe Library.
[80] *Burlington Free Press,* 23 June 1848; 2 June 1848; 1 April 1848.
[81] Champlain Glass Company Papers, Smith, Wilkins & Landon ledger, Special Collections, Bailey-Howe Library.
[82] Dorothea Smith Hanna, telephone interview by the author, 14 November 1993.
[83] Ralph N. Hill, *Lake Champlain,* 225. Jason Pierce's health deteriorated rapidly as he contemplated the decline of St. Johns and he died on September 6, 1851, the same day that the steamboat to Whitehall departed for the last time from St. Johns.
[84] 1850 U.S. Industrial Census, Microfilm, Bailey-Howe Library. *Walton's Vermont Register and Farmers' Almanac* (Montpelier: E. P. Walton & Sons, 1842–1851) lists Champlain Glass Company in its 1850 edition but the register was an annual commercial publication printed and for sale the previous year. The offices of the Vermont Secretary of State and the Burlington City Clerk have no records about the closing of the company.
[85] 1850 U.S. Population Census, Chittenden County, Vermont. Microfilm, Bailey-Howe Library. The Census showed that Fred Smith's household consisted of himself and his wife, four children age eight and under, his mother, Jemima Smith, and an eighteen-year-old Irish girl.
[86] Wilson, *New England Glass,* 91.
[87] Levi Smith Sr. interview by Lorraine Dwyer.
[88] Burlington Land Records, 12 May 1855, vol. 13, 443; Donald E. Cooke, *Marvels of American Industry* (Maplewood, N.J.: Hammond, 1962), 54.
[89] Burlington Land Records, 7 June 1856, vol. 25, 494–495.
[90] *Burlington Free Press,* 28 January 1892, Smith obituary; Dorothea Smith Hanna interview by author, 14 November 1993.
[91] Alan Gowins, letter to Corning Museum of Glass, 1955, Fleming Museum, Burlington, Vt.
[92] Hanna interview by author.