

## VERMONT HISTORIC PRESERVATION PLAN

### INDUSTRY AND COMMERCE THEME

#### Overview

The immediate concern of most of Vermont's early settlers was neither commerce nor industry but simply survival. The first task of any settler was to cut enough trees to build a crude log cabin, and to gradually clear enough land to raise sufficient crops to feed the family, and provide pasture for livestock.

Initially, practically all the settlers' needs were provided for on the homestead. Trees were used to build house, barn and fencing. Crops, such as corn and wheat, were planted around the stumps of felled trees, and the harvests were ground into coarse meal with a hand operated plumping mill. Every farm had a few sheep, a couple of cows and some pigs and chickens, and the livestock provided both food and necessary clothing.

While this near-subsistence way of life was fairly typical for early settlers, commercial transactions occurred almost immediately. Goods and services which could not be produced on the farm had to be procured through barter or purchase. Potash, made from wood ashes and therefore a plentiful by-product of land clearance, provided the earliest source of cash income for settlers.

Not all Vermont's early settlers were self-sufficient yeoman farmers. While some settlers came to Vermont in search of large tracts of cheap land on which to establish a family farm, others were attracted by the wealth of rivers, streams and falling water which could be harnessed to power local industry. Consequently, industrial buildings such as saw and grist mills were often among the earliest buildings constructed in communities located on any kind of water source. These mills frequently became the nucleus of local commerce, and many a town and village grew up around one of these early manufacturing sites.

Vermont's abundance of rivers and streams attracted other early industries as well. Paper-making, which required vast amounts of water to process and power, was one of these. The first paper mill was built in Bennington in 1784. By 1810 there were reportedly 10 paper mills in Vermont. With the establishment of large-scale paper mills during the latter half of the 19th century the earlier mills, unable to compete, eventually shut down and today exist only as archeological sites.

The discovery of iron ore deposits in Rutland and Addison counties during the 1780s, and the general demand for iron products during the settlement period prompted the early development of the iron industry in Vermont. By 1800 a number of ironworks had been established, mostly west of the Green Mountains. After the opening of the Champlain Canal in 1823 the character of Vermont ironworks changed from a large number of smaller works to fewer, large, industrial

scale works such as those in Brandon, Pittsford, East Dorset and Bennington, among others. After 1850 it became cheaper to bring iron in by rail than to manufacture it locally, and large-scale iron-making in Vermont came to an end. While the industrial buildings associated with the iron industry are no longer standing, the sites themselves have revealed substantial archeological remains.

Since iron manufacturing required vast amounts of fuel, the charcoal industry developed alongside that of iron. The extensive land clearance that was taking place in Vermont during the late 18th and early 19th centuries to make way for pastures and fields provided a plentiful supply of raw material for charcoal making. Early on, charcoal was processed on site in mound-type kilns, then transported by ox-cart to the nearest iron-works. After the Civil War, charcoal making was mostly associated with lumbering activity, and more permanent stone and brick kilns replaced the earlier mound-type kilns. Today, a number of these old kilns can still be found along streams on the western slopes of the Green Mountains.

During the first half of the 19th century, a number of factors contributed to the expansion of industry and commerce throughout Vermont. The Jefferson Embargo of 1807, which put a halt to all foreign imports, gave tremendous impetus to the development of local industry. The opening of the Bellows Falls Canal in 1802, and the Champlain Canal in 1823 greatly improved the shipment of goods in and out of state. Towns located at important shipping points developed into bustling, prosperous communities whose docks were busy with boat building, the loading and unloading of cargo, and other industrial and commercial activities.

Because of these factors, and the prosperity enjoyed by many towns as a result, the demand for finished products increased and goods formerly made in the home were gradually removed to a factory or mill setting. Tanneries, for example, were established in most towns to process the hides of slaughtered livestock into leather. Distilleries were set up to convert surpluses of rye, corn and apples into cider brandy. Oil mills ground linseed for paints and brushes. And craftsmen such as metalsmiths, blacksmiths, pewterers, tailors, hatters, saddlers, house joiners and others began to emigrate to Vermont in increasing numbers.

Cloth manufacture, an article almost exclusively made at home, first began to move out of farm homes around 1800 with the erection of fulling and carding mills which sized and carded wool for home manufacture. The opening of the Champlain Canal and the 1824 Tariff on Woolens gave considerable stimulus to woolen manufacturing in Vermont, and woolen factories were established wherever sufficient waterpower existed. Starch factories, which processed potato starch for textile mills, also began to appear in many towns around the state at this time.

Along with the demand for more finished goods was a need for more permanent homes and community buildings. Plentiful supplies of logs were fed into many a busy sawmill to be converted into clapboards,

window sash, window blinds, and other finished lumber. Brickyards were established in areas with sufficient clay and lime, and kilns were constructed for firing the clay. Lime was not only used for mortar, but it was also used as a flux in iron-making, as a key ingredient in plaster, and as an early fertilizer. Lime kilns were built in a variety of sites, ranging from farmsteads to industrial ironworks. At least 44 lime kiln sites have been recorded west of the Green Mountains in recent years, primarily in central and southern parts of the state.

Deposits of granite, marble and slate were discovered early on, and as early as 1805 stone quarried in Rutland and Pittsford was being floated up to Middlebury to be sawn at Eben Judd's marble mill, the first marble mill ever established in the United States.

Glass manufacturing first began in Vermont in 1813 on Lake Dunmore in Salisbury when the Vermont Glass Factory began making glassware and window glazing. Other short-lived glass factories were established during the 1820s and '30s in Manchester, Vergennes, Burlington and Pittsford.

Up until the middle of the 19th century, the operators of these various manufactories were invariably farmers as well. Every farmer plied some trade to supplement his income. It not only kept him busy during the long months of winter, but it also provided him with a commodity to barter with for other goods.

Farmers bartered their home-made goods locally, often at the local tavern, grist mill, or in the church yard on Sundays. As transportation networks improved, however, commercial transactions increasingly took place in the villages. Crossroads, mill sites, and postal drop-off points were the most desirable sites for commerce, and villages located at such sites often evolved into busy commercial centers.

With the development of village commerce, special stores, rather than taverns or mills, became the focus of commercial activity. In more sizable towns some of Vermont's first commercial blocks began to appear around the 1830s. For Vermonters who lived too far away to consistently benefit from village commerce, itinerant peddlers became an important part of rural life.

In spite of the commercial prosperity enjoyed by a number of towns during the early 19th century, Vermont continued to be an agriculture-based economy and the majority of its commercial and industrial enterprises were relatively small-scale and oriented towards an almost exclusively local market. While the canals had improved commerce significantly, overland transport was both limited and expensive.

Around 1850, however, two revolutionary developments occurred which changed the face of industry and commerce forever. One of these developments had its beginnings in Windsor, Vermont. In the brick building that now houses the American Precision Museum, the system of

manufacturing articles with interchangeable parts was first used in the production of rifles and machine tools. This "precision" method of manufacturing was a revolutionary breakthrough for industry and marks the beginning of modern manufacturing and mass-production. It also signalled the advent of the machine tool industry which would later bring international reknown to Springfield, Vermont.

The second revolutionary development was the coming of the railroad. The Iron Horse not only made the transport of heavy goods easier and less expensive, but it opened up new markets for Vermont goods and supplied Vermonters with a greater variety of factory goods than ever before.

The railroad also created entirely new commercial networks, thereby shifting the centers of commerce away from many of the traditional routes such as the waterways and old stage routes. Consequently, many towns that had relied on those routes for their livelihood fell into decline. Meanwhile, villages lucky enough to be bisected by steel rails enjoyed unprecedented growth and prosperity during the latter half of the 19th century. As the scale and number of institutions of commerce expanded, railroad village centers took on an increasingly urban appearance. Fires occurred with alarming frequency in downtown areas, and after the old free-standing stores burned they were replaced by rows of multi-story wood-frame, brick and stone commercial blocks with stores on the first floors and professional offices on the upper floors.

As commerce expanded, many new businesses became viable such as real estate, insurance, and banking, and commercial gas lighting utilities were organized to serve these areas and the nearby homes of the wealthy.

The effect the railroad had on industry was no less significant and it changed forever the manufacturing character of the state. As mass-produced goods brought in by rail began to compete with those made locally, small-scale industry such as boot and shoe manufactories were soon forced to close their doors.

In some cases, these declining local industries were replaced by the development of fewer, large-scale industries. This was especially true of the textile industry in Vermont which, after 1850, continued to consolidate into fewer and fewer concerns until by the late 19th century textile manufacture was almost exclusively carried out in the so-called "giant" mills such as the Winooski Mill, and the Holden-Leonard mill in Bennington. Since the turn of the century, textile production in Vermont has steadily declined, and the old mill buildings have either been demolished, or adapted for new commercial and industrial uses.

Other industries, such as mining, stone and lumber, flourished with the arrival of the railroad since it made overland shipment of heavy materials much less costly.

Copper was one of the first large-scale mining industries in Vermont

to benefit from the railroad. Mining companies were established in Vershire, South Strafford, Corinth and Richford, and skilled Cornish copper miners from England made up the bulk of the workforce. The mines consisted of enormous operations including blast furnaces, smelting houses, warehouses, blacksmith shops, coal and lumber houses, and much more. 1880 marked the peak year of Vermont copper production when it produced the second largest amount of copper in the country. While most of the buildings and structures formerly associated with Vermont's copper boom are no longer standing, the old Ely Mine in Vershire is a virtual ghost town where one can still find substantial remains including flues, mining shafts, refuse piles, and former roasting beds.

The immigration of skilled Welsh slate quarriers from Wales and Pennsylvania and the introduction of the railroad to the western portion of Rutland County in 1849 prompted the rapid growth of the slate industry between 1850 and 1870. The Vermont slate belt centered largely in the towns of Wells, Poultney and Fair Haven. Whole settlements, such as West Castleton, sprouted up near the quarries, mills and slate yards. Most of the industrial structures, and homes of the Welsh slate workers are no longer standing. Instead, it is the result of their labors, the colorful slate roofs and marbelized slate mantels that survive as legacies of this significant part of Vermont's industrial heritage.

Marble had been quarried as early as the 18th century in towns such as Dorset, Pittsford, Middlebury and West Rutland. Up until the latter half of the 19th century the stone was used primarily for headstones, hearths, firejams and lintels. The railroad allowed for the transport of much larger blocks of stone, and Vermont marble was soon distributed throughout the United States for the construction of public and private buildings and memorials. During the late 1800s, Proctor and West Rutland became the centers of marble production in Vermont, with Irish, French-Canadians, Swedes and Italians dominating the workforce.

Between 1890 and 1915 both the Vermont marble and slate industries reached their peak, producing respectively the first and second highest valued stone product in their industries in the United States. While the slate industry died out around World War II, Vermont marble is still a highly valued stone, and Proctor continues to be the center of Vermont marble production.

Though granite was quarried as early as the 1790s, it was not until the railroad came to towns like Barre, Hardwick, Ryegate and Bethel that the granite industry developed to any significant degree. With the help of Scottish quarrymen and skilled Italian stone carvers, Barre quickly developed into the chief granite producing center in the world. While Barre granite has been used in the construction of such grand public buildings as the Vermont State House and the U.S. Capitol, historically, most Barre granite has been used for memorials. According to the Barre Granite Association, the stone industry is hoping to expand its involvement in the building industry in the future.

Housing for immigrant workers employed in the stone industry varied from company to company. Initially workers stayed in boarding houses, the homes of fellow workers, or crude shanties located near the quarries and mills. Eventually some companies built worker housing, while others provided financing and materials for workers to build their own homes.

Lumbering and wood products were another important component of late 19th century industry, changing in both organization and scale from earlier periods. In the 1850s, a Mr. Lane of Plainfield, Vermont invented the first portable sawmill. In 1863 he moved his company to Montpelier and began manufacturing his sawmills on a mass-scale for world-wide export at the former Lane Shops.

The invention of the portable sawmill, together with the railroad, and the use of steam power instead of water, made remote stands of virgin timber more accessible and sawmilling developed into a large-scale industry for the first time in Vermont. Since the railroad also facilitated the long distance shipment of logs, Burlington began processing Canadian logs on its waterfront and by 1870 the Queen City ranked as the third largest sawmilling center in the country. During the last quarter of the 19th century logging and sawmilling activity pushed further and further into the Vermont mountains, resulting in the growth of small mill villages complete with post office, school, church and homes. Few of these once bustling sawmilling centers survived, however, and places like Old Job in Mt. Tabor, and South Glastenbury, have disappeared with hardly a trace.

While much of the logging going on during the late 19th century was for sawmilling purposes, large tracts of forest were also being logged for pulp wood, used in the manufacture of paper. In 1870, William Russell of Bellows Falls became one of the first people to use wood pulp instead of rags in the manufacture of paper, and Bellows Falls soon developed into one of the largest paper-making centers in the country.

While the iron-making industry had largely died out with the coming of the railroad, iron-working flourished in towns such as Bellows Falls, St. Johnsbury and Brandon, among others. The manufacture of platform scales was perhaps the most notable iron-working industry of 19th century Vermont. Invented by Thaddeus Fairbanks of St. Johnsbury, the platform scale was being marketed world-wide by the late 1840s. The Howe Scale company in Brandon, and later Rutland, ranked second in the state in the production of platform scales; today its buildings are being used for incubator space for new businesses. Scales are still being manufactured in St. Johnsbury, although hardly anything is left of the original scaleworks since most of it was destroyed by fire in 1972.

By 1900, industry had come a long way from the mill-on-the-stream days. Steam and electric power had replaced water power by this time, rendering a once valuable resource no longer directly useful to

industry. Nonetheless, new ways of harnessing power from Vermont's waterways had been discovered, and by the turn of the century, hydro stations were converting waterpower into electricity. Some of the early power stations were located in old mill buildings, but as demand increased, special hydro stations and dams were constructed. The 1927 flood destroyed a number of early hydro plants, many of which were replaced by larger stations still in use today.

Among the first places to benefit from electricity during the 1880s and '90s were the commercial downtowns of some of Vermont's larger towns. Electricity not only allowed business hours to extend further into the evening, but it also powered a new form of urban transportation, namely, the electric streetcar. The streetcar era marked the heyday of Main Street commerce. In towns like St. Johnsbury, St. Albans, Burlington, and Rutland, people living in outlying towns had easy access to Main Street, thereby multiplying the number of shoppers descending upon downtown shopping districts each day. Many commercial buildings constructed during the late 19th and early 20th centuries reflect the prosperity and optimism of the time in their generally larger size, quality of materials, and attention to detail. The Service Building in Rutland, built in 1929, is the most impressive commercial structure built during this period. It is Vermont's first skyscraper, and features an Otis Elevator, named after Elisha Graves Otis. Otis was a native of Halifax, Vermont and is credited with being the inventor of the first successful elevator.

No sooner had the electric railway hit the streets of Vermont's big towns than the automobile made its debut. By the 1920s motoring was fast becoming a popular past time for a growing number of Vermonters, and the highways soon replaced the railways as the dominant commercial arteries. Since most downtown areas were ill-equipped to deal with this new form of transportation, a growing number of business and commercial establishments began to re-locate along roads passing through the outskirts of towns.

Vermont's tourist and recreation industries greatly benefitted from the automobile, and tourist cabins, boarding houses, and restaurants began to dot many a well-travelled route.

Since World War II many of the industries traditionally associated with Vermont have declined, and been replaced with such major employers as IBM, General Electric and Digital. As the traditional industries have declined, many of the buildings and sites associated with those industries have either been abandoned or torn down. During the 'sixties and 'seventies the construction of large shopping malls began to compete with, and in some cases drain commercial activity from some of Vermont's larger downtown areas. As business fell in these areas, whole commercial blocks were abandoned. Fortunately, during the late 1970s, citizens concerned about the vitality of their downtowns and the competition from growing strip development, turned to historic preservation as an effective tool to keep economic activity in the heart of the community. The renewed interest in saving downtowns and village centers has revived many

commercial buildings through facade restorations, the removal of artificial siding material and other preservation techniques.

While the demolition of individual commercial buildings in downtown areas has slowed significantly, industrial buildings continue to be some of the most threatened resources in the state. Among the problems associated with their renovation are the fact that many people simply don't know what to do with these often enormous structures. Finding financing can often be tricky. And building codes, fire codes, and the removal of hazardous materials such as asbestos have also been a deterrent to rehabilitation.

At the same time, however, there have also been a number of people who have realized both the value of these buildings and sites, and their economic potential. As a result, industrial structures, and whole complexes of structures, have gained new life throughout the state as commercial buildings, theatres, museums, recreational sites, residential complexes, offices, incubator space and more.

But the benefits of preserving Vermont's historic commercial and industrial sites and structures are not only economic. They also constitute a large, and largely unknown, part of our identity as a state. They remind us that there is more to Vermont, and Vermont's history, than farms and forests. That the story of many a Vermont town began with the construction of a mill or small factory. That it was not just the products of the soil, but what lay beneath the surface of that soil, the copper, slate, granite and marble, that made Vermont what it is today. The challenge we now face is how to find a way for those buildings and sites which represent this rich and multi-layered heritage to continue to be a useful and viable part of our communities, and the state as a whole.



### Historic Context Summaries

#### **Public and Private Utilities: (1850-1940)**

Prior to 1850, most Vermonters relied on their own private systems of water, power and lighting, although in some towns public aqueducts were created as early as the late 18th century. By the Civil War, public water systems had become fairly common in many of Vermont's larger towns. Gas lighting became popular around the 1850s, though it was mostly confined to urban or semi-urban areas. In 1848 the first telegraph system in Vermont was put in place, transmitting information from Boston to Burlington. Telegraph stations were often located in railroad depots since the telegraph lines typically followed the rail lines. The telephone made its debut in the Green Mountain State in the late 1870s. Electricity first came into use in Vermont during the 1880s with most towns receiving their electricity from coal-fired, gas or water-powered generators. The first hydro-electric plant was built in 1886 on the Winooski River, generating power for the city of Burlington. Over the course of the next few decades, hydro-plants were constructed throughout the state to serve the growing number of patrons. The flood of 1927 destroyed a number of early hydrostations, whereupon fewer, larger stations were constructed, reflecting the trend towards consolidation in the hydro-power industry. In 1935 the Rural Electrification Act was passed, which brought electricity into many rural homes in Vermont for the first time.

#### **Quarrying (1790-1940)**

Vermont's wealth of granite, slate and marble was discovered early on and small quarries were set up in scattered locations around the state during the late 18th and early 19th centuries. Prior to 1850, stone was quarried with hand tools, and transported short distances by huge teams of oxen. The stone was used mostly for building materials, hearths and gravestones. After 1850, the coming of the railroad, together with technological advances in quarrying, allowed the stone industries to develop on a large commercial scale. Marble, slate and granite were the principal stones quarried in Vermont, with whetstone, limestone, soapstone, sandstone and talc produced in lesser quantities. Slate has not been manufactured on a large scale in Vermont since World War II, but marble and granite are still significant industries.

#### **Small Craft and Cottage Industries (1790-1940)**

Small craft and cottage industries were an essential component of most Vermont towns and villages prior to 1850. Since distances between settlements were great and transportation routes generally poor each settlement needed to be largely self-sufficient. Early craft and cottage artisans included blacksmiths tanners, tailors,

hatters, cobblers, coopers, box makers, furniture makers and more. These small-scale industries were often located in an ell in the artisan's home, or in a nearby barn or shop. Industries requiring water power were necessarily located on a river or stream. With the development of mass production technologies, and improved means of transportation these these small, localized industries were gradually replaced by larger industries and new technologies.

#### **Small Water-Powered Mill Production (1790-1930)**

Water power was essential in providing for the needs of the early settlers. Vermont's abundance of rivers and streams provided an ample supply of mill sites and many of Vermont's early settlements developed around these sites. Indeed, some land charters required the establishment of sawmills. Throughout most of the 19th century virtually every settlement had at least one mill and often more. The earliest water-powered mills were saw and grist mills. Other early mills include tanneries, trip hammer shops, forges, paper mills, fulling and carding mills, marble mills, and linseed oil mills. The gradual development of an export/cash economy led to the establishment of starch factories, woodworking shops, woolen and cotton mills, tool shops, iron mills, among others. By the late 1800s small water-powered mills were gradually replaced by larger mills powered by steam, and later electricity. Others were washed away in floods and freshets. As a result, early water-powered mills are very rare in Vermont.

#### **Textile Industry (1780-1940)**

Cloth manufacture, an article almost exclusively made at home, began to move out of Vermont farm homes around 1800. Fulling and carding mills, where wool was sized and carded for home manufacture, were built on many a fast-flowing stream or river after 1800. Cotton mills did well in the years of the War of 1812, but decreased when prices fell in peacetime. Occasionally the two processes occurred under the same roof, or in buildings shared by other small industries. Linen manufacture was limited in Vermont, with some early production in Scotch-Irish areas in the northeastern part of the state (i.e. Ryegate). The opening of the Champlain Canal and the 1824 Tariff on Woolens (a tax on woolens imported from England) prompted the rapid growth of the woolen industry in Vermont, and woolen factories were established throughout the state wherever sufficient waterpower existed, and especially in places near the wool source (i.e. sheep farms). Starch factories, which processed potato starch for textile mills, also began to appear in many towns around the state at this time. Large-scale textile manufacturing increased in the 1830s when sheep raising in Vermont was at its height. Around the mid-1800s the number of textile concerns in Vermont began to drop as the industry consolidated into fewer, larger firms. The Civil War prompted a greater demand for wool during the 1860s. Finally, the late 19th century was marked by the emergence of the so-called "giant" firms in towns such as

Bennington, Winooski, Rutland, Johnson, Fair Haven, and Bridgewater, among others. While Vermont enjoyed a position of prominence in the manufacture of woolen and knit goods during the 1880s, the state's woolen industry experienced a steady decline during the first half of the 20th century.

**Commercial Development in Rural Areas: (1790-1940)**

Communities of traders and Native Americans located around early military forts were the initial centers of commerce in Vermont. After permanent settlement began around 1760, commercial transactions took place in private homes, taverns, churchyards, mills, and eventually stores. Early on, stores often consisted of a room or ell in the storekeeper's home. As Vermont's economy began to strengthen after the Revolution, special store buildings became more common, often serving a variety of local functions, including post office, bank, stagecoach stop, town clerk's office, and more. Rural villages also had craft and cottage artisans such as cobblers, blacksmiths, coopers, and harness makers, among others. Itinerant peddlers travelled from town to town, bringing merchandise to isolated rural homes. After 1850 the railroad brought the travelling salesmen and manufactured goods from more distant sources. The development of pre-packaged, mass-produced goods, mail order goods, and chain stores during the late 19th and early 20th centuries lessened the demand for locally produced goods, forcing many local merchants and artisans out of business. The automobile furthered this trend as it allowed customers to travel to urban shopping centers. By World War II, these combined factors depressed local commerce; however, the rise of tourism during the 20th century has brought new business to many general stores around the state.

**Commercial Development in Urban Areas: (1790-1940)**

Urban development tended to occur at key transportation and industrial points. Early on these key points were located along the waterways, or at important crossroads. County seats were also a focal point for commercial development since they were centrally located and were places where people from surrounding areas tended to conduct their court and governmental business. Unlike rural villages, where most commercial transactions took place in one or two stores, larger commercial centers encouraged a variety of specialty shops such as hatters, tailors, dry goods, apothecary shops, etc. In 1806 the Legislature set up Vermont's first state banks in Middlebury and Woodstock. After 1850 the railroad brought with it a wider variety of merchandise, and downtown shopping districts developed. As fewer and fewer goods were made locally, the traditional system of barter was replaced with a cash economy, and banks multiplied in response, locating themselves in the heart of downtown. The railroad also shifted commercial centers away from the waterways, and towns lucky enough to be bisected by steel rails prospered, while many waterfront towns went into decline. The advent of the electric trolley in the 1890s brought throngs of

shoppers into downtowns each day. Imposing, multi-story commercial blocks, both wood-frame and brick, replaced the free-standing shops of earlier times. With the arrival of the automobile during the early 1900s, commercial arteries shifted once again from the railways to the highways, and commercial establishments began to develop in strips along well-travelled roads on the outskirts of large towns.

#### **Logging and Lumber Production: (1760-1940)**

Wood was Vermont's earliest commercial and industrial resource. Vermont was a forested wilderness when the first permanent settlers came in the 1760s. The extensive land clearance that occurred over the course of the next half century not only supplied the early settlers with an ample source of lumber for building, but it also provided them with their first cash crop, potash. Charcoal was another early by-product of Vermont's forests, and was used to fuel the various iron furnaces scattered about the western half of the state in the early 1800s. Next to grist mills, sawmills were one of the earliest buildings constructed in a community. Early sawmills served local needs almost exclusively, though some lumber was sold for export. With the opening of the Bellows Falls and Champlain Canals during the first quarter of the 19th century, the commercial export of lumber became more widespread. The coming of the railroad around 1850 gave the greatest boost yet to the logging and lumber industries as it allowed for easier, cheaper, and faster transport of logs and lumber, and also permitted loggers to push further into the mountains for their raw material. Log drives became an increasingly common sight on the Connecticut River. Lumber companies often built their own railroads and company towns, many of which have disappeared with hardly a trace. In the 20th century, the use of logging trucks did away with the need for portable sawmills. Today logging is still the principal industry in Essex County.

#### **Mining - (1800-1940)**

Copper was mined in the late 18th century, but it was not until the mid-1800s that sub-surface mining got underway to any significant extent. Vershire, Strafford and Corinth were the leading copper mining regions in the state. The Elizabeth Mine in Strafford was used periodically up through the early 1950s. In 1880, Vermont ranked as the second largest copper producer in the United States. Gold was discovered in Bridgewater and Plymouth during the 1850s, and a brief gold rush ensued. Various gold mining companies were established; they erected small mills, boarding houses, dams, etc. Silver and lead were mined to a degree. Iron was the predominant material mined in Vermont. (see Iron Industry)

### **Manufacturing of Water Transport - (1800-1900)**

In the days before the railroad, the waterways served as the chief commerce routes for Vermont goods. Throughout the first half of the 19th century, boat-building occurred at numerous points along the shores of Lake Champlain, the Connecticut River, and even Lake Memphremagog. Lake Champlain boatyards were significantly larger than those along the Connecticut since lake commerce supported larger commercial vessels. The War of 1812 created a need for ships to fight battles on Lake Champlain, and McDonough's shipyard was established to meet that need. The opening of the Champlain Canal in 1823 gave considerable stimulus to boat building, and Vergennes, Charlotte, Burlington and St. Albans Bay boasted some of the busiest boatyards along the lake. Connecticut River boatyards mostly built flat-bottomed boats, the typical cargo boat used on the river. After the coming of the railroad, as lake and river commerce diminished, boatyards were gradually abandoned.

### **The Manufacture of Land Transport - (1790-1940)**

Since the transport of both people and goods was crucial to the economic development of Vermont, the manufacture of land transport accompanied early settlement. The establishment of saw mills, iron furnaces, foundries, etc. facilitated such manufacturing. Wagon, sleigh and/or carriage shops were located in most towns. With the introduction of the railroad, associated manufactories were established to produce railroad ties, rails, cars, etc. As small railroad companies developed lines, each had its own machine shop and round house at some location. Major rail lines had shops located at important railway centers such as Northfield, St. Albans, Rutland. With the advent of the automobile, a few experimental automobiles were built in Vermont, but the industry never fully developed.

### **Building Materials**

There were many raw materials available in Vermont early on for building. Sawmills were among the earliest mills established in towns following settlement; indeed, they sometimes preceded, and became the nucleus of, early settlement. Bricks were typically made on site, often from the very clay where the foundation pit was excavated, and limestone was ground into powder to make mortar. Improved methods of transportation, and a growing demand for granite and marble and slate for building materials and monuments stimulated a boom in stone quarrying and manufacture in Vermont in the late 19th and early 20th centuries. Glass production developed on a factory scale in 1813 when the glass factory in Vermont opened in Salisbury. Other short-lived factories were established during the 1820s and '30s in Manchester, Vergennes, Burlington and Pittsford. Shingle mills, clapboard mills, sash, blind and door factories were very common during the second half of the 19th century, both in urban centers and at scattered rural locations. (see Historic

Architecture and Patterns of Town Development Theme Historic  
Summaries under "Building Materials")

### **Paper Making**

Paper making was an early industry in Vermont. The first paper mill was built in Bennington in 1784 on the falls of the Walloomsac River in a place formerly known as "Paper Mill Village". The second paper mill was built in Fair Haven by Matthew Lyon. It was at this mill that the method of making paper from a combination of bark and rags was believed to be developed for the first time, although rags remained the dominant raw material for paper until the mid 1800s. By 1809 there were reportedly seven paper mills in the state: Bennington (1784), Castleton (1794), Middlebury Falls (1800), Bellows Falls (1802), Sharon (1801) and Montpelier (1806). Until around 1850 rags were the dominant raw material for paper. Paper mills were relatively common by the mid-1800s ranging from one-room operations, to entire buildings, with the vats and rollers on the first floor, and possibly a bindery on the second. Printing shops were often located nearby. In 1869, a mill in Bellows Falls became one of the earliest paper mills to use wood pulp and it later became a leader in the manufacture of paper.

### **Iron Industry (1785-1890)**

Vermont's iron-making industry developed in association with other pioneer works such as grist and saw mills, blacksmith shops, etc. in response to the needs of early settlers. Pre-1800 ironworks were distributed near developing population areas that created the demand for raw iron. As transportation networks improved somewhat, industrial demand grew (1800-1850) and iron works began to locate closer to necessary fuel (charcoal- see context brief on Vermont's charcoal-making industry), ore, and more reliable water power. Better than 90% of the ironworks operated to the west of the Green Mountain range, concentrated in Addison and Rutland Counties. After 1823, the opening of the Champlain Canal changed the character of Vermont iron works from a larger number of small speculative operations in pre-canal days to costly high-production works after the canal. The railroad eventually brought in better iron made cheaper than local works could produce and ended iron-making in Vermont. Iron-working, in the form of machine shops and foundries expanded to reach peak production about 1880-1890, dwindling in numbers and production thereafter. Ultimately, Vermont ironworks were limited by the quantity and quality of its ore, the length of the winters, which froze streams that powered the works, and the ironworks' remoteness from major industrial centers and seaports nearer to the ocean.

**Machine Tool Industry**

(Robbins and Lawrence in Windsor at forefront of industry -- interchangeable parts, mass production. Springfield industries - Jones and Lamson, Fellows Gear Shaper, Parks and Woolson, etc.)

To Be Written.

**Manufacturing of Agricultural Implements**

To Be Written.

**Science and Invention**

To Be Written.

**Other Industries**

To Be Written.

Property Types

(Known and/or Expected To Be Found)

Adit (mine tunnel)  
Bank  
Blacksmith Shop  
Brick Yard  
Brick Kiln  
Bulk Tank  
Canal  
Charcoal Kiln (mound, stone, brick)  
Cemetery  
Circular Gutter  
Colliers' Hut  
Commercial Block  
Company Store  
Company Town  
Corporate Architecture  
Dam  
Dump  
Factory  
Factory Owner's House  
Farm Stand  
Finishing Shed/Shop  
Flue  
Flume  
Forge hearth  
Foundry  
Furnace  
Gasholder  
Glass Works  
Home of Craftsman  
Home of Inventor  
Horse Hovel (logging)  
Iron Mine  
Lime Kiln  
Loading Platform  
Log Boom, Cribbing  
Logging Camp  
Logging Railroad bed  
Logging Road  
Lumberyard  
Market  
Mill  
Mill Pond  
Mill Owner's House  
Ore crusher, washer and roaster  
Ore rooms/shed  
Penstock  
Portable Sawmill  
Power Houses  
Puddling furnace  
Pump House



Quarries  
Railroad  
Railroad Spur  
Reservoir  
Sanitorium  
Shaft Shop (work/craft shop)  
Slag Heap  
Slate Roof  
Stone-built Blast Furnace  
Stone curb and sidewalk  
Stone milling facility  
Storage Shed  
Store  
Structure  
Train Depot  
Trip Hammer and Anvil  
Turbine pit  
Underwater Wreck  
Village Support (blacksmiths, carpenter shops, schools, company stores and offices, iron master's houses, etc.)  
Water Wheel  
Water System (dams, sluices, mill ponds, etc.)  
Woodworking Mill/Shop (i.e. sash & blind; clapboard; etc.)  
Worker Housing  
Archeological remains of the above

(Property types for Machine Tool Industry, Manufacture of Agricultural Implements, Science and Invention, and Other Industries to be added when Historic Context Summaries are written)

#### Research Gaps and Questions

More information is needed about specific uses and applications of raw iron before c.1850.

Need to locate published references to ironworks at places otherwise not supported by local histories or field inspections.

Need data on pre-1850 ore processing data (washing, roasting, etc.)

What vegetation predominates in charcoal-laden soil?

Where was hardware made for reinforcement and use in kilns (hoops, doors, iron vents, etc.)?

What was final (pre-collapsed) configuration of stone-built kilns?

What generation forest generally stands today?

Do any virgin forests remain from the prehistoric period?

What were the roles, origins and relocations of immigrant miners and managers?

Major identification and evaluation of Orange County sites, esp. Ely, is needed.

Need more information on the technological changes/innovations in mining over time (mining specific but also water systems, community systems, etc.)

Need more information on mine site locations and all associated sites/features

Social histories of mining settlements

Impacts on local/regional/national markets

Need to identify all rivers that have log drives

What is the definition of "urban" for Vermont?

#### Relevant Constituencies

Vermont State Parks; private property owners; U.S. Forest Service; local (town, county and state) archeological and historical societies; Society for Industrial Archeology (SIA); industrial labor history societies; hiking and camping associations; public education television; current mining companies; William Gove (Logging and Lumber Industry); current logging companies; current paper companies; Society for the Preservation of Old Mills; industrial archeologists; Precision Museum; folklorists; store owners; chambers of commerce; local business associations; Rotary Clubs; local governments; local planning commissions; regional planning commissions; boating/yacht clubs; boat yards; marinas; marine archeologists; divers; Preservation Institute for the Building Crafts; AIA; vocational schools; builders and crafts unions and associations; museums; architectural historians; Fairbanks Museum; Science Teachers of Vermont;

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**POOR QUALITY**  
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July 18, 1991

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MADE IN VERMONT, SOLD IN VERMONT: OUR INDUSTRIAL AND COMMERCIAL HERITAGE

1) (1)(2)(3) The buildings and sites you are about to see are those which represent Vermont's industrial and commercial history. When most of us think of Vermont, the words "industrial" or "commercial" do not immediately come to mind. (4) Instead, the popular image is that of a rural, agricultural state. During the course of the past hundred years and more this pastoral image has been promoted by popular magazines, guidebooks, pamphlets, and commercial advertisements. (5) This public image is further reinforced by the fact that, throughout much of Vermont, silos rather than smokestacks grace what is still a predominantly rural landscape. }

(6) Yet because of this image we tend to overlook the fact that Vermont has been a national leader in the iron, copper, slate, marble, granite and machine tool industries. (7) Or that at one time virtually every town in Vermont had at least one mill or manufactory, and often more. (8) And while we tend to think of Vermont's first settlers as farmers, the fact is that many pioneers came north to tap into the industrial potential of Vermont's abundant network of rivers and streams. }

(9) So where are all the historic sites and structures which represent this important part of Vermont's past? If Vermont's industrial and commercial history is so important why isn't the physical aspect of that heritage more evident?

(10) Our commercial heritage is, in fact, very much in evidence. |

(11) Although we have lost many commercial buildings to fires, floods, demolition, and shifting commercial networks over the course of the past 200 years, (12) Vermont still has an incredible wealth of such structures, ranging from rural general stores, (13) to large downtown commercial blocks.

(14) While our industrial past is still visible in some of Vermont's larger towns such as Springfield, Burlington, Bellows Falls and others, (15) elsewhere in the state the evidence is much less obvious. With the gradual decline of local industry towards the end of the 19th century, many old mill and factory buildings were torn down or abandoned. (16) Still others have been lost to fire. }

(17) Yet despite these losses, a surprising number of resources have survived. Representing nearly 200 years of Vermont's commercial and industrial history, these resources include factories, mills, warehouses, (18) hydro stations, brickyards, (19) dams, lime kilns, (20) stores, taverns and banks. (21) They range in size and complexity from early grist and sawmills perched on the edge of a river or stream, (22) to giant factory complexes and associated worker housing. }

(23) There are many others that are less easy to see or identify. A walk through a forest or overgrown field may lead to an abandoned quarry, or the site of an old logging camp. }

(24) Or it might lead to a crumbling stone tower which long ago served as a blast furnace for Vermont's once thriving iron industry.

(25) And a trip down any river or large stream in this state is sure to reveal a few mill foundations and old dams dating back to a time when villages large and small buzzed with local industry.

(26) Clearly, there are many more historic industrial and commercial sites in Vermont than most of us realize. But simply knowing they are out there does not explain their value as historic resources. In order to understand their value to the present and future, we need to first locate their place and significance in history.

(pause)

2) (27) The immediate concern of most of Vermont's early settlers was neither commerce nor industry, but simply survival. The first task of any settler was to cut enough trees to build a crude log cabin, to clear land to raise sufficient crops to feed the family, and provide pasture for the livestock.

(28) Initially, most of the settlers' needs were provided for on the homestead. Trees were used to build house, barn and fencing. Crops, such as corn and wheat, were planted around the stumps of felled trees. And the livestock provided both food and necessary clothing.

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(29) Goods and services which could not be produced on the farm had to be <sup>obtained</sup> procured through barter or purchase. Potash, made from wood ashes and therefore a plentiful by-product of land clearance, provided the earliest source of cash income for settlers. }

(30) Although many of Vermont's early settlers came in search of large tracts of cheap land for farming, others were attracted by the wealth of rivers, streams and falling water which could be harnessed to power local industry. (31) In fact, industrial buildings, such as saw and grist mills, were often among the earliest buildings constructed in communities located on any kind of water source. These early mills were crude timber-framed structures housing a waterwheel and milling machinery, and were located the banks of fast-flowing streams or rivers. }

(32) If a waterfall was not readily available, dams and mill ponds were built to provide enough head to turn the waterwheel. (33) Saw and grist mills frequently became the nucleus of local commerce, and many a town and village grew up around one of these early manufacturing sites. }

(34) Vermont's abundance of rivers and streams attracted other early industries as well. Paper-making was one of these. The first paper mill was built in Bennington in 1784 on the falls of the Walloomsac River. By 1810 there were reportedly 10 paper mills in Vermont. |

(35) With the establishment of large-scale paper mills, such as this one in Bradford, during the second half of the 19th century, the older, smaller mills were forced to shut down and today exist only as archeological sites. ⚡

(36) The discovery of iron ore deposits in Rutland and Addison Counties in the 1780s, together with the general demand for iron products during the settlement period prompted the early development of the iron industry in Vermont. By 1800, a number of ironworks had been established, mostly west of the Green Mountains. ⚡

(37) After the opening of the Champlain Canal in 1823 the character of Vermont ironworks changed from a large number of smaller works to fewer, large-scale works such as those in Brandon, Pittsford, East Dorset and Bennington. ⚡ (38) After 1850, the railroad made it cheaper to bring iron in by rail than to manufacture it locally, and large-scale iron-making in Vermont came to an end. |

(39) With the exception of a few former iron masters' houses, none of the buildings associated with the iron industry are still standing. (40) However, the sites themselves have revealed many archeological remains, and the few furnace stacks (41) ⚡ or collapsed mounds of former stacks that have survived stand as giant reminders of a once sizable industry. ⚡

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3) 4) (42) Because iron manufacturing required large amounts of fuel, the charcoal industry developed alongside that of iron. The extensive land clearance that was taking place in Vermont during the late 18th and early 19th centuries provided a plentiful supply of raw material for charcoal making. (43) Early on, charcoal was processed on site in mound-type kilns, then transported by ox-cart to the nearest ironworks. Colliers spent from spring to late autumn living alone in Vermont's forests, tending the tricky fires at night, and catching what sleep they could in crude huts. (44) After the Civil War, charcoal making was mostly associated with lumbering activity, and more permanent stone and brick kilns replaced the earlier mound type kilns. (45) Today, the remains of a number of these old kilns can still be found along streams on the western slopes of the Green Mountains.

(46) During the first half of the 19th century, certain developments occurred which contributed to the expansion of industry and commerce throughout Vermont. The Jefferson Embargo of 1807, for example, encouraged the growth of local industry by putting a temporary halt to foreign imports.

(47) The opening of the Champlain Canal in 1823 greatly improved the shipment of goods in and out of the state. (48) <sup>S.P.B.</sup> Towns located at important shipping points developed into bustling, prosperous communities whose docks were busy with boat building, the loading and unloading of cargo, and other industrial and commercial activities.

(49) Because of these developments, and the prosperity enjoyed by many towns as a result, the demand for finished products increased, and goods formerly made in the home were gradually removed to a factory or mill setting. {

(50) Tanneries were established in most towns to process the hides of slaughtered livestock into leather for shoes, and much needed belts for milling machinery. (51) { Oil mills ground linseed for paints and brushes. (52) | And craftsmen such as metalsmiths, blacksmiths, pewterers, tailors, hatters, saddlers, house joiners and others, began to emigrate to Vermont in increasing numbers to set up shops such as this blacksmith shop in Hartland. }

(53) Cloth manufacture first began to move out of farm homes around 1800 with the construction of fulling and carding mills where wool was sized and carded for home manufacture. }

(54) The opening of the Champlain Canal and the 1824 Tariff on Woolens encouraged wool manufacturing in Vermont, and textile mills, such as this former mill in Barre, were established wherever sufficient demand and waterpower existed. { (55) Starch factories, which processed potato starch for textile mills, also began to appear in many towns around the state at this time. }

(56) Along with the demand for finished goods was a need for more permanent homes and community buildings. Plentiful supplies of logs were fed into many a busy sawmill to be converted into clapboards, window sash, window blinds, and other finished lumber. (57)

Brickyards were established in areas with sufficient clay and lime, and kilns were constructed for firing the clay. }

6) 7) 20) 21) 22) 23)

(58) Lime was not only used for mortar, but it was also used as a flux in iron-making, as a key ingredient in plaster, and ~~as an early fertilizer~~ <sup>to improve the soil</sup>. Therefore, lime kilns, where the limestone was burned to a concentrated powder, were constructed in a variety of sites, }

(59) ranging from farmsteads to industrial ironworks. Many lime kiln sites have been recorded west of the Green Mountains ~~in recent years~~, primarily in central and southern parts of the state. }

(60) Deposits of granite, marble and slate were discovered early on, and ~~as early as~~ <sup>by</sup> 1805 stone quarried in Rutland and Pittsford was being floated up to Middlebury to be sawn at the local marble mill. }

(61) Glass manufacturing began in Vermont in 1813 on Lake Dunmore in Salisbury when the Vermont Glass factory began making glassware and window glazing. Other short-lived glass factories were established during the 1820s and '30s in Manchester, Vergennes, Burlington, and Pittsford. }

Long

*Beans*

(62) Up until the middle of the 1800s, the operators of these various manufactories were typically farmers as well. Every farmer plied some trade to supplement his income. It not only kept him busy during the long months of winter, but it also provided a commodity with which to barter for other goods. }

(63) Farmers traded their home-made goods locally, often at the local tavern, grist mill, or in the church yard on Sundays. As transportation networks improved, however, (64) <sup>local</sup> commercial transactions began to take place in village centers which had developed around such desirable commercial sites as crossroads, mill sites, and postal drop-off points. }

*Johnson*

(65) With the development of village commerce, stores, rather than taverns or mills, became the focus of commercial activity. These early stores were usually small, two-story, gable-front structures with large display windows on the ground floor. (66) *Long* In larger towns some of Vermont's first commercial blocks, such as this one in Castleton, began to appear around the 1830s. }

(67) For Vermonters who lived far from these village centers, travelling peddlers, seamstresses and cobblers became an important part of rural life. }

*Long*

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(68) In spite of the commercial prosperity enjoyed by many towns during the early 1800s, Vermont continued to be an agriculture-based economy and the majority of its commercial and industrial enterprises were relatively small-scale and oriented towards a local market. While the canals had greatly improved commerce, (69) overland transport was both limited and expensive. }

(70) Around 1850, however, two revolutionary developments occurred which changed the face of industry and commerce forever. One of these developments had its beginnings in Windsor, Vermont. It was in this brick building, now the American Precision museum, that the system of manufacturing articles with interchangeable parts was first used in the production of rifles and machine tools. (71) This "precision" method of manufacturing was a revolutionary breakthrough for industry and marks the beginning of modern manufacturing and mass-production. It also signalled the advent of the machine-tool industry which would later bring international renown to Springfield, Vermont. }

(72) The second revolutionary development was the coming of the railroad. The Iron Horse not only made the transport of heavy goods easier and less expensive, but it also opened new markets for Vermont products, and supplied Vermonters with a greater variety of factory-made goods than ever before. }

8) (73) The railroad also created entirely new commercial networks, shifting the centers of commerce away from many of the traditional routes such as the waterways and old stage roads. Many towns that had relied on the old routes for their livelihood fell into decline (74) while villages with rails running through them enjoyed unprecedented growth and prosperity during the second half of the 19th century. (75) As the scale and number of commercial institutions expanded, railroad village centers took on an increasingly urban appearance. Rows of multi-story woodframe, brick and stone commercial blocks began to line many a downtown street, (76) with stores on the first floors and professional offices on the upper floors. (77) Some enterprising merchants built enormous structures like this one in Bennington which almost fills an entire block. {

(78) As commerce expanded, many new businesses became possible such as banking, real estate and insurance, (79) { and commercial gas lighting utilities were organized to serve downtown areas and the nearby homes of the wealthy. {

9) (80) The effect the railroad had on industry was no less significant and changed forever the manufacturing character of the state. As mass-produced goods brought in by rail began to compete with those made locally, small-scale industry such as boot and shoe factories, tanneries, small woolen concerns and other manufactories were soon forced to close their doors. {



(81) In some cases, these declining local industries were replaced by a smaller number of large-scale industries. This was especially true of the textile industry in Vermont. By the late 19th century textile manufacture was almost exclusively carried out in the so-called "giant" textile mills such as the Winooski Mill, (82) the Holden-Leonard Mill in Bennington. These mills dominated the lives of their towns, both in the time they exacted from their workers, and in their sheer physical presence. Since turn of the century, textile production in Vermont has steadily declined, and the old mill buildings have either been demolished, or adapted for new commercial and industrial uses. S

(83) Other industries, such as mining, stone and lumber, flourished with the arrival of the railroad since it made overland shipment of heavy materials much less costly. S

(84) Copper was one of the first large-scale mining industries in Vermont to benefit from the railroad. Mining companies were established in Vershire, South Strafford, Corinth and Richford, and skilled Cornish copper miners from England made up the bulk of the workforce. (85) These mines were enormous operations consisting of blast furnaces, smelting houses, warehouses, blacksmith shops, coal and lumber houses, and much more. In 1880, a peak year, Vermont was the second largest copper producer in the country. S

(86) While most of the structures associated with Vermont's copper boom are no longer standing, the old Ely Mine in Vershire is a virtual ghost town. There, one can still find substantial remains including (87) flues, mining shafts, refuse piles, (88) and former roasting beds.

(89) The immigration of skilled Welsh slate quarriers from Wales and Pennsylvania and the introduction of the railroad to the western portion of Rutland County in 1849 prompted the rapid growth of the slate industry between 1850 and 1870. (90) The Vermont slate belt centered largely in the towns of Wells, Poultney and Fair Haven. In addition, whole new settlements, such as West Castleton, sprouted up near the quarries, mills and slate yards. Most of the industrial structures, and homes of the Welsh slate workers are no longer standing. (91) Instead it is the result of their labors, the colorful slate roofs (92) and marbelized slate mantels that survive as legacies of this important part of Vermont's industrial heritage.

(93) Although marble had been quarried on a local scale as early as the 18th century, after 1850 the railroad allowed for the transport of much heavier blocks of stone, and Vermont marble was soon manufactured on a large scale for the construction of public and private buildings and memorials throughout the United States.

small  
marble  
works

2653

(94) Between 1890 and 1915 both the Vermont marble and slate industries reached their peak, producing respectively the first and second highest valued stone product in their industries in the United States. While the slate industry was on the decline by World War II, Vermont marble is still a highly valued stone, and Proctor continues to be the center of Vermont marble production.

VT  
Marble

2735

(95) Granite was quarried as early as the 1790s, but it was not until the railroad came to towns like Barre, Hardwick, Ryegate, and Bethel that the granite industry developed to any significant degree.

gran

(96) With the help of Scottish quarrymen and skilled Italian stone carvers, Barre quickly developed into the chief granite producing center in the world. While Barre granite has occasionally been used for building construction, it has mostly been used for making memorials.

stones  
bars

98 memorial

(98) Housing for immigrant workers employed in the stone industries varied from company to company. Initially workers stayed in boarding houses, the homes of fellow workers, or crude shanties located near the quarries and mills. Eventually some companies built worker housing, while others provided financing and materials for workers to build their own homes.

Hous-

(99) The lumbering and wood products industries changed in both organization and scale during the second half of the 19th century. In the 1850s, a Mr. Lane of Plainfield, Vermont invented the first portable sawmill. (100) In 1863 he moved his company to Montpelier and began manufacturing his sawmills on a mass-scale for world-wide export at the former Lane Shops.

X (102) The invention of the portable saw, together with the railroad, and the use of steam power instead of water, made remote stands of virgin timber more accessible and sawmilling developed into a large-scale industry for the first time in Vermont. |

9/ (103) Since the railroad made the long distance shipment of logs much easier, Burlington began processing Canadian logs on its waterfront and by 1870 the Queen City ranked as the third largest sawmilling center in the country. {

(104) During the last quarter of the 19th century logging and sawmilling activity pushed further and further into the Vermont mountains, resulting in the growth of small mill villages. Few of these once bustling sawmilling centers survived, however, and places like South Glastonbury have disappeared with hardly a trace. {

(104) <sup>much</sup> Most of the logging activity of the late 19th century was for sawmilling purposes; however, large tracts of forest were also being logged for pulp wood, used in the manufacture of paper. }

106  
(105) In 1870, William Russell of Bellows Falls became one of the first people to use wood pulp instead of rags in the manufacture of paper. Thanks to Russell, the paper industry in Bellows Falls quickly became one of the largest such centers in the country. {

7  
(106) While the ironmaking industry had mostly died out with the coming of the railroad, iron-working flourished in towns such as Bellows Falls, St. Johnsbury and Brandon, among others. {

8  
(107) The manufacture of platform scales was perhaps the most notable iron-working industry of 19th century Vermont. Invented by St. Johnsbury native Thaddeus Fairbanks, the platform scale was being marketed world-wide by the late 1840s. (108) The Howe Scale company in Brandon, and later Rutland, ranked second in the state in the production of platform scales; (109) today its buildings are being used for incubator space for new businesses. |

(110) Although most of the original Fairbanks scaleworks was destroyed by fire in 1972, scales are still being manufactured in St. Johnsbury to this day. {

(111) By 1900, industry had come a long way from the mill-on-the-stream days. Steam and electric power had replaced water power by this time. Nonetheless, new ways of harnessing power from Vermont's waterways had been discovered, and by the turn of the century, hydro stations were converting waterpower into electricity. Some of the early power stations were located in old mill buildings, {

(112)<sup>3</sup> but as demand increased special hydro stations and dams were constructed. The 1927 flood destroyed a number of early hydro-plants, many of which were replaced by larger stations still in use today. ⚡

(113) Among the first places to benefit from electricity during the 1880s and '90s were the commercial downtowns of some of Vermont's larger towns. Electricity not only allowed business hours to extend further into the evening, but it also powered a new form of urban transportation- the electric streetcar. ⚡

10) " )  
(114) The streetcar era marked the heyday of Main Street commerce. People living on the outskirts of towns like St. Johnsbury, St. Albans, Burlington, and Rutland, now had easy access to Main Street, and the number of shoppers <sup>began</sup> ~~descending~~ upon these commercial centers each day ~~began to multiply.~~ |

(115) The larger size, quality of materials and (116) attention to detail of many commercial buildings constructed during the late 19th and early 20th centuries reflect the prosperity and optimism of the time. |

12) 13) 14) }  
 (118) The Service Building in Rutland, built in 1929, is the most impressive commercial structure built during this period. It is Vermont's first skyscraper, and features an Otis Elevator, named after Elisha Graves Otis of Halifax, Vermont, who is credited with inventing the first successful elevator. }

15) 16) 17) 19) } 32:18  
 (119) No sooner had the electric railway hit the streets of Vermont's big towns than the automobile made its debut. By the 1920s motoring was fast becoming a popular pastime for a growing number of Vermonters, and highways soon replaced railways as the dominant commercial arteries. }

(120) Since most downtown areas were ill-equipped to deal with this new form of transportation, a growing number of business and commercial establishments re-located along roads skirting the edges of these towns. }

19) 37:14  
 (121) Vermont's tourist and recreation industries greatly benefitted from the automobile as tourist cabins, boarding houses, and restaurants began to dot many a well-travelled route. }

(122) Since World War II many of the industries traditionally associated with Vermont have gone into decline, to be replaced with such major employers as IBM, General Electric and Digital. As the traditional industries disappeared, many of the buildings and sites associated with them have either been abandoned or torn down. }

(122) During the 'sixties and 'seventies the construction of large shopping malls began to compete with, and in some cases drain commercial activity away from some of Vermont's larger downtowns. S

(123) As business <sup>slowed</sup> fell in the downtowns, whole commercial blocks were abandoned. (124) Fortunately, during the late 1970s, citizens concerned about the vitality of their downtowns, and the competition from growing strip development, turned to historic preservation as an effective tool to keep economic activity in the heart of the community. (125) The renewed interest in saving downtowns and village centers led to the revival of many commercial buildings (126) through facade restorations, the removal of artificial siding material and other preservation techniques. S L

(127) While the demolition of individual commercial buildings in downtown areas has slowed significantly, industrial buildings continue to be some of the most threatened resources in the state. }

(128) One problem with renovating historic industrial buildings is the potential difficulty of finding new uses for these often enormous structures. Finding financing can often be tricky. And building codes, fire codes, and the removal of hazardous materials such as asbestos have also been a deterrent to the rehabilitation of these buildings. |



<sup>30</sup>  
 (129) At the same time, however, some people have realized both the value of these buildings and sites, (130) and their economic potential. As a result, throughout the state industrial structures, even whole complexes, have gained new life as (131) shops, theatres, museums, recreational sites, (132) residential complexes, offices, incubator space, and more.

(133) But the benefits of preserving Vermont's historic commercial and industrial sites and structures are not only economic. These sites also constitute a large, and largely unknown, part of our identity as a state. (134) They remind us that there is more to Vermont, and Vermont's history, than farms and forests. (135) That the story of many a Vermont town began with the construction of a mill, or small factory. (136) That it was not just the products of the soil, but what lay beneath the surface of that soil, the copper, slate, granite and marble, that made Vermont what it is today. (137) The challenge we now face is how to find a way for those buildings and sites which represent this rich and multi-layered heritage to continue to be a useful and viable part of our communities, and the state as a whole. (138) (139)

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INDUSTRY & COMMERCE: Slide Subject List

- 1) Covered bridge, mill buildings, Tunbridge
- 2) Warner Block
- 3) Industrial buildings reflected in river
- 4) Vermont: A Special World (use book)
- 5) View of Jackson Farm
- 6) Beers' Atlas showing marble quarries
- 7) Historic photo of men posing in front of mill
- 8) Brandon Falls of Neshobe, C.B.J.
- 9) Abandoned lime kiln
- 10) Commercial block, Montpelier
- 11) Destruction of Thomasi Block, Montpelier
- 12) Marshfield Village Store
- 13) Commercial block, St. Johnsbury
- 14) Aerial of Bellows Falls
- 15) Ruins of lime kiln
- 16) Proctorsville mill fire
- 17) Old Red Mill, Jericho
- 18) Brick hydro station
- 19) Timber crib dam
- 20) Groton store
- 21) Brick mill perched on falls on Otter Creek, Vergennes
- 22) Robinson paper mill
- 23) Sabin Quarry, C.B.J.
- 24) Remains of blast furnace
- 25) Ruins along stream
- 26) East Bethel mill, C.B.J.

- 27) Rendering of pioneer chopping wood
- 28) Rendering of woman churning butter
- 29) Rendering of man making potash
- 30) Waterfall
- 31) Robinson sawmill, Calais
- 32) Mill dam, Calais
- 33) Beers' map of industrial node
- 34) Beers' map showing paper mill village
- 35) Historic photo of Bradford paper mill
- 36) Rendering of pig iron manufacturing
- 37) Rendering of view of iron manufacturing plant
- 38) Train
- 39) Former iron master's house
- 40) Iron furnace ruins
- 41) Mound ruins
- 42) Beers' map showing coal kilns
- 43) Etching of mound kiln and collier
- 44) Historic photo of brick charcoal kilns
- 45) Ruins of mound kiln
- 46) Brick mill building
- 47) ~~Beers' map Bellows Falls canal~~ *(see below)* photo of Ch. Canal Lock
- 48) Rendering of portage
- 49) Stone mill building
- 50) Beers' map, tannery
- 51) Wallings' map, oil mill
- 52) Blacksmith shop, Hartland
- 53) Beers' map, carding machine

- 54) Historic photo, Barre woolen mill
- 55) Wallings' map, starch mill
- 56) Frame house, Salisbury
- 57) Brickyard, Brattleboro Photos (or use Beers)
- 58) Ruin of lime kiln
- 59) Ruin of lime kiln with red smoke stacks
- 60) Slate quarry
- 61) Windows
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- 63) Bayley-Hazen tavern
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- 65) Chelsea stores
- 66) Castleton commercial block
- 67) Historic photo of peddler
- 68) Agriculture photo
- 69) Horse-drawn wagon with block of stone
- 70) Precision Museum, Windsor
- 71) Close-up of Precision Museum
- 72) Railroad (see Culture & Govt #66) *1912 of the no. 1000, polit. est. 1400*
- 73) Historic photo of Rutland RR Center
- 74) St. Johnsbury photo/rendering of downtown
- 75) Bristol Main Street
- 76) Commercial Building, Montpelier
- 77) Hotel Putnam, Bennington
- 78) Small bank, Springfield
- 79) Gas lamp
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- 81) Winooski mill
- 82) Birds' Eye view of Bennington
- 83) Mill workers at quarry
- 84) Historic view of Vershire copper mine, housing
- 85) " " " " , industrial
- 86) " " " " , today
- 87) Copper mining flue
- 88) Roasting bed
- 89) Historic photo of Welsh slate workers
- 90) West Castleton map
- 91) Slate roof
- 92) Marbelized fireplace
- 93) Historic photo of Oxen bringing marble into mill
- 94) " " of marble mill near rr tracks
- 95) Historic photo of Vermont Marble Company
- 96) Historic photo of Granite Railroad
- 97) Historic photo of Jones Brothers, granite shed
- 98) Memorial
- 99) Ryegate worker housing
- 100) Historic photo of log drive, Connecticut river
- 101) Lane shops
- 102) Historic photo of men with portable saw
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- 105) Historic photo of old sawmilling center
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- 107) Iron-working manufactory
- 108) Rendering of Fairbanks scaleworks, St. J.

- 104 ~~108~~) Howe Scales advertisement
- 110 ~~109~~) Howe Scales building
- 111 ~~110~~) Ruins of Fairbanks scaleworks
- 112 ~~111~~) Hydro dam
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- 117 ~~116~~) Detail of commercial building
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- 122 ~~121~~) Aerial view of IBM
- 123 ~~122~~) Shopping mall
- 124 ~~123~~) Abandoned commercial block, St. J.
- 125 ~~124~~) People fixing storefront, Middlebury
- 124 ~~125~~) Pennysaver being restored
- 127 ~~126~~) Pennysaver after restoration
- 128 ~~127~~) Abandoned building
- 129 ~~128~~) Fair Haven Specialty- Former arms mfg
- 130 ~~129~~) Lane Shops before re-hab
- 131 ~~130~~) Lane Shops after re-hab
- 132 ~~131~~) Woolen Mill sign
- 133 ~~132~~) Maltex Building
- 134 ~~133~~) Precision Museum
- 135 ~~134~~) Blacksmith shop

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- 136 ~~135~~ Sawmill
- 137 ~~136~~ Quarry
- 138 ~~137~~ Mill/feed store
- 139 ~~138~~ Office space
- 140 ~~139~~ Lime kiln in fall

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**EXTRACTIVE INDUSTRIES** (Manufactures a products from soils extracted from the earth, i.e.- clay, sand,

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MEAT PROCESSING

SUGAR MAKING

## The Industrial Archeology of Chittenden County

by Victor R. Rolando

(a slide-illustrated presentation to the Chittenden County Historical Society on November 21, 1993 at the Fletcher Library in Burlington, Vermont)

Vermont is rich in remains of industries that date to the early 19th century. Foundations of mills, long since abandoned to the ravages of nature, dot the countryside, especially near the falls of good-running streams and rivers. Stroll along any river or stream for any length of time and one is bound to happen upon the remains of a dam, a flume, or a mill. They are remains of saw or grist mills, or marble cutting and finishing mills, or woolen mills. They are ruins of foundries where thousands of farm tools and parlor stoves were cast. They are what are left of little pockets of industry where early Vermonters made brooms, shoes, potato starch, and horse shoes. They were the 18th- and 19th-century versions of today's IBM, GE, and DEC.

Vermont was blessed with many fine-running streams that allowed men with imagination, ingenuity, and financial backing to tap the energy of all that falling water, and convert it into useful energy. It was a blessing that on one hand allowed Vermont industries to compete with those farther away, closer to markets, but who also had to include in their production expenses the cost of fuel that powered their mill machinery. But it was a disguised blessing, because the steam-powered industries improved their efficiencies, while Vermonters remained loyal to waterpower, until it was too late, and too costly to convert. That is one of the reasons why today we can find all those remains, because new industries, by the most part, did not rise on the foundations of former industries; why we have a time-machine look into past industries that other, more successful industrial parts of the nation, cannot have because heavy industry did succeed there. And it is just one of the reasons why many years ago, I changed my area of interest in early industries to Vermont. Because I discovered Vermont is rich in industrial remains.

Today I am going to talk about industrial archeology, in Chittenden County in general, and at Winooski Falls in particular. Chittenden County offers a wide array of remains of industrial activity. Obviously, I cannot hope to cover the entire spectrum of industrial archeology in the whole county in 30 minutes. I am therefore limiting my range to those early industries that I spent the past number of years

researching in Vermont. Bricks, for example, the building blocks of industrial structures, were made in Chittenden County by the Drury family. It is said that in the 105 years of their operation, more than 500 million bricks were made here. Look among any pile of bricks within 100 miles of Burlington and you will most certainly find a brick marked Drury.

Bricks are a great dating mechanism. From the marking on a brick found in a ruin, its maker and date of manufacture give us an approximate date for the ruin. Less obvious remains are those of lime kilns, where limestone was burned to make lime that was used for mortar, the glue that tied bricks together; for agriculture, to stimulate the soil; for the tanning industries; as a filter in coal gas production; and for many uses in chemical industries. This is the surface ruin of a lime kiln that was in operation in the 1880s-1890s along Lime Kiln Road in Charlotte. Lime was also burned at other places in the county, for example just off Depot Road in Colchester, and also near Stave Point at Malletts Bay. More familiar were the lime kilns across the highway from St. Michael's College, where lime was burned from the War of 1812 to 1971. The site is today marked by a massive single-unit poured-concrete structure and a kingdom of scattered firebrick with such markings as LEHIGH, BESSEMER, POWER, D-TYRONS, ALUSITE, in addition to many red DRURY bricks. Less obvious yet are the remains of bloomery forges where some of this county's first wrought iron was produced.

What is industrial archeology? Industrial archeology is the study of the surface remains of industry. Industrial archeology evolved from historical archeology, which is the study of cultural remains dating to the period of contact between Native Americans and European settlers. Pre-contact study is known as prehistoric archeology.

Since contact spread slowly across the continent, generally from east to west, the period of pre- and post-contact is therefore also a matter of geography. Following quickly on the heels of settlement was the building of saw and grist mills, and soon after, with the discovery of deposits of iron ore, the construction of ironworks. Historical archeology and industrial archeology therefore overlap nearly identical periods of time. But, as I said, industrial archeology is the study of the surface remains of these industries, such as this lime kiln ruin in Cavendish, meaning that industrial archeology generally does not involve excavation. It does, however, lean heavily on the documented history and attempts to find a correlation between the documented word and the physical field evidence.

Industrial archeology, known as "IA", is, therefore, a discipline that occupies itself with the study of such things as mills, along with their associated waterpower systems and manufacturing processes, but also workers' housing and social patterns. It even gets involved in economics, determining the relative efficiency of industries through analysis of such things as available power, access to market, and costs and dependability of labor. It is the study of wood, iron, and stone bridges. The study of the remains of mineral processes, and attempts at re-enacting these ancient processes, also occupies many IA researchers, who delve into the manufacture of iron and steel, copper, building stone, etc. In short, all the mills of the country, be they associated with pre- or post-industrial revolution technology, are within the scope of the discipline of industrial archeology.

There are many who believe that the industrial revolution never spread into Vermont, that this state was a bystander in the sweeping industrial changes that were witnessed in the more traditional industrial states of Pennsylvania, Massachusetts, New York, and New Jersey. But research into the iron industry in Vermont has uncovered some enlightening data. For example, the first use of preheated blast furnace air, which reduced consumption of charcoal fuel and thereby yielded more pounds of iron per bushels of fuel, is generally accepted to have taken place at Oxford Furnace in New Jersey, in 1834. Pre-heated blast has been found to have been practiced the year before in 1833, at a blast furnace in Bennington, Vermont. Charcoal kilns, for the conversion of hardwood into fuel for forges and furnaces, are reported in journals as being many shapes, depending on the variables of the industry; round being the most common, conical the most efficient in terms of yield, and rectangular the most efficient in term of construction cost. From the close study of charcoal kiln remains that lie scattered up and down the spine of the Green Mountains, all three: round, conical, and rectangular, have been found to have operated at one time or another in Vermont.

One of the most intriguing studies I did in the course of my research into the industrial archeology of Vermont was that pertaining to ironworks that were established at Winooski Falls by Ira Allen. Intriguing because years ago, when researching the 18th- and 19th-century iron industries of western Massachusetts and northwestern Connecticut, I happened upon Ethan Allen's part in the evolution of the iron industry at Salisbury, Connecticut. When he drifted out of the ironworks picture there, I assumed his Revolutionary War activities were the end of the story. It wasn't until I became

involved with the iron industry in Vermont that I discovered that younger brother Ira continued industrial pursuits and land speculation where older brother Ethan left off.

When Ira Allen returned to Colchester following the end of the Revolutionary War, he commenced the development of the waterpower resources of his vast land holdings in northern Vermont. These included saw mills, grist mills, and ironworks that produced bar iron, mill irons, forge hammers, and anchors. His usual arrangement was to lease the mill rent-free, typically for seven years, with an offer to buy it back at a fair market price.

To put Ira Allen's ironworks along the Winooski River into historical context, we must start some 150 years before, to 17th-century New England. When the Pilgrims discovered bog ore in many coastline marshes and inland ponds in eastern Massachusetts, ore samples were sent to England for analysis.

The result was the formation of the Company of Undertakers of the Iron Works of New England. Their first ironworks venture at Braintree failed, but the second at Saugus succeeded. The blast furnace at Saugus was fired in the spring of 1648 and the works operated until 1675. Although it operated intermittently, it has been recognized as the birthplace of the American iron and steel industry. Saugus Ironworks is today a National Historical Park, containing the reconstructed blast furnace plus a forge, finery, rolling mill, and worker housing.

In 1700 the king of England was called upon to mediate a border dispute between New York and Connecticut. Part of the settlement included a survey of the border, which generally ran north to south, along the crests of the Taconic Mountains which separated the two colonies. In the process of the survey, high grades of iron ore were discovered near the tri-state corner of Massachusetts, New York, and Connecticut. A bloomery forge was built in 1734 by Thomas Lamb at nearby Lime Rock, Connecticut. More forges soon followed at Canaan, Colebrook, Kent, Cornwall, and Salisbury. Ore for Lamb's forge came from Ore Hill in Salisbury. Business was profitable, and Lamb bought additional mining property and the water rights to Wononscopomuc Lake. Around 1760, he sold it all to the Owen brothers, who in turn sold it in 1762 to the partnership of Samuel and Elisha Forbes of Canaan, John Hazeltine of Uxbridge, and a 22-year-old adventurer from Cornwall named Ethan Allen.

The partnership constructed a blast furnace at the outlet of Wononscopomuc Lake, which was the

first blast furnace built in the Taconic Mountains of western New England. A small prosperous community called Furnace Village, today's Lakeville, developed around the furnace. Allen soon tired of staying put, sold his share in the successful ironworks to Charles and George Cadwell in 1765, moved on to Northampton, Massachusetts, and went into the silver mining business.

Meanwhile, dozens of blast furnaces sprang up all over the Taconics of Massachusetts and Connecticut, many providing valuable ordnance during the Revolutionary War. One of these, the Lakeville furnace, provided iron that was cast into guns and cannon at the nearby Salisbury cannon foundry. At Ancram, New York, an ironworks cast parts of the huge chain initially planned to block British access to Lake Champlain at the head of the Richelieu River near the Canadian border; it was finally strung across the Hudson River at West Point. Continuing his ever-northward migration, Ethan Allen followed the frontier into Vermont and kept himself, plus New York and the British, busy in other ventures. Down at Lakeville, Connecticut, meanwhile, the furnace continued in operation until 1823. It outlived not only Ethan and Ira Allen, but all its founding partners.

Much of Ethan Allen's ironworks and horse-trading expertise rubbed off on younger brother Ira Allen, who in turn became one of the progenitors of Vermont's iron industry. The Allens, maintaining their former contacts in Connecticut, ordered much iron hardware from these Connecticut ironworks for the construction of forges in northern Vermont. Available historical information hints that Ira Allen, if not attempting to establish a personal empire in northern Vermont, then at least was trying to make a killing in the land business, of which the industrial segment might not have been his main thrust. As with a lot of historical data, a degree of practical reading-between-the-lines and a familiarity of the industrial processes offer explanations where specific data or physical field remains are lacking.

In the January 19, 1789 Vermont Gazette, Ira Allen advertised "Will be wanted on April 1, 40 men to raft logs, Onion River to Quebec, men to clear lands, etc. Has three flows for Iron Manufactories, at Onion River lower falls, falls of the river Saxton in Shelburne, lower falls of the river Missisquoi. Will lease either of the three places for 7 years free from rent at the end of which will pay a fair price for the forge, etc."

Although I have not been able to confirm, either through surface evidence or archival data, that a forge was built at the lower falls of the Missisquoi before the Barney brothers built their forge at

Swanton in 1799, this early map of the region, possibly representing the period of French occupation, shows an abundance of iron ore all about the falls, so that the possibility that Allen, or somebody else, might have built a forge there at or before that time remains a possibility. Certainly, Ira Allen had in operation many saw mills from the references of logs and lumber being rafted north to Canada. Also, Allen's reference to Saxton's river in Shelburne might have been to Frederick Saxton, with whom Allen had many dealings, and who also owned land in Shelburne.

The year of 1789 was one of famine and suffering in Vermont. The Reverend Nathan Perkins, who rode through Vermont from April 27 to June 12, 1789, recorded scenes of poor and scant food, getting worse as he traveled north. Arriving at Governor Chittenden's house in Williston he told of visiting about 50 towns and was almost starved because he could not eat the coarse fare provided. He described pine splinters used instead of non-extant candles, and families with small children all living in one room and sleeping in a common bed full of fleas. Yet in this atmosphere Ira Allen was still able to lease some of his mills, but he was obliged to furnish men with all the necessaries and many of the farmers depended on him for goods and seed.

Not only were food and everyday furnishings scarce, but also hard cash and continued so for decades. Ira Allen was also by this time very much in debt to Quebec merchants, and he ran his saw mills night and day in hopes of paying past bills due to them. He even offered to sell to a Canadian firm a township in Vermont at a low price, which he hoped would more than pay all of his and his debts. Things were not going well for Ira Allen.

Although there are records of Allen's lumber making its way to Quebec, no mention of iron being shipped from the Burlington area to anywhere is made until July 27, 1789, when Stephen Keyes and Jabez G. Fitch, at the time friends of Allen, petitioned Lord Dorchester to allow pig and bar iron to be shipped into Quebec, because the logs and lumber were not sufficient to pay for goods purchased there. There is no record of pig or bar iron being shipped as the result of this petition, but what is significant is that the petition mentions pig and bar iron, two different types of iron, made by two totally different processes. Ira Allen was planning to operate, or was already operating, a bloomery forge for the manufacture of bar iron, and a blast furnace for the manufacture of pig iron.

Ira Allen's forges descended from a technology that dates to antiquity. The great-great-

grandfather of today's modern blast furnace was the catalan forge, which operated during the 12th century in the mountains of Catalonia in northeastern Spain.

It was a simple structure, only 5 to 6 feet high and made of clay that baked solid when heated.

A large opening was built in the direction of the prevailing winds such that natural convection of heat up the chimney drew in fresh, outside air through the front. When winds were insufficient, the nozzle of a small foot-operated bellows was inserted through a small hole, called a tuyere, in the back wall of the forge. A large piece of iron ore was put into the forge, was thoroughly covered over and under with charcoal, and the charcoal set afire. As it burned, the piece of iron ore was turned with long tongs so as to continually expose it to maximum heat. When sufficiently heated, the piece of hot, pasty iron was dragged out of the forge and hammered into something useful. The heated iron was called a bloom so the furnace was called a bloomery forge. Obviously, iron made in this fashion contained many pieces of non-iron material, such as stones, clay, and unburned charcoal.

As the demand for a better quality iron increased, so the technology evolved. The small catalan forge grew to a large, stone table-type structure called a hearth, and the small foot-operated bellows grew to meet the demand for more air to fan the flames of larger quantities of burning charcoal. Large, 100-pound blooms were hammered on stone floors to squeeze out impurities, the process known as shingling. And when enough of the bloom was clean of impurities, a piece of it was cut off and worked at a water-powered hammer. In the effort to increase production, forges grew in size, growing taller, increasing the draft, and thereby increasing the temperature of reduction. And when that critical temperature was reached, something very natural to us, but not so common hundreds of years ago happened - the iron melted.

Melted iron was of little use to a process that involved hammering, because in the process of raising the reduction temperature inside the forge enough to melt the iron, it also effected a chemical reaction within the forge that allowed carbon to jump the barrier from the charcoal to the iron, creating a hard, carbon-saturated iron. Troublesome at first to the ironworker, who didn't quite know what to do with an iron so hard that it shattered when applied to the hammer, it quickly revolutionized the iron industry as ironworkers came to realize they could now directly mold, or cast the iron, into useful items, and that these molded items, due to their carbon content, were very hard. Thus the name, cast iron, was



born. It also divided the industry in two, one that continued to make soft, malleable iron the old catalan forge way, and the other that made cast iron in tall furnaces, called blast furnaces from the forced air blast needed to maintain the high reduction temperature inside the furnace. And whereas the blast furnace at first cast such things as stove plates and fireplace backs right on the casting floor of the furnace, in time, blast furnaces just cast ingots of iron that were transported to another arm of the industry, the foundry, where the ingots were melted in cupola furnaces and cast into custom work demanded of the day.

At the blast furnace, to satisfy the needs of various size foundries, iron was sometimes cast into large and small ingots, as shown here. The large for the large foundry and the small for the small foundry. The industry, yet being small in comparison to the modern industry, ironworkers were still essentially of rural stock and worked at the furnace when the demand for iron existed, and worked at their farms when not. They related names to things that reflected their rural character, so it should be no surprise that they saw in the large and small ingots cast at the furnace a mother pig with her suckling young, thereby naming the larger ingot the sow and the smaller the pigs, thus lending name to what became known as pig iron.

During the time of Ira Allen's ironworks, blast furnaces measured about 20 feet square at the base and were about 20 to 25 feet high. Air blast was blown by a huge pair of alternately operating bellows, powered by giant waterwheels, thus requiring their being near a strong and dependable-running stream, preferably at a falls. If we were to look at a cross-section of the furnace, we would see layers of iron ore, the brownish layers, charcoal, the black layers, and limestone, the thin white layers. Charcoal provided the fuel, and limestone provided the flux. The intensely hot-burning charcoal at the bottom of the furnace, called the hearth, fanned by the air blast pumped in through the pipe at the left, caused a chemical reaction between the iron, charcoal, limestone, and various impurities. It allowed the iron to separate out into the bottom of the hearth in a molten mass. Floating atop the molten iron, like cream in an old-fashioned bottle of milk, was molten slag, which contained all the non-iron material. To make room for the accumulation of more and more iron, from the charge moving down through the furnace from above, slag was periodically drawn off through a slag hole hear the top of the hearth. When molten iron started flowing from this top hole, the hearth was filled with iron and the molten iron was drawn out

through an opening at the floor of the hearth. Both holes were plugged and the process resumed. The process continued for months, stopping only when ore or fuel ran out, orders for iron ended, or the river froze and the waterwheel stopped.

The sites of 38 blast furnaces have been identified as having operated in Vermont between the 1780s and 1880s. Identifiable surface remains exist at 18 sites, and relatively complete ruins can still be seen today at Bennington, East Dorset, Pittsford, Forest Dale, and Troy. Collapsed remains can be seen at North Dorset, Chippenhook, West Haven, and Tinmouth. Minimal surface evidence of blast furnaces have been found at Highgate, Sheldon, Tinmouth, Brandon, Plymouth, Vergennes, Manchester, New Haven, and Shaftsbury. No surface evidence what-so-ever have been found at furnace sites in Waitsfield, Bristol, Weybridge, Fairfield, St. Johnsbury, and Woodford. The only blast furnace site identified in Chittenden County is Ira Allen's indirect reference in 1789 regarding exporting pig iron to Canada. In addition to Allen's forge at Winooski Falls, forge sites have been identified in Chittenden County at Williston, Shelburne, Westford, and Milton. No surface evidence such as slag or iron having been found at any of these.

Throughout 1791, Ira Allen was corresponding to people throughout New England, buying and selling, and as usual, trying, mostly in vain, to collect from his many debtors to satisfy his pressing creditors. Entrepreneurs throughout Vermont were also showing interest in ironworks, for example, at Tinmouth on March 21, 1791 where he signed a contract which called for building a 50- by 40-foot forge building with two forge fires, two 40- by 30-foot buildings storage of charcoal, and houses for forge workers, all to be completed the following December.

Early in 1792 Allen was preparing to construct the largest forge that he had constructed to date. Taking advantage of industrial connections in northwestern Connecticut, he sent John Stevens there to obtain the hammer, bellows, and other parts, and also to collect money due in Connecticut and western Massachusetts. Stevens wrote from Canaan, Connecticut on January 29 that it was "hard to collect any debts, cash scarce."

He sent the articles wanted for the forge and wrote that his nephew, a good saddler, is going up to Burlington; also one Linus Allen, a blacksmith, and they may locate there. On March 12, Allen drafted and signed a contract and specifications with Daniel Hurlburt and Jacob Johnson in which the latter

agreed to build the large new anchor shop and forge in Colchester. The cost was to be £460 and Allen was to furnish all the materials and pay them money, cattle, and new lands in Essex, Jericho, Georgia, and New Huntington or the Two Heroes. The next day, March 13, he contracted for Israel Burritt to build another 50- by 40-foot forge house, this time at Shelburne; payment to be made in wheat, at his mill, and neat cattle. On April 6 Israel Burritt and Hiram Imus agreed to build the a flume for the forge at Shelburne with Allen furnishing boards, logs, irons, nails, brick for the chimney and leather for the bellows; also "two barrels of pork and 20 gallons of rum while the work is doing." Due to the scarcity of cash, the workmen employed in building his many mills had to be supplied with rum, pork, flour, butter, and milk. If he had not carried on these many enterprises and been able to take and make payment in commodities, he would have had to sacrifice his lands at a very low price to support his family.

The 50- by 40-foot dimensions of the forge at Tinmouth, or 2000 square feet, is interesting because that dimension also occurs in Allen's specifications for his forge at Shelburne. A forge twice that dimension was excavated in 1961 at Charlotteburg, NJ. This forge operated from 1764 to about 1785, about contemporary with Allen's. It measured about 4,000 square feet, double that of Ira Allen's, Tinmouth forge, but also had twice as many forge fires. Note that at Charlotteburg, the middle trip hammer in the upper center serviced two forge fires, one on each side. One piece of iron could be worked at the hammer, while another piece of iron was heating. Waiting for work to come to temperature was avoided. The farthest waterwheels of each side provided bellows power. Allen's specification for two fires at Tinmouth in exactly half the floor space might well have hinted at a half the size of the Charlotteburg forge, that is, the same 2-to-1 hearth-to-trip hammer arrangement per each 2000 feet of forge area. Might that not also been the practice for Allen's 2000 square foot forge at Shelburne?

On November 20, 1792, Ira Allen leased to Aaron Brownell of Colchester three forges and an anchor shop with the stipulation that Brownell keep a daily register of the weight of iron, deliver every month to Allen a part of the iron in return for the use of the forge, and pay £5 every month for use of the anchor shop, in return for which Brownell had a reasonable share of the pasture and hay. Allen advanced 200 bushels of wheat, 2 barrels of pork, and goods to clothe the workman for which Brownell was to pay in 6 months without interest.

By the fall of 1793, it was estimated that Ira Allen owned about 2,000 acres of land in Shelburne on which are several farms, a sawmill, gristmill, a forge nearly completed, and that he owned about 20,000 acres of land in Burlington and Colchester. At Burlington he had large improvements which included two saw mills, one grist mill, two forges and an anchor shop that were not yet completed, and a number of houses and barns.

A lease offer he published January 3, 1794 mentioned the newly built college at Burlington plus mills and an ironworks at the Winooski Falls within 2 miles of the bay. On June 15, 1795, Joseph Mozier leased one fire at Allen's forge for 50s per month along with the use of a house, repairs to the house to be split between Mozier and Allen. On November 15, 1795, Aaron Brownell leased the anchor shop and a forge for £60 and £50 and year, respectively. On the expiration of Brownell's lease on December 8, 1796, Jerusha Allen leased the forge and anchor shop.

The 1796 Whitelaw map of Vermont indicated ironworks along the Winooski River in the vicinity of the falls, but on the Colchester side of the river. To indicate an ironworks, Whitelaw used the Mars symbol, a circle with an arrow pointing to the upper-right, which in alchemy stood for iron. The 1810 version shows an ironworks symbol on the opposite side, Burlington side, and slightly downstream.

The symbol remains on the map to 1821, raising questions as to whether the forge actually remains in operation there to that date, which is unlikely, or maybe the publishers merely neglected to remove the symbols from their master copy.

Inspections of the area above and well below the falls have been made and especially at seasons of low water, but as expected, no surface remains of any 18th- or early 19th-century ironworks have been found. Whatever forge slag was discarded here by Ira Allen's ironworks over 200 years ago has long since washed downstream to the river flats and is hidden in sand and gravel bars.

On-site comparison of the 1796 map to the twists and turns of the river still convince me that Allen's ironworks were somewhere in the direct vicinity of the falls. Due to the height of the main falls downstream of the bridge, I suspect it would have been easier for him to harness the shorter, upper falls, that are just upstream of the bridge. The whole area of has undergone extensive industrial development, completely changing its appearance since Ira Allen's days.

This 1836 map of the area already shows an upper and lower dam, with a canal diverting water off to the north of the lower dam to power mills, which is why the street was named Canal Street. The Beers 1869 map shows a number of mills crowding about the falls, the Burlington Woolen Mills along West Canal Street, taking advantage of the lower falls, a flour mill hugging the Burlington side of the lower falls, and the Burlington Cotton Mill at the upper falls. Note the Edwards and Stevens machine shop and foundry complex on today's site of the Champlain Mill, which I will briefly discuss in a few moments. In this undated photo, probably taken about the turn of the century, a covered bridge is seen connecting Burlington with Colchester. Note the mill clinging to the side of the cliffs to the right of the lower falls. Today dominated by the new Green Mountain Power dam, the river tumbles over some small rapids, passes quickly under the bridge, and plummets over the falls before roaring through a tight, curved gorge just below the bridge. Whole trees have been seen running this gauntlet during spring thaw, but those brave enough to walk out to the edge can still find evidences of bygone industrial activity, such as this large iron eye that has survived the ravages of floods, ice, and run-away trees.

The Shelburne Falls area has likewise been inspected many times without locating any specific iron-making related evidence. Some bits of badly corroded iron and a piece of burnt-end brick were found, which might have been from a blacksmith shop that stood just northeast of the bridge. According to the 1796 Whitelaw map, an ironworks was located on the south side of the river, opposite a saw mill, both above the falls. But in a description of a flood in 1852 that washed away all mills at this site along with many mills farther downstream, no mention was made of a forge.

Although we have no physical remains of Allen's forge or forges along the Winooski or Shelburne, industrial archeology, the study of physical industrial remains notwithstanding, continues at these important sites. No remains of Allen's forges are ever expected to rise to the surface at either Winooski Falls or Shelburne Falls, because these early sites have most likely been destroyed by later industries that took advantage of the exceptional water power available. Attention is periodically paid to river wash, deposited downstream from the sites, in the hopes of finding a piece of historic slag, or maybe an identifiable piece of forge artifact that could be scientifically analyzed. Deed research is another undertaking that has yet to be pursued to its fullest. Through deed research the location of Ira Allen's forges might someday be pin-pointed.

Another ironworks industry that thrived at the falls was the Edwards and Stevens foundry, which goes back to 1833 when Avery Edwards came to Winooski. Edwards was joined in 1855 by Alonzo Stevens who, upon the death of Edwards' partner, became the new partner. Down through the years, various other partners were taken and the industry thrived. In 1883 it was reported to have been the largest and best-equipped foundry in the entire state. In one 7,000 square-foot building, a giant overhead crane serviced half the floor space, and an internal railway carried huge castings through the shops. But the death of the founders also resulted in the firm's closing, in 1911.

The great Champlain Mill followed at the site in 1912, and the conversion of the mill to a shopping mall in the 1980s along with the associated razing of buildings and paving of the two city blocks north of the mill for parking erased almost all surface evidence of the foundry. Almost all, but not quite. If you know where to look, bits of slag and firebrick can still be found in the weeds at the base of the tall wooden power poles to the east of the main mill complex, seen in the far distance of this photo. And where everyone else sees only trash east of the shopping center, between the backyards of houses along East Allen Street and the river, a sharp-eyed industrial archeologist can still point out small bits of slag and firebrick, today's only surviving evidence of the great ironworks that once operated at Winooski Falls.

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# VERMONT WORKERS VERMONT RESOURCES

Clay, Wood, Metal, Stone



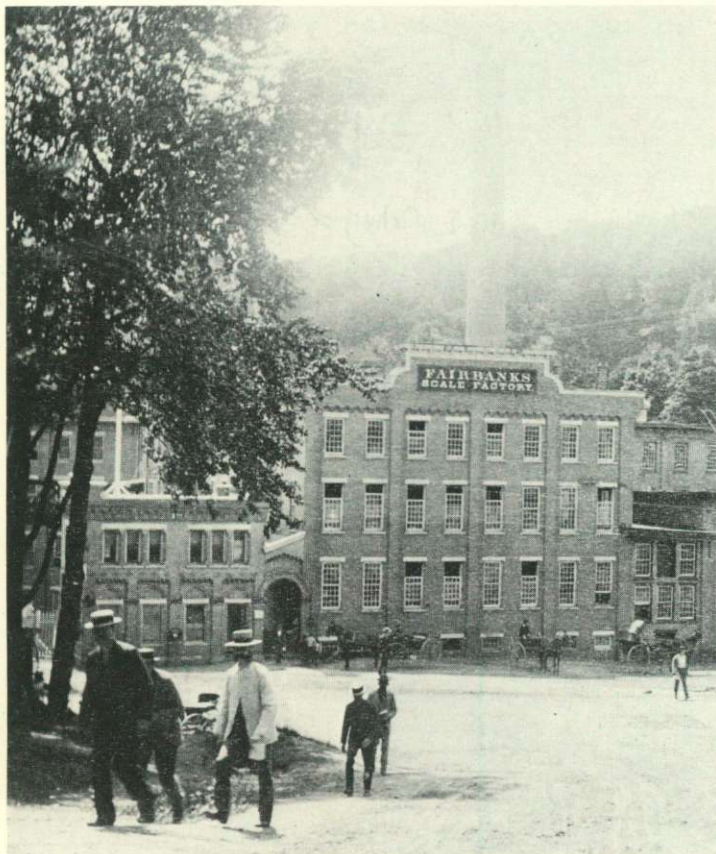
A Bellows Falls area blacksmith pauses in his work to stand in his doorway.  
Courtesy Rockingham Public Library, Bellows Falls.

A traveling exhibition produced by the Brattleboro Museum & Art Center  
Faith Learned Pepe, Guest Curator

**“These people live again in print as intensely as when their images were captured on the old dry plates. . . . I am walking in their alleys, standing in their rooms and sheds and workshops, looking in and out of their windows.”**

Ansel Adams, Photographer

Quoted in Susan Sontag, *On Photography*, 1977.



Noon hour at the Fairbanks Scales Co., c. 1900. Courtesy St. Johnsbury Atheneum.

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This project has been made possible by matching grants from the Vermont Council on the Humanities and Public Issues and the First Vermont Bank & Trust Company.



**“Our generation doesn’t know half the sweat or blood it took to make this country, or this state, or this town, or even this mill.”**

Buck Heath, Sawyer, Hyde Park, Vt. Interview by Mark Pendergast. Special Collections, Bailey/Howe Library, University of Vermont.



A group of workers at the Griffith & McIntire sawmill in Peru, Vermont, c. 1900. Photograph courtesy of Dr. Carl Pfister and the *Shires of Bennington* collection, Bennington Museum.



## Foreword

*Vermont Workers, Vermont Resources* is the first statewide labor history exhibition produced in Vermont. The exhibition and accompanying lecture/discussion series examine the contributions and struggles of workers who made use of the state's abundant natural resources—clay, wood, metal, and stone—from the 18th century through 1950.

Impetus for this project came from the Vermont Labor History Society and its bibliographic project, which has provided valuable information concerning the location of labor history sources within the state. The expertise of three Exhibition Consultants served to facilitate the Exhibition Curator's statewide search for photographs and documents relating to the history of workers in Vermont's extractive industries. Six months of research, which took the Curator to numerous museums, historical societies, libraries, and workers' homes, produced such an abundance of labor history materials that many, unfortunately, could not be included in this exhibition. Supplementary materials have been donated by the Brattleboro Museum & Art Center to the archives of the Vermont Labor History Society in hopes that they may stimulate further research on the topic of work and workers in Vermont.

*Vermont Workers, Vermont Resources* has been made possible through the collaboration and contributions of many organizations and individuals. Produced by the Brattleboro Museum & Art Center in cooperation with the Vermont Labor History Society, the project was funded by matching grants from the First Vermont Bank and Trust Company and the Vermont Council on the Humanities & Public Issues. Twenty-eight cultural institutions and many individuals have contributed information, photographs, and invaluable assistance. The Staff and Board of the Brattleboro Museum & Art Center join Exhibition Curator Faith Learned Pepe in gratefully acknowledging these contributions.

W. Rod Faulds  
Director, Brattleboro Museum & Art Center



**Long before white settlers arrived on the scene, Abenaki Indians devised a method of tapping maples trees to obtain sugar.**

Engraving from *Les Moeurs des Sauvages Ameriquains*. Courtesy Special Collections, Bailey/Howe Library, University of Vermont.

# VERMONT WORKERS, VERMONT RESOURCES

## Clay, Wood, Metal, Stone

### The Agrarian Myth

Vermont's agrarian past has long overshadowed its industrial history. Not long ago the state was famous for having more cows than people. Recently it achieved the distinction of becoming the "most rural" of the 50 states. The word rural," as used by the United States Census, means nothing more nor less than a sparsely settled area. Based on population rather than occupation, the term is misleading. Although tourist bureaus actively promote the agricultural image, farming has been declining in Vermont for the past half century. In 1940 there were about as many Vermonters working in agriculture as in industry. By 1983 a mere 4.7 percent of the state's labor force was employed in farming. Today the vast majority of Vermonters are employed in businesses and industries off the farm.

Nostalgia perpetuates the agrarian myth. Many out-of-staters move to Vermont from a conscious or unconscious longing to escape the complex problems of urban life and to recover the simple earthy values of the past. Once here, they find that—like it or not—Vermonters live in the 20th century. The myth distorts our vision. Wearing blinders, we see a *Vermont Life* image of rolling hills, pristine villages, and woods. We tend to ignore such blotches on the landscape as trailers, fast-food restaurants, shopping centers, and factories.

Nostalgia distorts and idealizes the past, making it difficult to make wise decisions for the future. History, one hopes, attempts to set the record straight. Towards the end of the Depression, John Dos Passos wrote that "a sense of continuity with generations gone before can stretch like a lifeline across the scary present. ...."<sup>1</sup> Vermonters need to examine the past in order to redefine their goals for the future. By attempting to understand our state's working heritage, we may discover "a workable heritage"—lessons from the past that offer guidance for the future.

### Vermont's Early Industrial Period

In 1835 Alexis de Tocqueville observed that "almost all of the farmers in the United States have combined some trade with agriculture."<sup>2</sup> An examination of Vermont's early business gazetteers confirms his observation. In the primarily agricultural economy of early Vermont, farmers often had small farm-based shops where they crafted essential items for farm and home. During the cold winter months a farmer might turn his hand to

blacksmithing, wood turning, or coopering, while within the home his wife and daughters spun and wove cloth for all household needs. During slack seasons, farmers often worked off the farm, in lumbering, or at the local sawmill.

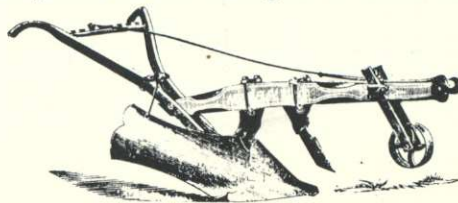
Because cash was scarce and Vermonters resourceful, a full-time farmer with no other trade or occupation was rare. Hand-crafted chairs, barrels, ox yokes, and cloth were as good as money, since they could be bartered with neighbors or traded to peddlers to obtain necessary household goods. Vermont folk-singer Margaret MacArthur sings a song, written in 1787, that enumerates the merchandise bartered by the "ingenious mechanic[s]" of Marlboro. Everything from wooden dippers and noggins to baskets, rakes, and "braided bark mittens" was made locally and could be traded to peddlers in exchange for such items as thimbles, jack knives, and hatchets. The song closes with these hopeful lines:

May manufacturers long abound  
In this mechanical peddling town.  
And may those sons whose sires are dead  
Have as good means to get their bread  
As their fathers have had this many a year.<sup>3</sup>

By the early 19th century Vermont's economy was changing. Home-based artisans were gradually being forced out of business by small mills and factories that sprang up along streams in nearly every Vermont town. As long as these industries remained small, they continued to offer seasonal employment to local farmers. An embargo on the import of foreign goods, before and during the War of 1812, further stimulated Vermont's industrial growth. Although this era of prosperity lasted barely a decade, it marked the beginning of an irreversible trend towards industrialization.

When the embargo was lifted, the state's manufacturing wealth rapidly declined. Factories went out of business, and many Vermonters found themselves out of jobs. Hard times followed. By the 1830s Vermont had used up most of its valuable timber. Farm yields were decreasing as the result of soil exhaus-

CAST IRON SUGAR  
ARCHES.



Woolen Land Plow, and Other  
FLOWS.

→Hubbell Swivel, Land and Hillside Plows,←

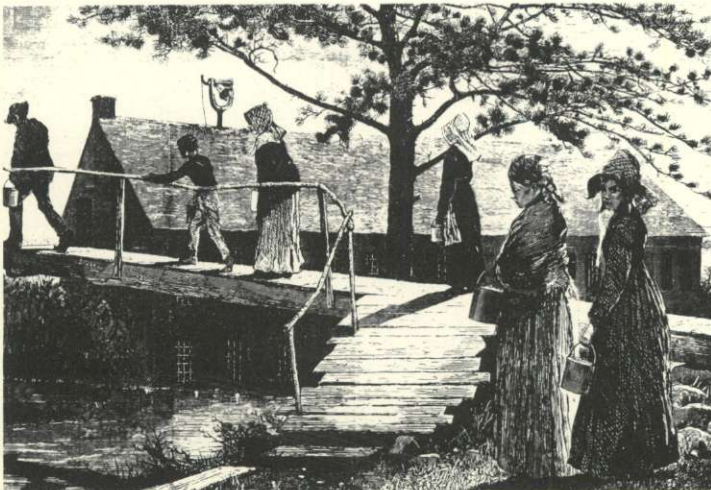


tion, and many young Vermonters decided to head towards more fertile fields in the West. Canals that farmers and manufacturers had hoped would provide a profitable outlet for Vermont products ironically proved more successful in bringing in competitive products from the West. Vermont's economy was further shaken by the Panic of 1837, an economic upheaval that forced many businesses and several banks to close.<sup>4</sup>

The optimism of post-Revolutionary Vermont dwindled and, with it, the hope that daughters and sons might have "as good means to get their bread/ As their fathers have had. . . ."<sup>5</sup> Although farm-based "mechanics" and handicraft artisans continued to think of themselves as "manufacturers" and continued to barter their goods and services for at least another twenty years, the industrial revolution had irreversibly changed the economy. The best plows and farm equipment were factory-manufactured. If a farmer wanted to keep pace with the latest agricultural methods, he needed money to purchase machinery. Wool and towcloth continued to be woven at home, and could still be bartered, but wives and daughters preferred factory-made

## "The Swinging mill bell changed its rate To tolling like the count of fate."

Robert Frost, *A Lone Striker*



Women and children were employed in Vermont's early paper mills. They worked 12 to 14 hours per day for low pay. *The Morning Bell*, by Winslow Homer.

calico prints. Girls who had previously been employed in small Vermont textile and paper mills now went off to work in the factories of Massachusetts and Connecticut, where the pay was higher and the pace of life more exciting than "back on the farm." Sometimes they sent part of their paycheck back home to help supplement the family income. Throughout the 1830s and '40s more and more Vermonters abandoned farming, and either moved away or sought employment off the farm.<sup>6</sup>

The first rumbles of labor unrest came from Woodstock, Burlington, Middlebury, and Calais in 1830, where members of workingmen's societies complained of inequality between "laborers" and "non-laborers." To narrow the widening gap between rich and poor, *The Working-Man's Gazette* demanded equal universal education, abolition of imprisonment for debt, a more equitable tax system, and less expensive legal fees.

Writers of the 1830s and '40s expressed diverse opinions on the merits and liabilities of industrialization. Nathaniel Hawthorne was impressed with the "picturesqueness" of factories located "in the midst of such wild scenery."<sup>8</sup> Transcendentalist Theodore Parker, a onetime patient at Brattleboro's Wesselhoef Watercure, was optimistic that machines would "at last set free a large portion of leisure time. . . ."<sup>9</sup> Socialist John Orvis disagreed. In an 1847 article, "Trip to Vermont," he predicted that the "beautiful pastoral life will give place to oppressive factory life," that the "golden equality which now exists will precipitate into rigorous forms of caste, of capitalist and laborer."<sup>10</sup> In an 1847 letter written from Ferrisburg, Orvis pointed out that social distinctions already existed between native-born Vermonters and their "Irish and Canadian helps."<sup>11</sup> Orestes Brownson, a native of Vermont, was even more pessimistic: "We know of no sadder sight on earth than one of our factory villages presents, when the bell at break of day . . . calls out its hundreds or thousands of operatives."<sup>12</sup>

Few Vermont factories could claim as many as a hundred operatives, and the majority employed fewer than twenty-five. Despite the alarm of a few Boston-based intellectuals, the industrial changes in pre-Civil War Vermont took place gradually. Historian Milton Cantor has drawn a picture of workers in pre-industrial America as sharing "a sense of community and ideology" in common with their employers.<sup>13</sup> In Vermont, patterns of shared community life and informal relations between employers and employees generally persisted well into the 1870s. The Nortons of Bennington, for example, worked alongside their potters



“in the spirit of the ancient guilds.”<sup>14</sup> Relations between paternalistic Redfield Proctor, first president of the Vermont Marble Company, and his employees were reportedly “casual and friendly.”<sup>15</sup> Under such circumstances there were few labor disputes. Many small industries employed skilled artisan-craftsmen or mechanics who hoped eventually to become master artisans or managers of their own factories.

Irregular and undisciplined work patterns plagued cost-conscious manufacturers in the pre-Civil War era. Immigrant Staffordshire potters, for example, “worked hard, but in distinctly preindustrial styles,” alternating “bursts of great activity” with bouts of “debauchery.”<sup>16</sup> Bennington potters drank and socialized with each other on and off the job. One Staffordshire potter, Daniel Greatbach, was famous for “organizing evening rides to a well-known drinking place” near Bennington, “from which most of the potters returned in a hilarious mood.”<sup>17</sup> Temperance pledges signed by some of the Bennington potters indicate that a few, at least, may have made efforts to reform.<sup>18</sup> Greatbach, however, remained a drunkard and eventually died in a Trenton, New Jersey poorhouse.

Drinking was rarely considered a problem in pre-industrial Vermont. The state’s early settlers drank on every possible occasion, from barn raisings to husking bees. In 1821 the builders of Weathersfield meetinghouse presented the town fathers with a bill for “rum, spirits, and small beer.”<sup>19</sup> Such expenses were considered an essential part of building costs. Men set their own irregular labor rhythms and presumably no one looked askance if a builder or craftsman occasionally had to sleep off the results of over-indulgence. Once mechanization took over, irregular labor rhythms had to be regimented to adapt to the rhythm of machines. Tolling factory bells reminded workers that time was money. Because industrial efficiency required sober dependable workers, factory owners were likely to be active in the temperance movement. After 1828, crusaders against “the demon rum” joined forces in over two hundred chapters of the Vermont Temperance Society in an attempt to convince tipplers that sobriety was the most direct path to prosperity and salvation.

### Peddlers and Itinerants

Despite an increased demand for factory-made goods, home-based craftsmen and artisans continued to manufacture and barter their products through most of the 19th century. Vermont’s

peddlers were eager to dispose of their stock in exchange for barter or “truck,” “for the profit was in the bartered goods.”<sup>20</sup> Further research needs to be done on Vermont’s early peddlers, such as “Marlboro’s Merchants,” mentioned in Stephen Greenleaf’s 1787 song. It seems likely that the routes covered by such 18th-century peddlers were relatively short. By the mid-nineteenth century, with improved road conditions, a peddler’s route was often as long as 1,200 miles. The typical 19th-century Vermont peddler was employed by a local tin factory. Before 1850 a peddler’s stock consisted primarily of necessities. Tin pans, milk cans, and kitchen utensils were traded for rags, feathers, hair, fur and old brass—all used in early manufacturing or handicraft work. As industrialization progressed, factory-made articles and non-essential sundries were added to the peddler’s stock. Cotton gingham, combs, spectacles, lace, “bosom pins,” and decorated tinware were a few of the most sought after items.<sup>21</sup>

**“Something of the spirit of the ancient guilds prevailed. . . . During one hundred and one years there was never an industrial dispute of any kind in the Norton Potteries.”**

John Spargo, *The Potters and Potteries of Bennington*, 1926.



This early photograph shows Edward Norton, wearing a silk top hat, surrounded by some of the potters who helped make Bennington stoneware and porcelain famous. Courtesy Elizabeth M. Johnson Collection, Bennington Museum.



Vermont's most famous peddler was Jim Fisk of Brattleboro, who went on to achieve notoriety and wealth by amassing approximately six million dollars from the sale of worthless Erie railroad stock. Fisk worked as a peddler following a short stint with a travelling circus. He successfully applied show business techniques to his peddling endeavor. Painting his wagon with gaudy circus colors and wearing a silk top hat, he hired children to pass out publicity handbills announcing his arrival in a new town.<sup>22</sup>

Jim Fisk undoubtedly contributed to the negative stereotype of the peddler. Other famous Vermont peddlers, like "Honest Wilson" of Barre and "Blind Crompton" of Norton, helped redeem the image.<sup>23</sup> Tin peddling offered the young Vermonter an opportunity for travel and adventure, plus sales experience that could be applied to future commercial endeavors. A peddler's life was not easy. James Guild of Halifax complained that it was difficult for a farm boy to "put on a pedlar's face."<sup>24</sup> In his 1854 diary, peddler William Holbrook of Burlington expressed both enthusiasm and discouragement. He enjoyed visiting some of the

**"My brass kettles leek the worst way . . . and it is hurting the business carrying such kettles about the Country."**

**WILEY BROTHERS, & CO.,**  
MANUFACTURERS AND WHOLESALE DEALERS IN

**Cin, Britannia, Brass, and**  
**GLASS-WARE;**

**Stoves, Dry Goods, and Yankee Notions.**

Wm. L. WILEY, } SAXTONS RIVER, VT. { H. C. WILEY,  
 G. N. WILEY, } { R. F. BAILEY.

ALSO, DEALERS IN ALL KINDS OF PEDLER'S BARTER, VIZ:

Feathers, Pewter, Brass, Copper and Lead, Wool, Sheep's Pelts, Calf Skins and Hides, Rags, Socks and Mittens, Flannel and Frocking, Bees-wax, old Rubber, Long and Stub Hair, Bristles, Fur, &c., &c.

Walter Morse, Saxtons River Peddler, 1839. Letter and advertisement, courtesy Lorraine Moore and the Saxtons River Historical Society.

state's famous industrial sites. After a trip to Bennington, for example, he marvelled that the pottery sheds were, "Truly worth examining—truly a great Curiosity, to behold the genius of Experienced Workmen in forming so rapidly their different shaped Wares with a Lump of Clay. . . ."<sup>25</sup> Most of the time, however, he travelled through the countryside with little recompense for his efforts. After one particularly discouraging day he wrote, "Have not done a cent's worth of business today! Too bad to work so hard over hills and rocks for nothing—Can't help it. So goes the world."<sup>26</sup> Walter Morse, a peddler who worked for the George Perry brass and tin shop in Saxtons River, complained about faulty merchandise: "My Brass kettles leek the worst way," he wrote to his employer, ". . . and it is hurting the business carrying such kettles about the Country."<sup>27</sup>

Copper mining boomed in Vermont between 1850 and 1880. Cornish copper miners, whose skills were highly valued by mine owners, could readily find employment at above-average wages in any mine from Vermont to Virginia. According to historian Collamer Abbott, Cornish copper miners employed in Vermont had transient work patterns. A miner might work "at Pike Hill in Corinth for a time, at Ely [Vershire] a few months or years later, and part of the time at South Strafford."<sup>28</sup> When they tired of Vermont, Cornish copper miners often migrated from one Appalachian copper camp to another. A notable example was Thomas Pollard, superintendent of the Vermont Copper Mining Company's mine from 1854-1863 and 1865-1869. After leaving England, Pollard worked in mines in eight states.<sup>29</sup>

Immigrant Staffordshire potters were similar to Cornish miners in that their skills were highly valued by a developing industry. Daniel Greatbach—descended from a family of famous English potters—worked in Bennington from 1852-58, then moved on to work in Kaolin, South Carolina; Peoria, Illinois; and Trenton, New Jersey.<sup>30</sup>

Much lower on the social scale were tinkers, who traveled about the countryside mending pots, pans, and tools, and migrant factory workers who drifted from one Vermont town to another. Anna May (Cannan) Sevigny, an Irish mill worker from North Hartland, called them "'rounders' . . . young fellows that would come and work, probably a few weeks or few months, and then move on to something else. . . . The only education they had was mill work. They never had enough education to get any further on in life."<sup>31</sup> Economic hard times undoubtedly contributed to these itinerant work patterns.

**“Of course all is total darkness in here, except where the flickering miner’s lamps throw an uncertain light into the gloom around. . . .”**

*Bradford Opinion, Bradford, Vermont, June 21, 1879.*



Miners employed by the Vermont Copper Mining Company in Vershire worked underground by the dim light of small kerosene lamps, c. 1880. Photograph courtesy Wilbur Collection, Bailey/Howe Library, University of Vermont.



### Immigrants and Industrial Labor, 1850-1900

Prior to 1850, native Vermonters comprised the majority of the state's industrial workforce. Towards the mid-19th century, British factory, mill, and mine workers contributed badly-needed industrial skills and expertise to Vermont's new industries. This

**“In 1880 Barre became a mecca for skilled quarriers and sculptors from the stoneworking centers of Europe. . . .”**

Mari Tomasi, “Faces in Granite,” *Vermont Life*, Winter, 1957-1958.



A group of monument-makers at Carnes sheds in East Barre, c. 1894.

group included Cornish copper miners, Scottish and English Scottish stone cutters, Staffordshire potters, and slate quarrymen from North Wales.

Following the Potato Famine of 1846, thousands of Irish citizens emigrated to the United States. Lacking the specialized skills of the earlier group of British immigrants, they were initially forced to accept low-paying jobs. The first wave of Irish immigrants to arrive in the Green Mountains was hired to build the network of railroad tracks that connected Vermont to the rest of New England. Many of these railway workers eventually found jobs at the Vermont Marble Company. West Rutland, where they settled, became known as “Little Ireland.” When Vermont industrialists found that they could save themselves money by hiring the Irish for less than they had formerly paid native workers, anger towards the newcomers often erupted. Undaunted by difficult working conditions and a frequently hostile environment, West Rutland's Irish marble quarriers sang a song in which they proudly declared themselves “free in a land of liberty.”<sup>32</sup>

The next sizeable ethnic group to arrive in Vermont was Italian. The state's rich deposits of granite and marble attracted skilled quarriers and carvers from Northern Italy. Many migrated to the Rutland-Proctor area, but the majority settled in Barre. Between 1880 and 1910, Barre's population grew from 2,700 to 12,832. By 1910 approximately half the town's inhabitants were Italian.

Barre's Italian stoneworkers brought with them a variety of political beliefs. There were “Garibaldini,” “Republicani,” Anarchists and Syndicalists. A large number of the workers considered themselves Socialist, the most popular party in Barre through 1930. Although they were considered dangerously “radical” by conservative Yankees, the majority of Barre's Italian granite workers were primarily concerned with fighting for a decent wage.<sup>33</sup>

Other ethnic groups flocked to Barre to work in the quarries and stonesheds of “The Granite Center of the World.” Skilled Scottish granite workers were later joined by Irishmen, Spaniards, French Canadians, Swedes, Lebanese, and other nationalities. Worker solidarity was strong in Barre. It led to the formation of the Barre branch of the Granite Cutters' National Union in 1886, and to the formation of the Quarry Workers' International Union of North America in 1903. Barre served as national headquarters for this union. By 1900 more than 90% of





the Barre workforce belonged to one of fifteen local unions. In 1889 the Barre Central Labor Union, coordinator of the various union groups, sponsored a "Mass Meeting," featuring American Federation of Labor President Samuel Gompers as speaker. A decade later Emma Goldman spoke at Tomasi Hall. In 1903 Socialist leader Eugene Debs came to Barre to lecture on "Industrial Evolution."<sup>34</sup>

The labor situation in the Rutland-Proctor area was quite different. During the 1860s there had been approximately ten small marble companies operating in Vermont. In 1870 Redfield Proctor succeeded in merging various small marble concerns into the Sutherland Falls Marble Company. Outwardly, at least, the village of Sutherland Falls (later renamed Proctor) presented the facade of being an ideal manufacturing town. Until the 1890s employer-employee relations appeared to be good. In the early years Redfield Proctor often worked alongside his employees in the marble yards. As "friend and benefactor" of his town, Proctor provided his workers with company housing, a company-owned bank and store, and a library.<sup>35</sup>

By the mid-1880s the Vermont Marble Company had become the state's largest corporation. Redfield Proctor, having already served as Governor of Vermont, was appointed United States Secretary of War in 1891. Before departing for Washington, he passed the presidency of the company on to his son, Fletcher Proctor, who continued to expand the corporation.

The first European ethnic group to work in the marble quarries was the Irish, who had already settled in West Rutland by 1870. In 1880 Redfield Proctor visited Carrara, Italy, where he hired eighteen skilled stonecutters. Other skilled Italian craftsmen followed them to Proctor. Between 1886 and 1896 there was a heavy Swedish migration to the area. Two Swedish churches, a Swedish Aid Society, and other Swedish clubs were established in Proctor. The Swedes gained a reputation for being "clannish." When company officials began giving them preferential treatment, "lively altercations" broke out between Irish and Swedish workers.<sup>36</sup>

Ethnic antagonisms divided the labor movement. Between 1886 and 1887, Irish marble workers living in Rutland were successful in voting Knights of Labor into office. (The Knights of Labor, later supplanted by the American Federation of Labor, was the first general federation of unions in the United States.) The Knights combined politics with trade union action, and—like the Workingman's Party of the 1830's—were committed to

**"I always belonged to the union. I believed in the union. It's the principle of the thing, you know."**

Italian Granite Worker, quoted in *Blood of Barre*.

## THE BARRE CENTRAL LABOR UNION.

# Mass \* Meeting!

Monday Eve'g, Dec. 16, 1889.

## PROGRAMME.

OPENING TABLEAU—Representing the long hours system in its effects on humanity.

DUET, . . . Messrs. W. F. Morse and Geo. D. Wheeler.

SONG—"The Oldest Man at Tea," . . . Mr. J. B. Casey.

INTRODUCTORY REMARKS, . . . Chairman E. L. Smith, Esq.

**ADDRESS by Mr. SAMUEL GOMPERS, of N. Y. City**

SONG—"The Turnkey," . . . Mr. T. P. Bryce.

RECITATION—"Labor," . . . Miss Flossie Glynn.

DUET, . . . Mrs. Doran and Mrs. Spencer.

SONG—"Those Girls at School," . . . Mr. Jas. Sievwright.

SONG—"Your Tool-box will be Ruffled by-and-by." . . .  
Mr. Geo. Troup.

TABLEAU—Representing the benefits of shorter hours of Labor.

In 1889, when more than ninety percent of Barre's workforce belonged to one of fifteen local labor unions, American Federation of Labor President Samuel Gompers spoke before a "Mass Meeting." Broadside, Courtesy Special Collections, Bailey/Howe Library, University of Vermont



education, cooperation, honest government, and an equitable tax system.<sup>37</sup> Labor unrest grew during Fletcher Proctor's twenty-two year tenure as president of the corporation. Dissatisfied with piecework rates, approximately twenty percent of the marble workers organized. The 1904 strike was unsuccessful, however, with only seven percent of the workers participating.<sup>38</sup>

In Vermont, as elsewhere in the United States, short periods of prosperity followed by depressions began in the 1870s and continued into the 19th century. The Vermont Copper Mining Company in Ely (Vershire) reached the height of its boom in 1878. At that time 851 employees—mostly Cornish and Irish—

were on its payroll. By 1880 the company was in trouble. Copper prices had dropped, the richness of the copper ore had diminished, and new machines were needed. By June of 1883 the miners were owed several months back pay. Without a union to support their demands, the miners' only hope was to refuse to go back to work until paid. The managers responded by posting a notice stating that unless the miners agreed to work for less the mines would be closed. The men were told that back wages would be paid once the ore already on hand had been smelted.

The workers presented a united front in refusing to accept these conditions. On July 2, they ransacked the company store,

**“We are in a bad box here. . . . The men swear they will burn the village.**

Letter from E. P. Johnson to L. G. Hinckley, Ely, Vermont, July 3, 1883. Vermont Historical Society.



Panoramic view of the copper mining village of Ely (now Vershire) in the 1880s. Collamer Abbott Collection, Bailey/Howe Library, University of Vermont.

THE ONLY  
 EUREKA!  
 UNFADING  
 HUGH G. HUGHES, R. WYNNE ROBERTS,  
 POULTNEY, 18 Little Power,  
 VERMONT. LONDON, ENG.



then marched on to the company president's house shouting, "Bread or blood!" Smith Ely, the retired New Jersey businessman who had been president of the mining operation since 1864, temporarily placated the miners by offering to "give" them the bankrupt mine. The following day the miners ran one of the company's managers out of town. They threatened to burn the village unless they were paid by the evening of July 7. When 200 state militiamen were called in to put down the "riot," the miners surrendered without resistance. Able to collect only twenty percent of their back wages, most moved away and found other jobs. Shortly thereafter the Vermont Copper Mining Company closed down for good.<sup>39</sup>

Other ethnic groups contributed to Vermont's industrial labor force in the latter half of the 19th century. The Welsh brought their skills and cultural traditions with them from Wales to Vermont's slate belt. As the slate industry continued to grow in the western central part of the state, they were joined by Cornish, Irish, Polish and Italian workers. Although most of the quarries in the Poultney-Fairhaven area have now been abandoned, evidence of the slatecutters' work remains. As one Vermonter put it, any house in this area not roofed with slate stands out "like a blackberry in a pan of milk."<sup>40</sup>

French Canadians and Swedes were famous for their skill as loggers and sawyers. Before the invention of the chain saw, logging in Vermont was considered tough work. Up until the late 1890s, all trees were felled with an axe. Then cross-cut saws came in, and were subsequently replaced, around 1915, by one-man bucksaws. Rivermen, who drove the logs downstream, needed agility to jump from log to log, and the strength to break up log jams. Once the logs reached their destination, they were cut into beams, boards, and planks. By 1850, circular saws had replaced the old up-and-down saws at most mills. Improved technology meant increased production. In the 1860s, a sawyer using a circular saw could cut 4,000 feet of boards in an hour. A hundred years later he could cut over three times that amount in the same amount of time.<sup>41</sup>

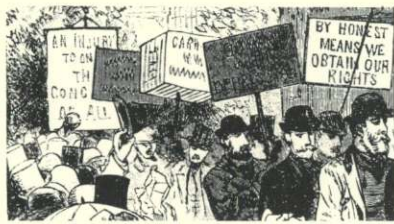
By the early 20th century, Vermont's labor force had become a "melting pot" of many nationalities. Spanish granite workers, Scottish brickmakers, Lithuanian woodworkers, German machinists, and many other nationalities adapted to the often harsh climate of their adopted state, and contributed skills, abilities and customs that have enriched Vermont's working heritage.

**"A lot of effort and pride went into the work, along with just as much pride in doing things in a workmanlike way."**

James Covino, Pawlet Slatemaker, "Slatemaker," *Vermont Life*, Winter, 1972.



Under a bare bulb, with chisel and mallet, a Welsh slatemaker splits the stone into thin pieces. The man seated behind her works at a slate-trimming machine. Photo, c. 1900. Courtesy Welsh Room, Green Mountain College Library, Poultney.



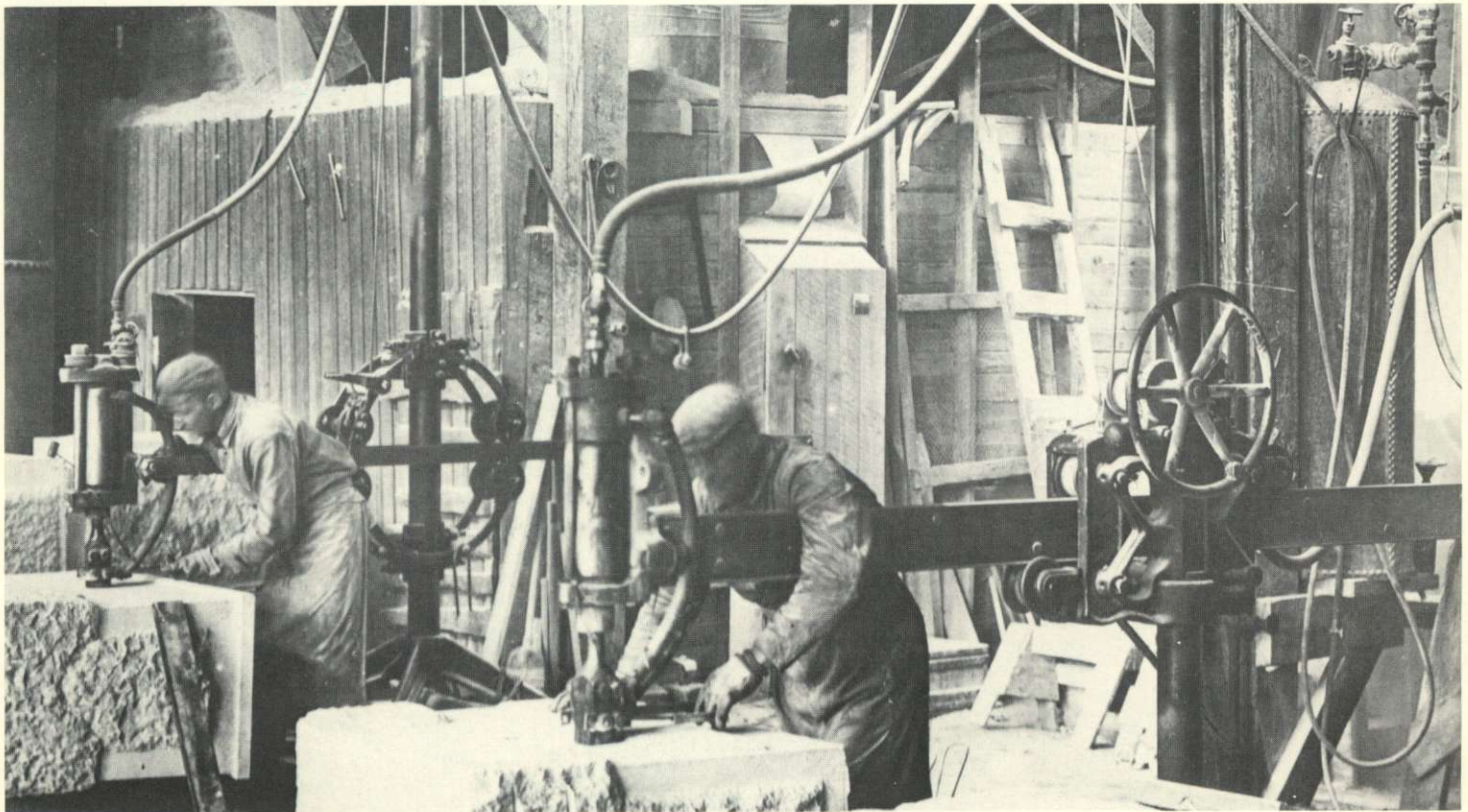
### Labor and Strikes, 1900-1950

Between 1872 and 1913 the manufacturing production of the United States multiplied by six. By 1910 even rural Vermont could boast that almost eleven percent of its population was engaged in manufacturing. In the same year, the state's extractive industries—with the exception of copper mining—appeared to be booming. According to the state's industrial census, Ver-

mont surpassed all other states in the production of marble, granite, and asbestos, and was the nation's second largest producer of slate, talc, and soapstone. At this time approximately 4,200 workers were employed in the state's marble industry, most of whom worked for the Vermont Marble Company. Approximately 6,000 Vermonters quarried, cut, and carved granite. An additional eight to nine hundred worked in the slate industry, and several hundred others were employed in soap-

**“A lot of ‘em died—forty, forty-two . . . right around that age. . . . But now there’s not so many, because they have those suction devices.”**

Barre stonemason's widow, quoted in *Blood of Barre*, produced for NPR's "All Things Considered," September 3, 1979.



Barre stonemasons working without masks. Inhalation of granite dust caused silicosis, a disease that drastically shortened the life span of granite workers. Courtesy Vermont Historical Society.



stone, asbestos, and talc industries. Another 5,700 were engaged in lumber and timber products businesses, plus 1,200 in the manufacture of furniture and wooden refrigerators.<sup>42</sup> Compared to other states, Vermont ranked thirty-sixth in wages paid. Except in Barre, unions had made few gains. Over the next four decades, unionized workers continued to struggle against great odds for better wages and working conditions.

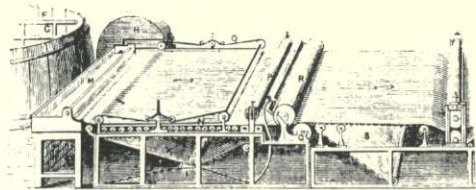
The 1920s proved to be a particularly difficult time for Vermont's unions. The "Red Scare" created a climate of suspicion towards immigrant workers. The majority of Vermonters remained opposed to organized labor. Barre's granite workers suffered a setback in 1922 when previously "closed shop" granite

companies reorganized on the "American" or "open shop" basis. The introduction of pneumatic tools created clouds of fine granite dust. Inhalation of this dust caused silicosis—the granite industry's equivalent to coal's black lung disease. Increasing numbers of granite workers died by middle age. Union agitation in the 1920s and '30s led to the introduction of silica-removing suction machines. This equipment was not in general use until the late 1930s, however.<sup>43</sup>

One of the bitterest strikes of the century was the 1921 strike against the International Paper Company. Bellows Falls, where the strike took place, had been a paper town for over a century. In 1802 its first paper mill employed a half dozen men, plus a



The Bellows Falls paper industry began in 1802. By the late 1800s, when this view was taken, a complex of mills spread out along the falls. International Paper Company came to Bellows Falls in 1898, bringing over twenty years of labor strife to this industrial community. Photograph courtesy Rockingham Public Library, Bellows Falls.



few women who sorted rags and cut paper with “old scythes.” From this primitive beginning, Bellows Falls grew to become a sprawling industrial town, with a complex of mills spread out

**“Not all of Appalachia lies in Western Virginia or Eastern Kentucky. Vermont is Appalachia too....”**

Charles T. Morrissey, *Vermont, A History*, 1981.



This Farm Security Administration photograph, taken in the depths of the Depression, was entitled simply, “Son of Woodchopper.” Courtesy Vermont Historical Society.

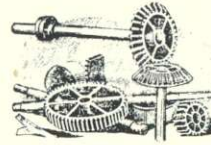
along the falls.

In 1898 International Paper Company came to town, bringing jobs to over 500 native and immigrant workers. More than twenty years of labor strife followed. The biggest and longest strike began in 1921. When the company insisted on an open shop policy and proposed cutting hourly pay rates by thirty percent, 400 men went out on strike. International Paper officials refused to negotiate with union delegates and hired scab labor to replace the striking workers. An article in the local newspaper reported that the “men refuse to go back to work because they are fighting for the underlying principles of organized labor,” and urged them to hold out for “final victory.”<sup>44</sup> Despite local support for the strikers, International Paper won a court injunction “forbidding the union men to assemble, march, picket...”<sup>45</sup> Four years later, when International Paper moved to Canada, the strike remained unsettled.

The 1930s plunged Vermont into the Great Depression. By 1933 the state’s total industrial force had shrunk to a mere 15,000. Hard times set in. There were some who joked that Vermonters were already so used to poverty that they barely noticed the Depression,<sup>46</sup> but unemployed workers and those forced to accept drastic pay cuts experienced severe economic hardship. One Scottish stonecutter who remembered the effect of the Depression years on Barre’s workers put it this way; “Everywhere men out of work. Take away a man’s job and you kill the man. Maybe the dust killed them, but being without work kills them inside—a worse way.”<sup>47</sup>

In 1933 approximately 3,000 granite workers struck against wage reductions that would have reduced pay from nine to six dollars a day. Settlement was reached after a bitter strike, with a limited victory for the union. The granite workers returned to work with a pay cut of a dollar a day. Vermont historian Richard M. Judd believes that this strike “showed that Vermont workingmen could band together for mutual benefit and protection when they were given able and experienced union leadership and community sympathy and support.”<sup>48</sup> He contrasts this strike with the 1935-1936 strike against the Vermont Marble Company, which failed partly because a powerful and paternalistic system of management undermined union efforts to organize the majority of workers.

Following the 1904 strike, the Vermont Marble Company had introduced various paternalistic measures designed to improve labor relations. These included a cooperative company store and



free company hospital. By 1935 most of these paternalistic practices had been dropped. The company coped with the Depression by paying its employees forty to sixty cents per hour. Rent and utilities were deducted from the paychecks of workers living in company housing, leaving next to nothing for food and other necessities. In 1934 many of the workers joined national labor unions. In February of 1935, 500 workers struck. After the company refused to negotiate the wage issue, workers from Danby and Rutland joined the strike. When police armed with machine guns were brought in, ostensibly to subdue clashes between strikers and non-strikers, the strike received national attention. Strike sympathizers were outraged when the company attempted to evict families of striking workers from company housing. "Who are the Proctors of Proctor," demanded a *Nation* magazine article, "who take no reasonable steps to conciliate . . . and now deliver eviction notices to 186 families?"<sup>49</sup> As the strike dragged on, the strikers grew discouraged. When the strike was finally settled on July 26, 1936, the union men had won little more than the right to resume work.<sup>50</sup>

The war economy of the 1940s created a new era of productivity and prosperity. The number of Vermonters employed in jobs off the farm increased from less than 75,000 to nearly 97,000 between 1939 and 1950. In the same period, employment of women jumped ten percent and Vermont's per capita income more than doubled. Unions made noticeable gains, particularly in the machine, tool, and metalworking industries.

The first half of the 19th century had seen major changes in public consciousness. Laws against child labor had been passed, and the eight-hour day instituted. The New Deal brought such far-reaching changes as social security, unemployment benefits, and welfare programs. As late as the 1920s Vermont industrialists clung to such outmoded theories as the "shop-farm" thesis, which held that "the farm inevitably tended to develop the 'natural mechanic' who could readily shift his skill to the shop when it was needed." According to this theory, the mechanic could "move right back to full- or part-time farming" in times of depression.<sup>51</sup> By the 1930s the fallacy of this theory was evident. Farming could no longer "take up the industrial slack."<sup>52</sup> Few factory workers had been raised on farms and even fewer had farms to go home to. The Horatio Alger myth had died with the 19th century, and farm boys no longer regarded a mechanic's training on the factory floor as the best road to success.

## The Present and the Future

*Vermont Workers, Vermont Resources* presents photographs and documents from all over the state in an effort to document the struggles and contributions of workers in Vermont's extractive industries from the late 18th century through 1950. Although the present and future of these industries is beyond the scope of this project, the exhibition raises questions that Vermont audiences may wish to examine. How, for example, can we best utilize the state's natural resources without negatively affecting its ecology? How can the independent Vermont crafts-person become economically self-supporting? Vermont's tradition of independence has often clashed with the ethic of cooperation. Based on the evidence of the past, how can workers best improve the quality of their lives without giving up their liberties?

The fact that every major Vermont industry is now owned by out-of-state firms has created some alarm in recent years. Most recently, the Brattleboro Development Credit Corporation controversy led some Vermonters to conclude that employers were being drawn to the state "with the promise of plentiful cheap labor."<sup>53</sup> Vermont is hardly a "third-world country,"<sup>54</sup> however. Its wages are relatively—not disastrously—low. The average weekly earnings of full-time production workers on manufactur-



The Vermont Marble Company Store. Following the strike of 1904, the store was reorganized on a cooperative basis. Courtesy Vermont Historical Society.

**“Labor in Vermont should, of course, have as favorable working conditions as in the states about us. We should not become a haven for industries employing underpaid and underprivileged labor.”**

Former Governor of Vermont, George D. Aiken, 1937.

ers payrolls is \$323 (as compared with \$389 in Connecticut, and \$299 in Alabama). As of last year, Vermont's per capita income ranked thirty-sixth in the United States.

Unemployment that plagues some of the state's major industries promises to increase, however. Projected employment figures for 1990 show a 19.9 percent decrease in mining and quarrying, and a 14.1 percent decrease in stone, clay and glass production. Although electrical and electronic machine industries are expected to increase their workforce by 50.2 percent,<sup>55</sup> we need to be concerned with the future of displaced workers, and to be assured that the new industries will provide a living wage. Perhaps, therefore, the most important question is: How can Vermont's economy be managed to lessen unemployment and create more opportunities without destroying the quality of the environment?

The photographs that appear in this exhibition speak for themselves. They need no further description or explanation. The faces of the workers portrayed here testify to the fact that life in Vermont has often been a struggle against poverty and a harsh environment—“a grueling ordeal of trying to scratch a living between a rock and a very hard place.”<sup>56</sup> Many gains have been made in the past fifty years. The future is up to us.

**Faith Learned Pepe**  
Exhibition Curator

**“The permanent employment of a class of more or less skilled workmen in the manufacture of woodenware, furniture, vehicles, tools, etc., is a decided benefit to any community.”**

*Industrial Vermont*, Montpelier, 1914.



Miles Hovey, a St. Johnsbury cooper, stands in front of what may have been the biggest barrel in the state. 1909 census figures showed that 687 persons were employed in cooperage and wooden goods businesses. Photograph courtesy Fairbanks Museum, St. Johnsbury.



# Notes

1. John Dos Passos, *The Ground We Stand On* (New York, 1941), p. 3.
2. Alexis de Tocqueville, *Democracy in America* (Garden City, New York, 1969), p. 554. The first edition of *Democracy in America* was published in France in 1835.
3. Stephen Greenleaf wrote the lyrics of "Marlboro Merchants" in Brattleboro in 1797. The song has been recorded on a Folkways record, *Folk Songs of Vermont, Sung by Margaret MacArthur*, FH 5314, 1963.
4. John J. Duffy, H. Nicholas Muller, III, *An Anxious Democracy, Aspects of the 1830s* (Westport, Connecticut, 1982), pp. 21, 22, 53n.
5. Stephen Greenleaf, "Marlboro Merchants" (Brattleboro, Vermont, 1797.) Manuscript in the collection of Margaret MacArthur, Marlboro, Vermont.
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