



Chapter 6

Study of Charcoal Mounds and Kilns

Study Methodology

Initial charcoal making in Vermont coincided with initial iron making. As settlements grew, foundries and blacksmith shops added an additional demand for charcoal. Whether smithies or foundries operated first can be argued either way (in early times there was often little difference between the two), but charcoal was a requirement for both. Each made its own charcoal, usually locally, until land clearing pushed the forest line back into the mountains.

The problem encountered while researching for ironworks production records was reflected in the search for records of charcoal production: little has survived. Exceptions are some one- or two-page accounts in library archives and the usually vague references in published histories. Much of what has been learned about the charcoal industry in Vermont came from finding the charcoal-making site, estimating its period of operation, and trying to guess where all the charcoal went. Estimating the period of operation, when no documentation was otherwise available, was done after field inspection of the physical remains, not always an accurate method. What was discovered about charcoal making in places outside Vermont was usually applied to the data found in Vermont. As realistic an idea as possible was thus strived for with regard to what was going on in this state.

No doubt there is much "undiscovered" archival information in ledgers stacked on shelves of libraries and bookstores, as well as passing references in personal and business letters saved in family Bibles or note boxes. Likewise, many hundreds of remains and ruins are still hidden in the mountains, waiting to be found and assimilated into the growing bank of knowledge, for reevaluation and reinterpretation of the Vermont charcoal-making experience.

The search for brick-type charcoal kilns was similar, yet somewhat different, than the search for furnaces and forges. Charcoal kilns were not always built near streams and rivers because waterpower was not required in the kiln operation. But the kilns were usually built near sawmills, and these mills did have a need for water. By the period of the major charcoal industry in Vermont (1860–1900), steam-powered sawmills had arrived. And although steam sawmills continued to operate near streams, water now was required only to replace that lost by the boiler in the form of steam. It was a small amount compared to the amount of water previously required to power a large waterwheel or turbine-powered sawmill.

Mounds and kilns were built as close as possible to the source of their wood supply. Rather than build kilns at the foot of the mountain, near flat roads and local transportation, it was determined early on that hauling heavy logs to the kilns should be minimized and effort concentrated on carting the lighter-weight charcoal. Thus, most charcoal mounds and kilns are found well up the higher elevations, near barely visible roads. Hauling tons of iron reinforcement bands, doors, covers, and other

hardware in addition to thousands of bricks up steep mountain roads in the days of non-mechanized transportation must have been a sight. It brings to mind a vivid definition of the term "labor-intensive."

Brick-type kilns in Vermont were each made from 33,000 to 40,000 bricks, depending on various design features. Bricks, therefore, are obviously one of the things to look out for when in the field searching for charcoal kilns. Most of the kiln's bricks tend to remain where they have been since collapse of the kiln structure, except for those moved through flood and ice action or bulldozing as part of nearby trail or road maintenance. A number of kilns were built of stone, and probably because stone is everywhere available in Vermont, stone-built kilns are less vandalized than brick ones. And not all charcoal kilns in Vermont were round or conical. Four ruins found at two sites in Chittenden were rectangular.

Most kiln sites have long since become buried under heavy brush and tall grass. Some kiln ruins are so leveled that the sites can be walked through without being seen. At Ten Kilns Meadow in Mount Tabor, we discovered one morning that we had pitched our tent the day before in thick grass directly on top of the leveled five-kiln site that we were going to spend the day in search of. We had slept all night inside one of the ruins.

If a stream is nearby, a close inspection of the streambed and shore may reveal pieces of brick that worked their way downhill or were thrown into it. If you are in the vicinity of a suspected charcoal kiln site and there are pieces of red brick in the stream or along the trail, keep a sharp eye out for the kiln ruin. Since objects wash downhill with time, search directly uphill from the exact point of the find, regardless of the direction from which the area was approached.

Another clue in the search for a charcoal site is charcoal itself. In the process of discharging the kilns and loading and driving the charcoal wagons, much spillage occurred. The closer to the kiln, therefore, the darker the soil. But black soil can also be caused by things such as rotting vegetation. Charcoal does not significantly disintegrate over centuries, otherwise the process of carbon dating prehistoric sites would today be impossible. But charcoal can be made by other ways than a prehistoric cooking fire or a charcoal kiln. Finding a badly burned tree stump beneath some charcoal could indicate evidence of a forest fire. Nails and domestic debris mixed with charcoal could mark the site of a house or barn fire. Camp fires usually leave charcoal. The presence of charcoal, therefore, does not always indicate a charcoal mound or kiln site. Check the soil for actual bits of charcoal; they can be as small as grains of sand. Having accumulated through dozens of years of kiln operation and being light in weight, much charcoal has washed downhill from the kiln sites in the past century over the ground, along hiking trails, and onto roads.

The third clue to consider is the terrain. Kilns were usually constructed into 15- to 20-foot-high embankments. A single-

kiln site may have a single concave depression cut into the adjacent low hill; an eight-kiln site may have eight such concave depressions. These concave cuts into embankments were sometimes reinforced with 3- to 5-foot-high stone walls at their highest point, where the kiln was built farthest into the embankment. While the kiln was standing, the distance between the concave wall and the kiln wall was 3 to 4 feet, enough space to allow a kiln tender to walk behind the kiln to maintain vent hole operations or repair the walls. The concave stone-lined embankment is a positive indication of the kiln site.

The hint of an old road might be found leading uphill to the kiln site. Another road might lead around the hill to the top of the embankment. Here, above the kiln, was a wood ramp that allowed access to the charging hole in the roof of the kiln. But some kilns might have been built so far from the embankment that no concave depressions or wall exist. This is true of the site of eight kilns at Old Job in Mount Tabor. And at Ten Kilns Meadow, not far away, the embankments have flat walls instead of concave for each individual kiln. Although the process of making charcoal was generally consistent from operation to operation, field evidence shows that certain specific techniques varied.

A kiln ruin itself can be characterized by anything from visible brick or stone walls 3 to 6 feet high, complete with vent holes, large kiln-girdling iron hoops, and mounds of charcoal, to no walls but a low 30-foot-diameter circular mound of thousands of bricks, or only a circle of very black ground. The nearer the kiln ruin is to public visibility and motorized access, usually the less the remains to view. Also, the nearer to road and heavily used trails, the more evidence of discarded trash (beverage cans, bottles, automobile parts) in the sites and potholing in the walls. Over the years, many kiln sites have become the source of brick for chimneys and backyard fireplaces of nearby residents. Since most kiln sites in the Green Mountain National Forest are on U.S. Forest Service property, they are actively protected by forest rangers. Violators are arrested and prosecuted. But this does not entirely prevent sites from being vandalized for brick and scrap iron. The dollars made stealing and destroying a site do not come close to compensation for the loss of a historic and educational resource to the general public.

Aerial photo inspection for charcoal kiln sites was tried at the Vermont Mapping Program, Waterbury, with no success. Photos inspected were 1:1250 to 1:5000 scale orthophotos of Vermont taken at about 30,000 feet (1 inch of orthophoto equals about 416 feet on the ground). After spending hours squinting through a magnifying glass at dozens of these 3-foot-square black-and-white photos and then weekends field-checking some possibilities, the only sites confirmed were those already known. Visible kiln ruins measure less than $\frac{1}{16}$ th of an inch in diameter in the orthophoto and look like tiny moon craters. It was one thing to know where they exist and find them in the orthophoto; it was another to determine whether that tiny round feature was in fact a kiln ruin or an empty swimming pool (Stamford), a circular depression (Tinmouth), a frozen puddle (Winhall), a silo foundation (Panton), or just a pile of manure (Shoreham).

Searching for the earth-covered mound was much more difficult because no bricks or iron hardware were used in its

construction and, therefore, no hardware remained to guide the way. Neither were they usually built into an embankment as were the structure-type charcoal kilns. And having predated the brick-type kiln, nature has had much more time to hide the evidence with more trees to disguise the site, more leaves and soil to cover the burned pitch floor, and more rains and spring thaws to reconfigure the site and scatter charcoal more thinly over a wider area. One clue to a mound site was the presence of lush vegetation. An 1851 agricultural journal noted that the effect of charcoal dust resulted in the "quickenings" of vegetation: "The spots where charcoal pits were burned 20, and some say even 30 years since, still produce better corn, wheat, oats, vegetables or grass, than the adjoining lands" (Carey 1851:516). The preference of white birch and yellow birch for charcoal-making (and lime-burning) areas was noticed while doing fieldwork in the Green Mountains.

Ground preparation for mound construction in areas liberally covered with surface stones required clearing the area first. The result was a denser distribution of stones in the circular area immediately outside the perimeter of the mound site than the area farther out. A shallow, circular ditch, called the gutter, was dug around the perimeter but outside the mound floor. The gutter and area of stones were good indications of a mound site. Charcoal was made inside the gutter area and this floor was saturated as deep as a foot with charcoal and pitch. Charcoal spilled during unloading was also found outside the perimeter. The gutter was sometimes more obvious in spring and fall, when leaves had blown into it and became trapped in the depression.

The lack of hardware and bricks made finding a charcoal mound site in a random search almost impossible. Since charcoal mounds took longer to prepare, charge, burn, and discharge than the later brick-constructed kilns, the need for a sawmill to cut wood and keep up with the charring had not yet become a necessity. Wood was cut by axe, so the mounds could be remote from a waterpowered sawmill. The site of a number of charcoal mounds was discovered by U.S. Forest Service personnel high up the slopes of Worth Mountain in Hancock and Bloodroot Mountain in Chittenden, far from any obvious sawmill site. They were found during routine surveys of forest tracts for logging potential. Sharp-eyed forest rangers first noticed cellar holes at both sites with scattered bits of charcoal nearby. The remains of six charcoal mounds were found in the immediate vicinity at Worth Mountain and 20 more at Bloodroot Mountain.

Historical references to charcoal making in the early 19th century are skimpy. Statements that charcoal was made "in the nearby woods" define neither distance nor direction. What might have been nearby woods for the forge at Swanton in 1810 could today be someone's backyard in the village. Conversations with older, longtime residents within a 10-mile radius of an ironworks produced some results. One farmer remembered plowing soil that was especially black just after a light spring rain. Another remembered a family tradition of ancestors making charcoal while clearing farmland.

Ironworks in the 1790–1800 period consumed less charcoal than those of the 1870–1880 period. As such, charcoal was made from forests that were closer to the ironworks in 1800 than in 1870. By the 1880s, the brick-type kilns were located well up in the mountains, attacking last stands of hardwood

forest. As the charcoal industry swept across the valleys and up into the mountains, the clearings behind became farmland in many places. The passage of time, therefore, became the measure of distance; the terrain defined the direction.

Results of the Charcoal Kiln Study

Fifty-seven charcoal-making sites were reported to the State Archeologist during the 1983–1991 period of the overall statewide IA study of charcoal kiln ruins and mound remains and are now part of the Vermont Archeological Inventory. Forty-two sites contained 130 kiln ruins: 108 were made of brick, 9 of stone, 12 of a combination of stone and brick, and 1 of concrete block, while fourteen of the sites contained remains of 51 mounds (one site contained both a brick-type and a mound-type). Analysis of the kiln ruins determined that 122 were round, 5 were rectangular, 1 was conical, and 2 remain unidentified. All except two sites are within the new (1991) proclamation boundary of the Green Mountain National Forest; a majority are on federal property. Two other sites have been reported to the State Archeologist in the Field Site (FS) category. There was inconclusive or no positive surface evidence at these sites, but subsurface material of 4 charcoal kilns and an undetermined number of mound remains might exist. Archival and field work continues at 12 more sites in the work-in-progress (CK) category. The total number of charcoal-making sites studied is 71 at this writing.

Brick-type ruins found in Vermont were generally laid up in a modified common bond with headers laid every third course. The walls were laid three bricks thick on the stretcher courses and 1½ bricks thick for the header courses, generally measuring 17½ inches thick. The walls and their reinforcing hardware supported the vaulting brick roof and compensated for the kiln's heating and cooling cycles, which caused the structure to expand and contract slightly with each of these cycles.

In addition to the heavy cast-iron bands that reinforced the brick walls, other hardware found included large front charging doors made of sheets of about ½-inch-thick iron bolted together to form one unit measuring up to 6 feet high by 7 feet wide, iron wall binders with end plates, heavy iron lintels which provided a platform across which the iron doors slid, and cast-iron vent hole linings. Inspection of the few pieces of hardware that have survived scrap drives indicated little similarity between hardware designs and dimensions, suggesting that hardware for the kilns was made "on order" at a foundry. Some front charging doors had U-shaped iron handles bolted or welded to them; other handles were a U-shaped section of long iron bars that reinforced the entire height of the door.

Variability in design of hardware for charcoal kilns was also obvious in the configurations of the round covers that closed the top charging holes by laying flat on the round holes in the tops of the kilns. These 6- to 7-foot-diameter by ½-inch-thick iron covers displayed varieties of vent holes. Most covers had nearly brick-size holes cut lengthwise into the cover so the holes could be closed simply by bricks laying flat on them. One cover found at Peru had holes with small, sliding iron doors that could be opened and closed to control the draft allowed to enter the kiln through these top vents. A few covers had no holes at all. Cover handles varied from pairs of U-shaped

iron units bolted or welded to the covers to U-shaped sections of long iron bars that reinforced the entire diameters of the covers (similar to variations of handle designs on the large iron doors). Probably because of their round, flat shape, these covers escaped detection of scavengers. Except for their uniquely shaped iron doors, no hardware was found associated with stone-type kiln ruins because their beehive design created a much more stable structure.

All kiln ruins, whether brick- or stone-type, contained vent holes that conveniently allowed the lengthwise insertion of an ordinary red brick to close the hole. Stone-type kiln ruins used a pair of bricks set lengthwise side by side with another lengthwise brick-size space between them. These were laid over and under with large flat stones. Variations in vent holes were found at two sites of brick-type kiln ruins that had cast-iron vent linings. At one stone-type kiln site, vent hole linings were found made of an unidentified tile material.

Kiln ruins and mound remains were found at elevations from 660 to 2,400 feet above sea level. Vermont's lowest elevation is 95 feet, at Lake Champlain; the highest point is Mount Mansfield at 4,393 feet. The average state elevation is approximately 1,000 feet. In the area of the most kiln finds, 12 mountains rise to between 3,000 and 3,800 feet. Brick-type kiln ruins averaged 1,815 feet in elevation at a range of 660 to 2,360 feet. The largest concentration of 59 brick-type ruins was found between 1,500 and 2,000 feet. Stone-type ruins averaged 2,057 feet in elevation with a range of 1,560 to 2,400 feet, somewhat higher in elevation than the brick types, but significantly compacted in a tighter range. The largest concentration of 10 stone-type ruins was found between the 2,000- and 2,500-foot level. Mound-type remains were found at the lower average of 1,336 feet in elevation, at a range of 700 to 2,360 feet; there was no significant concentration at any elevation. Most kiln ruins were found in proximity to good-flowing streams.

Table 6-1 lists the charcoal kiln and mound sites that have been researched alphabetically by county and numerically within county by site identification number. Sites unrecorded (CK numbers) are those where ruins or remains either have not been found or inconclusive evidence exists to positively identify the kiln or mound site. The table lists the sites' identification numbers; their principal names; number of units (mounds and/or kilns) per site; whether the site is mound-type, made of stone, brick, or a stone-and-brick combination; and if in the Green Mountain National Forest.

Following table 6-1 are three sections that divide the state into the northern, central, and southern districts, as described in the Introduction in the front of this book (see "Presentation of the Study"). In these sections, the history of the charcoal-making site and a description of whatever physical remains exist are presented. Table 6-2 at the end of the chapter summarizes the results of the charcoal kiln study.

Presentation of sites within each section is by county, and within each county, sites are presented either in site number sequence or grouped to reflect a geographic proximity. Grouping does not reflect any commonality that might have existed when the kilns were in operation, but aids in describing them. Accompanying maps provide a geographic sense of the physical disposition of the sites and ruins, without compromising the

Table 6-1. Charcoal Kiln and Mound Sites

Site No.	Principal Name	Units per Site	Type	Green Mountain National Forest
<u>Addison County</u>				
AD-16	Huntley Island	1	Mound	No
AD-314	Dragon Brook	4	Brick	Yes
AD-315	Widow's Trail	3	Brick	Yes
AD-338	Billings	3	Brick/Stone?	Yes
AD-341	Keewaydin Camps	4	Mound	Yes
AD-348	Adler Brook-East	3	Mound	Yes
AD-351	Adler Brook-West	1	Mound	Yes
AD-356	Sandusky	?	Brick	No
AD-395	Worth Mountain	6	Mound	Yes
AD-405	Leicester Hollow	3	Mound	Yes
AD-467	Barker Brook	1?	Stone?	Yes
AD-FS85	Mt. Fuller	?	Mound?	No
AD-CK01	Cobble Mountain	?	Brick?	Yes
<u>Bennington County</u>				
BE-37	Red Cabin	5	Brick	Yes
BE-39	Mad Tom Lower	3	Brick	Yes
BE-40	Mad Tom Middle	1	Brick	Yes
BE-41	Mad Tom Upper	5	Brick	Yes
BE-42	Winhall River	4	Brick	Yes
BE-43	Bromley Brook	4	Brick	Yes
BE-44	Bourn Brook	8	Brick	Yes
BE-45	Bickford Hollow	3	Brick	Yes
BE-46	East Fork	3	Brick	Yes
BE-47	West Fork	5	Brick	Yes
BE-50	Heartwellville-Stone	1	Brick/Stone?	Yes
BE-51	Heartwellville-Brick	2	Brick	Yes
BE-52	Heartwellville-Conical	1	Brick	Yes
BE-53	Cotykilns	4	Stone	Yes
BE-54	Dutch Hill	2	Brick/Stone?	Yes
BE-55	Gully Brook	2	Stone	Yes
BE-56	North Glastenbury	1	Mound	Yes
		1	Brick	Yes
BE-57	Hager Hill	2?	Brick	Yes
BE-58	Bacon Hollow	1	Mound	Yes
BE-61	East Mountain	1	Mound	Yes
BE-62	Burden Lots-South	2	Brick/Stone	Yes
BE-63	Burden Lots-North	2	Brick/Stone	Yes
BE-105	Kennedy	1	Brick/Stone?	Yes
BE-106	Cardinal Brook	4	Brick	Yes
BE-107	Crazy John Stream	3	Brick/Stone	Yes
BE-108	Thompson Farm	2	Mound	Yes
BE-134	Old Route 30	1	Brick	Yes
BE-142	Sylvan Ridge	2	Stone	Yes
BE-143	Southwest Corner	1	Brick	Yes
BE-153	Harmon Hill	6	Mound	Yes
BE-190	Northwest Corner	1	Brick	Yes
BE-191	Benedict Hollow	2?	Brick	Yes
BE-CK01	Snow Valley	?	Brick?	Yes

Table 6-1. Charcoal Kiln and Mound Sites (Cont.)

Site No.	Principal Name	Units per Site	Type	Green Mountain National Forest
<u>Bennington County (Cont.)</u>				
BE-CK02	Barnumville	2?	Brick	Yes
BE-CK03	Root & Jones Chemical Company	?	?	Yes
BE-CK04	Red Mountain	?	Brick?	Yes
BE-CK05	Sandgate Charcoal Plant	?	?	Yes
BE-CK06	Fayville	?	Brick	Yes
<u>Caledonia County</u>				
CA-CK01	I. N. Hall & Son	?	Brick?	No
<u>Chittenden County</u>				
CH-1	Pine Island	2	Mound	No
<u>Orange County</u>				
OR-CK01	West Braintree	?	Brick?	No
OR-CK02	Ely	?	Brick?	No
<u>Rutland County</u>				
RU-78	Old Job	8	Brick	Yes
RU-79	Ten Kilns Brook	10	Brick	Yes
RU-84	Black Branch	9	Brick	Yes
RU-85	Four Kilns	4	Brick	Yes
RU-86	Greeley's Mills	?	Mound?	Yes
RU-108	Kiln #36	1	Brick	Yes
RU-155	Kiln Brook	5	Brick	Yes
RU-156	Lampman	1	Stone*	Yes
RU-160	Danby Mountain Road	4	Brick	No
RU-188	Beaudry Brook	20	Mound	Yes
RU-190	Furnace Brook	3	Brick*	Yes
RU-FS19	Danby Station	4	Brick	Yes
RU-CK01	Dugout Road	1?	Stone?	Yes
<u>Washington County</u>				
WA-21	Stevenson Brook	?	Mound?	No
<u>Windham County</u>				
WD-66	Harold Field	1	Concrete block*	Yes
<u>Windsor County</u>				
WN-CK01	Salt Ash Mountain	?	Not known	No

*Rectangular kiln

exact location of the site.

For the purpose of this study, remains and ruins are used to differentiate between non-structural and structural surface evidence. Remains include charcoal mounds that have no structural elements and are relatively flat, circular areas with other mound-type characteristics (see chapter 5, "Pits and Mounds"). Ruins

include charcoal kilns that are standing or partially standing structures, and might also include visible sections of brick and/or stone walls (see chapter 5, "Charcoal Kilns"). Remains are therefore associated with surface evidence of charcoal mounds while ruins are associated with surface evidence of charcoal kilns (whether of stone, brick, or combination). A

200 Years of Soot and Sweat

charcoal-making site can be an area with or without any visible surface mound or kiln features.

WARNING to Hikers and Explorers: Although appearing sturdy, kiln ruins are in fact fragile. Climbing about them loosens stones, weakens walls, and significantly contributes to their progressive deterioration.

The Northern District

CALEDONIA COUNTY

Charcoal was being made in Barnet, Groton, and Walden in the 1880s, possibly to support foundries in St. Johnsbury and along the Connecticut and Passumpsic rivers. Charcoal customers in St. Johnsbury were the Paddock Iron Works and Fairbanks Scales. The scale company annually consumed 100,000 bushels of charcoal in addition to 300 tons of anthracite for working its 2,500 tons of pig iron, 200 tons of bar iron, 38 tons of steel, and 20 tons of copper (Hemenway vol. 1 1867:407; Child 1887:315). Some of the county charcoal burners were Felix Many of East Barnet, John B. Rogers and Frank M. Shaw of Walden who made charcoal about a mile north of Joes Pond, and Thomas B. Hall and Albert S. Clark of Groton (Child 1887:267).

CA-CK01 I. N. Hall & Son (Groton): In 1876 Thomas B. Hall started a charcoal business with his father under the name I. N. Hall & Son (Child 1887:196). Albert S. Clark of Groton also made charcoal for the company. Location of the kilns is not recorded but is suspected to be near Route 302 near West Groton, possibly toward the abandoned railroad grade. No attempt has been made to physically locate the site.

CHITTENDEN COUNTY

CH-1 Pine Island (Colchester): Chittenden County may contain one of Vermont's earliest charcoal mounds remains at Pine Island just north of Burlington. Excavations here in the late 1960s by the Vermont Archaeological Society suggest this is the site where Ira Allen contracted Aaron Brownell about 1794 to make charcoal for the former's forge and anchor shop at Colchester (chapter 4, CH-IW01). The two low mound remains were about 33 feet in diameter with shallow ditches circling them. The center of one mound revealed a center hole, which at one time held the center vertical chimney log. Also excavated was a large charred log. The mounds were covered from inches to a foot with layers of charcoal (Haviland 1973:1-4).

WASHINGTON COUNTY

WA-21 Stevenson Brook Charcoal Mounds (Waterbury): The Waterbury Last Block Company operated a sawmill a few miles east of the county line in the Little River State Park during the 19th century. According to a state park map, charcoal mounds were associated with the mill. The map shows "Coal Pit Bottoms" and "Former Charcoal Pit Burnings" about two miles up Stevenson Brook and west of the main park area near the dam (William Gove letter to author, Nov. 1, 1985).

The trail to the site, which parallels the brook on the west, was hiked in 1986 with no remains of charcoal or mounds being found. Evidence of the sawmill are cellar holes, a large rusty boiler, saw blades, part of a turbine, and unidentified

castings. A wood marker "8" on a nearby tree correlates this area to the charcoal and sawmill site number on the map. Sides of hills in the area of the mill as well as potential areas on the way back down the trail were inspected with no evidence of charcoal found.

The Central District

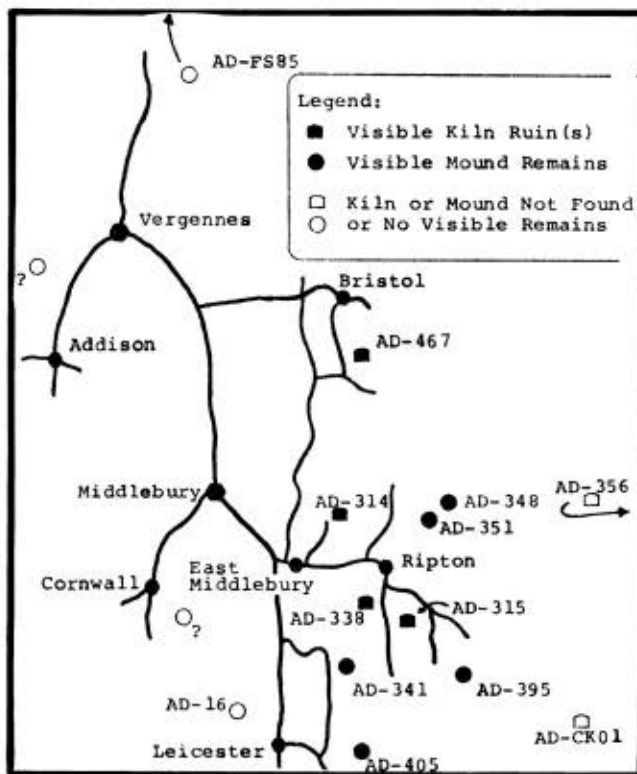
ADDISON COUNTY

Early-19th-century charcoal making in Addison County generally centered around the needs of the Monkton Iron Company at Vergennes. Initial needs were satisfied from charcoal made in fields in the immediate area. One of these areas was Mount Fuller, in western Monkton, where charcoal making is an oral tradition. As charcoal needs grew, it forced expansion into tracts of land in the nearby towns of Panton and Addison (Smith 1886:666). In time, the Monkton Iron Company looked across the lake for better prices (Seaburg and Paterson 1971:207). So great was the company's expected need for huge amounts of charcoal that when it advertised in January 1808 that it would purchase charcoal in large quantities, it also built large barns for storing it. Eventually, there were 15 charcoal storage barns in Vergennes (Smith 1886:665).

Several mounds, oval to round, were found many years ago at Cornwall with ditches around them. One contained charcoal 18 inches deep (Haviland 1973:1). The remains of another was found about the same time in the middle of a swamp in northern Leicester. Charcoal was made up the North Branch of the Middlebury River in Ripton from 1859 to the 1880s in kilns owned by Williams & Nichols of the East Middlebury Forge, which made 9,000 bushels of charcoal a month (Smith 1886:593-594). Using Hodge's June 9, 1849 figures (see chapter 5, "Charcoal Kilns"), this calculates to the destruction of about 90 acres of forestland per year, from just this one moderate-size operation alone. According to research done by State Archaeologist Giovanna Peebles, a possible charcoal mound site "on the highway from Bristol to Burlington, in Edgewood" was found to be in Bristol and Burlington, Connecticut, and not Vermont as the reference alludes (Haviland 1973:1).

Sites of charcoal mounds have been found by Green Mountain National Forest personnel in Hancock and Ripton, north of Ripton village near Huntley Brook, and on the western slopes of Worth Mountain near the Goshen line. Dick DeBonis of the U.S. Forest Service generously spent his weekends guiding us to many northern district sites. Two miles northwest near Dragon Brook are ruins of four brick-type kilns. The ruins of three more lie well hidden atop a mountain a mile southeast of Ripton village. Ruins also lie alongside Forest Road 32 just south of Route 125. At East Granville, kilns at the now-abandoned village of Sandusky made coke from coal that was mined nearby before the 1860s. The remains of mound sites were recently located on the east side of Lake Dunmore, and also a few miles southeast, in Leicester Hollow.

Northern Addison County Charcoal Sites: Because of the number of forges and furnaces that operated in northern Addison County in the early 1800s, significantly more charcoal-making sites existed than have been found in the field or in the archives. Ironworks along the Little Otter, for example, must have made large amounts of charcoal in the surrounding area, which was



6-1. Addison County charcoal-making sites.

forested at the time. Crop and pastureland that replaced the harvested forests erased the surface evidences of these charcoal-making sites. The upper Lewis Creek area east of Route 116 might be another undiscovered charcoal-making area.

AD-467 Barker Brook Charcoal Kiln (Bristol): There are a number of published references to a charcoal kiln along the west side of South Mountain, about two miles south of Bristol village: "Midway between the Money Diggings and Rattlesnake Den, at the foot of South Mountain, lies the ruins of the Barker Charcoal Kiln, so-named from the small stream of that name, on which it was situated. . . . The Barker kiln was more extensive than the usual type being a stone enclosure, laid up with mortar, about 10 feet high and 20 feet square. Openings the size of bricks were made on all four sides for drafts and bricks kept on hand to fill these openings when it was necessary to close the drafts. The south side of this kiln is still in almost perfect condition" (Harvey and Kellogg 1941:94-95).

The west slope of South Mountain has been inspected many times since 1986, and the "money diggings" and "rattlesnake den" have been found based on information provided by John Peters of New Haven, and Bob Carpenter and Ted Lylis of Bristol. John Peters, who knew where the diggings were, felt that the stream shown on the USGS topographical map was Barker Brook (John Peters letter to author, Sept. 6, 1986). If this is true, a stone ruin found about a 10-minute hike uphill from Town Road 23 at the double culvert (top of the rise) could possibly be the so-called Barker charcoal kiln. An arrow drawn

on a copy of the topographical map by Bob Carpenter, pointing out the trail to the kiln, further reinforces this.

The ruin looks more like the stone foundation of a cellar hole for a small building than a charcoal kiln, and no charcoal was found inside the hole or associated with the foundation. Charcoal was found, however, in a depression about 50 feet north and along the steep trail leading up to this flat area. Whether the Barker charcoal kiln ruin has been found or not remains a mystery.

AD-FS85 Mt. Fuller Charcoal Area (Monkton): North Ferrisburgh resident Fred Royce remembers visiting Mt. Fuller many years ago, taken there on walks by his mother and seeing areas of black soil and charcoal (Fred Royce to author, April 20, 1985). The charcoal area is up Jackey Lane near the south end of the mountain, just north of the Collins Cemetery. Inspection of the USGS map shows a somewhat level area about a half-mile up the south side of Mt. Fuller from the jeep trail, which could be the charcoal area.

An attempt was made in 1986 to inspect the charcoal area, but a barking reception from free-running dogs of all sizes and persuasions (plus my own barking dog in the pickup) and no response from a nearby house to my beeping discouraged further exploration.

The proximity of Mt. Fuller to ironworks that are documented to have operated within a few miles at a number of places along the Little Otter Creek in Ferrisburgh and New Haven, and the Otter Creek at Vergennes, give credence to charcoal being made here at an early time.

Ripton Area Charcoal Sites: Charcoal operations in the Ripton area most likely were connected with the forges at Middlebury village, and later at East Middlebury. Mound remains up the side of Worth Mountain show how deeply the forests were penetrated and exploited in early times. Local tradition indicates that the road between Ripton and Lincoln, which has not been fully inspected as part of this study, was an area of early charcoal making.

AD-314 Dragon Brook Charcoal Kilns (Ripton): This four-kiln site was initially found with the assistance of Dick DeBonis (U.S. Forest Service) in 1982 and revisited alone in 1985 to inspect results of logging operations nearby. The ruins are about two miles up Dragon Brook from the North Branch of the Middlebury River, near the end of a logging road and about 200 to 300 feet east of the brook.

Nothing historical is known about the kilns, but their proximity to the East Middlebury ironworks makes them candidates for providing charcoal to these works. Some interesting cast-iron vent liners were found here, seen at only one other charcoal kiln site (AD-315) in Vermont.

AD-315 Widow's Trail Charcoal Kilns (Ripton): Ruins of three brick-type charcoal kilns were found in 1982, with guidance to the site by Dick DeBonis (U.S. Forest Service), about 1,700 feet up an unnamed mountain a few miles southeast of Ripton village. The ruins are at the top of a cross-country trail named Widow's Trail, in a wet, swampy bog. Two ruins lie together; the other is about 50 to 60 feet to the east. Interesting hardware was also found here, similar to that at the Dragon Brook ruins (AD-314). DeBonis said he believed these kilns were operated by Parsons Billings. Nothing further is known about this site.

AD-338 Billings Charcoal Kilns (Ripton): The remains of one of the Parsons Billings charcoal kilns indicated on the 1871 Beers map of Ripton were found in 1984, just off the west side of Forest Road 32. The map shows what appear to be three kilns southeast of Ripton village, identified "coal kilns." Nearby is the residence of "P. Billings." A business notice on the map identifies him as a "Farmer and Manufr of Clapboards, Shingles, and Charcoal, and Dealer in Coarse Lumber." A number of other buildings plus a clapboard and shingle mill are also identified along this stretch of the South Branch on the map.

The ruins are about 100 feet west of the road through some thick berry bushes, about 750 feet south of the upper bridge over the South Branch. One ruin is a semicircular stone wall built into a partially caved-in embankment. Pieces of red brick and charcoal are within the ruin. A large mound of stones lies south of the ruin; there is no known connection with the kiln ruin. The other two kiln ruins might lie north of the located ruin, but poor visibility due to density and height of the thorny berry bushes in the vicinity made complete inspection impossible.

AD-348 and AD-351 Adler Brook Charcoal Mounds (Ripton): Sites of three, possibly more, mound-type remains were found in 1985 along the sides of a trail a mile south of Adler Brook. Dick DeBonis (U.S. Forest Service) led the way to the vicinity of the mound remains (AD-348). He had discovered them as part of a survey of the trail, which might be used by logging operations later in the year. The trail skirts the south side of an unnamed mountain (elevation 1,645 feet) just south-east of the juncture of the North Branch and Adler Brook.

Charcoal-making activities here might have been those of Parsons Billings, who operated a sawmill about one mile north-west of the charcoal area and was a dealer in charcoal (Beers *Addison* 1871:36). Some cellar holes and charcoal-bearing depressions were found in the vicinity, possibly indicating charcoal storage sheds.

The site of a single mound-type remain was found on the return hike down the trail from inspecting the previous kiln ruins (AD-351). It is along the same trail, uphill from the outside corner where the trail turned sharply south on its way back to the highway. A pile of small stones attracted an uphill inspection; some charcoal indications in the vicinity of the stones encouraged a broadened inspection (reason for the pile of stones is unknown). In the process the mound remain was found.

AD-395 Worth Mountain Charcoal Mounds (Goshen/Hancock): Sites of six mound-type remains were found up the west slope of Worth Mountain in 1980 by U.S. Forest Service personnel as part of a cultural resource reconnaissance survey. The remains range from 34 to 39 feet in diameter, lying in no definite pattern. Associated with the remains is a nearby cellar hole, which probably housed the collier. Because the site is some distance from any recognizable landmark, it is not certain if the site is in Goshen or Hancock.

Granville Area Charcoal Sites: Discovering that charcoal was made in this area was surprising until proximity to the railroad that ran through the valley was apparent. The railroad placed these charcoal kilns within an hour's haul to foundries at Randolph and points south, and Montpelier and points north. The "coal mine" at Sandusky (East Granville) sounds exciting and some day might be "rediscovered."

AD-356 Sandusky Charcoal/Coke Area (Granville): You would not know it today when you drive by, but at one time, Sandusky, Vermont was a bustling industrial community. The 1871 Beers map of Granville shows 15 structures including two "coal kilns," a "coal and acid house," a railroad depot, the property of Webb, Chaffee, Cummings & Company, and a sawmill:

There used to be a village called Sandusky just out of what is now East Granville village in the extreme north-eastern corner of town. About 1850, a good vein of coal was discovered there. A mine was opened, kilns were built for burning coke, and a village made it profitable to ship both coal and coke. In 1857 the post office of Sandusky was opened, and for a decade the community flourished. Vermont's Sandusky unquestionably took its name from Sandusky, Ohio, where the name derives from the Iroquois and means "source of pure water." Many young Vermonters had gone west earlier in the 19th Century, and in 1868, Hemenway's *Gazetteer* reprinted several letters from that period that had been written from Sandusky, Ohio, to the folks back home in Vermont. Soon after the Civil War, the coal vein petered out, and the village went out of existence. Today only a few foundations and the abandoned coal mine mark the location of Sandusky in Granville (Swift 1977:41)

The area of the "coal kilns" was inspected in 1985, along the Third Branch of the White River, a few hundred feet east off Route 12A. The site is in a small patch of dense brush, next to the stream. Surface scratching revealed rusted cans, old shoes, sheet metal, nails, broken glass bottles, and some cream-ware. Testing in spots inside and outside the wooded area unearthed pieces of usual-looking charcoal, nothing at all like coke. No kiln-type brick or charcoal kiln artifact was found.

Inspection of the stream revealed the wood remains of a bridge that carried a spur track from the main line on the east side of the stream to the west side, just as indicated in the Beers map. The map also shows a road crossing to the east side, where the depot stood, but no evidence of either road or bridge could be found. Inspection of the stream for 100 feet upstream and downstream yielded various pieces of rusted iron castings and rod, most apparently connected with the railroad. Some pieces of red brick were found, although none appeared burnt as would charcoal kiln bricks. Railroad tracks lie just a few feet from the east side of the stream, and pieces of ties, spikes, etc., lie along the embankment on that side. Today's tracks, however, might not be where tracks are shown in the 1871 Beers map. If coke was in fact made here, it might have been the only coke made in Vermont.

Between the highway and the falls is the remains of a dam, possibly that of the sawmill. Just upstream, a 5-foot-square thick iron sheet that looks like a door of a charcoal kiln (coke kiln?) was found. A wide inspection around and above the falls area failed to reveal any kiln evidence. More "coal kilns" are shown on the Beers map about three miles south in Braintree (see OR-CK01).

AD-CK01 Cobble Mountain Charcoal Kilns (Hancock): Charcoal kilns were supposed to have operated somewhere up the west slope of Cobble Mountain but a search through the

area in 1989 resulted in no kiln finds. According to verbal directions by Dick DeBonis (U.S. Forest Service), the subject area is west of Route 100 and "a bit south" of the Route 125 intersection. The section of the mountain inspected yielded some old cellar holes many hundreds of feet up the steep slope and some suspicious black dirt, but no positive charcoal finds. We might not have been "a bit south" enough (see also chapter 8, AD-LK02).

Salisbury Area Charcoal Sites: The most interesting mound finds in the county were those made on tiny Huntley Island in the middle of Salisbury Swamp, in the midst of cabins and a rifle range at Keewaydin Camps, and up Leicester Hollow one hot, muggy day amid clouds of mosquitos. The hike up the trail through the hollow is a must for anyone who wants to see a real piece of Vermont wilderness. That pioneers could have eked out a living in this narrow gorge by farming and charcoal making reflects on the character of the people who settled the land.

AD-16 Huntley Island Charcoal Mound (Leicester): Huntley Island is a slight rise in Salisbury Swamp, one of a group of swamps extending from Middlebury on the north to Sudbury and Brandon on the south. The island is small and during spring floods it probably disappears. It is located in northwest Leicester and borders on the south side of Leicester Creek about a mile before it flows into Otter Creek.

The site was inspected in 1978 by archeologists William Bayreuther, Cindy Cook, Frank L. Cowan, and James B. Petersen of the University of Vermont while canoeing the river. The charcoal remains were described as being a 4- to 6-inch-high 20-foot-diameter mound with a 1- to 2-foot wide rise at its outside edge, resembling a low-profile donut on a level tree-covered area. How and why charcoal was made on an island in the middle of a swamp is unknown unless the area was sufficiently tree-covered and dry at one time to make the effort worthwhile.

AD-341 Keewaydin Camps Charcoal Mounds (Salisbury): Surface remains of four mound-types were recorded in 1985 on the grounds of Keewaydin Camps, about 100 yards from the northeast corner of Lake Dunmore. The site was found through information provided by Polly Darnell of the Sheldon Museum Library, Middlebury.

Israel Davey (of the Fair Haven Iron Works and eventual owner of the Middlebury Iron Works) purchased the former forge (1849) of A. B. Huntley, and "bought a portion of mountain land, across from Keewaydin Camps, where wood was burned to make charcoal for his furnace [forge]. That area is still known by some as Coal Kiln Flats" (Petersen 1976:25). The "across from Keewaydin Camps" had me searching the west side of Lake Dunmore until Polly directed me to the east side.

The remains are on a relatively flat area east and uphill of Route 53, near the end of a trail that joins the highway at the abandoned red schoolhouse. Some of the kiln remains are integrated into camp structures. The remains are characterized by 40-foot-diameter circles of stone plus the round "gutter" at the outside edge. Some remains are more obvious than others. Since three of the remains are grouped relatively close together, with the fourth somewhat isolated, one or more kiln remains might have existed in the area between at an earlier time. There

are many more remains uphill from these (Barry Schultz King to author, May 26, 1989).

AD-405 Leicester Hollow Charcoal Mounds (Leicester): Hiking up Leicester Hollow during bug season must be experienced to be appreciated. A search for a reported rectangular charcoal kiln was undertaken in the hollow the first June weekend of 1986. To make conditions worse, it was a very muggy day and sprinkled on and off just enough to increase the discomfort. As it turned out, the rectangular-shaped kiln was not found, but remains of three mound-types were.

The hollow is a seven-mile-long north-south ravine that is drained by Leicester Hollow Brook. Silver Lake, elevation 1,250 feet and headwaters of the brook, is at the northern end. At the southern end the brook joins Neshobe River. The sides of the hollow are generally steep and rocky, yet the hollow was not only settled from about 1820 to 1900, but industry of sorts was carried on here (Peleszak 1984:6, 11).

The valley floor widens a bit at "the Greenings," halfway up the hollow, where three mound-type remains were found. A cellar hole and some fruit trees indicate where the widow Glynn lived. Charcoal might have been used by a forge that operated in Goshen at an early date; the mounds were most likely connected with blast furnaces in Forest Dale and Brandon village. The remains are 30 to 100 feet east of and parallel to the trail. They are 30 feet in diameter and cut somewhat half-moon-style into the rising embankment.

About 500 feet north of the cellar hole on the same side of the trail is supposed to be remains of the rectangular charcoal kiln. It is "bermed up and the ground surface inside is covered with charcoal" (Billee Hoornbeek letter to the author, March 2, 1986). Inspection of the area turned up nothing. (Iron was also discovered in the hollow in 1815 but it is unknown where or if the ore was exploited.)

ORANGE COUNTY

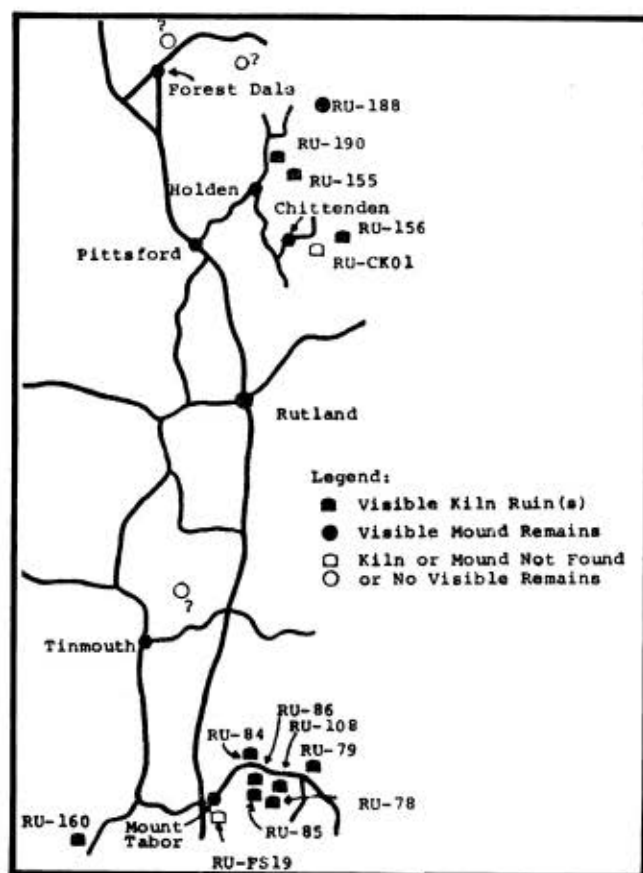
OR-CK01 West Braintree Coal Kilns (Braintree): The 1871 Beers map of Braintree indicates an "Acid Ho. & Coal Kilns" in northwest Braintree, at the junction of the White River Third Branch and Brackett Brook. Webb, Chaffee, Cummings & Company might have had something to do with this operation since that name is indicated a bit upstream along the brook, and is also associated with "coal kilns" in Sandusky (AD-356).

Inspection of the area in 1985 resulted in finding no charcoal or anything associated with coal kilns.

OR-CK02 Ely Charcoal Kilns (Fairlee): Charcoal kilns operated in the village of Ely in the vicinity of what is now a lumberyard along the Connecticut River (Collamer Abbott to author, May 19, 1990). These kilns made charcoal for the copper furnaces at Vershire. No attempt has been made to inspect the site.

RUTLAND COUNTY

A variety of coal then called brown coal was mined at Brandon and used to drive steam engines associated with providing blast to the furnace at Forest Dale. Not hard coal, it was more of an intermediate between peat and bituminous, known as lignite, and was not an uncommon occurrence in New England. The lignite vein was a half-mile south of the Forest Dale Cemetery



6-2. Rutland County charcoal-making sites.

off Route 73, descending obliquely, 20 feet wide by 14 feet thick, to as deep as 90 feet (Thompson 1842:50). As recently as 1911, many hundred tons of it were mined during a coal shortage (Brandon 1961:58).

Some charcoal might have been made right at the Forest Dale ironworks site. Six 4- to 5-foot-high and 85- to 14-foot-long (bottom to top) terraced stone walls just west of the furnace mark where the hillside was reinforced to prevent crumbling into a possible charcoal-making area below. Much charcoal was found on the ground in front of these walls during the three-day cooperative recording project in May 1989 by the Vermont Division for Historic Preservation, the Northern New England Chapter-SIA, and the Vermont Archaeological Society.

Charcoal for Conant's furnace at Brandon village came from a settlement called New Philadelphia, about five miles to the southeast. Here, a community of charcoal burners lived, making charcoal by the old mound method and socializing little with the outside world. Many communities made up chiefly of charcoal burners in New York and New England shared the custom of keeping to themselves (see Blanchard 1960:1-22, about Dudleytown, Connecticut, a fascinating story of an isolated charcoal-making community). The town of Philadelphia was absorbed into Goshen and Chittenden in 1814 and 1816, respectively, but the cellar holes of the community still remain. Prices of

charcoal recorded at Forest Dale were "\$3.00 in cash, \$3.50 in trade, for a bushel of charcoal." Receipts read "cole" for charcoal. Some charcoal was made in an area near the Brandon-Goshen line called "the basin"—a natural hollow into which Basin Brook flows (Brandon 1961:45, 48). During logging operations in this vicinity in 1991, much charcoal was reported churned to the surface due to the skidding of logs (Henry Paynter to author, June 8, 1991). Charcoal was also made on the slopes of Miller Hill in Sudbury (Mary Kennedy to author, April 13, 1986).

Local tradition in Tinnmouth is that charcoal was made up and down the Channel for furnaces operating in the vicinity during the early 1800s. No wonder then, when Nelson Jaquay plowed the large field behind his house, a number of black, charcoal-bearing patches were exposed in various parts of the fields, formerly well hidden beneath sod and tall grass. How many more fields in the valley are withholding secrets?

In parts of Pittsfield and Chittenden, the Tweed River Iron Company (successor to the Pittsfield Iron and Steel Company) operated an extensive mining and charcoal-making business in the 1880s to support a bloomery forge in Hartford, Connecticut. Ore and charcoal were shipped from the mountains by wagons to Bethel, then by rail to Hartford (Smith and Rann 1886:551-552).

The 1854 map of Rutland County indicates "coal kilns" in Chittenden, east of the old mountain road from East Pittsford to Chittenden village. Farther east near Lefferts Pond are the partially standing remains of a rectangular-shaped charcoal kiln. The ruins of five brick-type kilns were also found up Kiln Brook in Chittenden; nearby along Furnace Brook are ruins of three brick-type separate-bay kilns.

Charcoal kilns operated near the West Castleton-Fair Haven town line in the late 1860s (Beers *Rutland* 1869:18). Kilns might also have been located about a mile northwest of Beaver Pond at Proctor, atop a high bluff. There were also charcoal kilns along the slopes of Dorset Mountain in southern Danby (Crosby et al. 1976:7). Mountain areas behind Ruth Foy's property and also on the east slope of the mountain above the quarry might yet reveal some charcoal kiln surprises.

Chittenden Area Charcoal Sites: Charcoal making in the uplands of Chittenden provided fuel for ironworks at Holden in earlier days, and at Pittsford in later days. Remains of mound-type operations can be found almost at will up any small valley in the upper Furnace Brook area. One of the most remarkable finds was that of three brick-type rectangular kilns, only a stone's throw from River Road. Discoveries such as this show that much more is waiting to be found in that area, and also along the ridge farther to the south (as shown by the charcoal that George Butts digs up in his garden).

RU-188 Beaudry Brook Charcoal Mounds (Chittenden): Sites of 20 charcoal mounds about 2,000 feet up the west slope of Bloodroot Mountain in the town of Chittenden were inspected in 1988. Information leading to recording this site was provided in late 1987 by U.S. Forest Service archeologists Billee Hoornbeek and David Lacy. Although Billee reported finding "a field of kilns" in the vicinity of a cellar hole, the majority of the finds we made were well outside the immediate area of the cellar hole. We did notice much surface disturbance in this area, as if made by tree-throws, which more and more started

looking like what Billee might have been describing as kiln sites.

Billee said that the kilns were small, disturbed, and possibly used once. I feel that a mound-type charcoal kiln might be small and disturbed, but considering all the work that goes into site preparation (stump and rock removal, leveling, rain gutter around base), no mound site would be used just once. And why up to 30 of these "one-time" kilns in such close proximity?

The period of making charcoal in this area is unknown, but charcoal made here probably supported blast furnace, forge, or foundry operations in Pittsford (see chapter 4: Keith-Granger blast furnaces 1791–1880s, RU-57, five miles south along Furnace Brook; and the ca. -1820 Cooley and Gibbs furnace/foundry, RU-153, about six miles downstream). The late Patrick E. Mooney recollected the hillsides above Pittsford aglow at night from the charcoal kilns (McWhorter Oct. 2, 1953:68). Note that Kiln Brook, site of brick-type charcoal kilns (RU-155) is about two miles south of the Beaudry Brook kilns. It is generally felt that brick/stone-type charcoal kilns began to replace mound-type kilns during the Civil War period. But some mound operations might have continued into the 1870s and 1880s. There is a local tradition in Monterey, Massachusetts of mound-type charcoal kilns operating into the early 1900s (Richmond Furnace, near Pittsfield, operated to 1923).

The mound remains were generally found within 100 feet either side of a trail; most within 50 feet. The trails are narrow and probably contemporary with the charcoal mounds. Bits of charcoal can be found almost anywhere in the trail beds, probably having spilled from charcoal wagons. Some remains are better defined than others. Identification of a potential mound remain was made by locating an approximately 25- to 30-foot-diameter oval, flat area, free of large stones, and circled by a relatively higher concentration of stones (probably increased by stones thrown or removed from the kiln area proper). Some hillside remains were dug slightly into the uphill side with the downhill side built up. On these, much charcoal could be found eroding out of the built-up circular embankment. Some remains on level ground were slightly built up. Each site was tested with a trowel in at least two places to determine whether the soil was naturally black or contained bits of charcoal. Charcoal found without associated kiln surface features was determined to be spillage or the remains of charcoal piles.

RU-190 Furnace Brook Rectangular Charcoal Kilns (Chittenden): Collapsed remains of a multi-bay charcoal-making site were found in 1988. Discovery was made while driving along River Road on the way to Steam Mill Brook, and stopping to inspect some "foundation walls."

The site is located about 150 feet up a side road that runs northeast off the south side of River Road, about 1½ miles north of Holden and 600 feet north of the concrete bridge over Kiln Brook. The site is bordered on three sides by a wall of heavy stone, 8 feet at highest (north corner), the open end facing southwest (downhill). It contains three charcoal kiln ruins, each made of brick. The westernmost ruin is about 14 feet wide by 56 feet long; the middle ruin is 12 feet wide and about the same length; the easternmost ruin is about 10 feet wide and 50 feet long. The ruins lie parallel to each other about 15 feet apart. The area was heavily covered with leaves and branches in November, and with the bricks so randomly dis-

tributed in the direct kiln vicinity, it was difficult to determine exactly where kiln wall foundations lay underneath it all. Two pieces of hardware were found in the site.

In his paper on the manufacture of charcoal in kilns, Thomas Egleston dimensioned two types of rectangular kilns in New England:

	Type A	Type B
Length	50	40
Width	12	15
Height	12	15
Capacity in cords	55	70

Egleston described a number of construction techniques, none specific to New England (or Vermont) kilns (Egleston May 1879:378-386). Since finding the Furnace Brook rectangular separate-bay kilns is thus far a unique discovery for Vermont, the site warrants close study and attention to historic preservation.

RU-155 Kiln Brook Charcoal Kilns (Chittenden): Five kiln ruins were found up Kiln Brook in 1986 per directions given by Harley Smith of Proctor. He had not been to the site in 60 years but his directions were right on the money. The ruins are about a one-mile hike up Kiln Brook, which is a tributary of Furnace Brook. They lie in a line, parallel to and about 250 feet back from the north shore of the brook. Here the little valley widens, resulting in a sort of flat-bottom basin with little tributaries entering from the north. A snowmobile trail marked VAST (Vermont Association of Snow Travelers) enters this valley from the south, crosses Kiln Brook over a plank and log bridge, curves north across a tributary on a shorter bridge, and passes directly between the ruins and the brook. The five ruins are set back into a low embankment, the top of which would have been level with the tops of the kilns when standing. Stone walls (foundations?) lie about 100 feet behind the ruins.

A kiln door was found that looked much like that of a conical kiln after it was cleaned of leaves and dirt. In a 1953 interview by the *Rutland Herald*, then 86-year-old Patrick Mooney described working at the Pittsford furnace when he was age 15. He said that the charcoal came from five kilns, which took 90 cords at a time to charge (McWhorter Oct. 2, 1953:68). This calculates to about 18 cords per kiln, low for the usual 25 to 40 cords per kiln for the time. But if these were conical kilns the low cordwood figure would be more in line with charcoal kiln practice. Reinspection of the ruin foundations in 1987 did not, however, reveal conical walls.

RU-156 Lampman Rectangular Charcoal Kiln (Chittenden): The stone-type ruin of a rectangular charcoal kiln was found in 1986 on the property of Ken Smith, about a mile southeast of Lefferts Pond (about three miles east of Chittenden village). Directions were given by some residents of Dugout Road while I was involved in trying to find another kiln site in the vicinity.

Child's gazetteer indicates that Benjamin N. Lampman was a manufacturer of charcoal (Child 1881:310). Local historian Bert Muzzy confirmed that the ruin is on property once owned by Lampman.

The most striking feature of this ruin is its rectangular shape:

16 feet wide by 37 feet long. It is made of stone with walls generally 4 to 6 feet high; one corner is about 10 feet high. Walls are about 2 feet thick, with signs of mortaring.

Vent holes suggest the use of bricks for draft control. The inside walls are black and hard; black pitch is accumulated at the vent holes. All collapsed stone appears to have fallen into the kiln; none of the floor is visible due to the amount of stone piled inside of the ruin.

Charging and discharging seem to have been carried out at one end of the kiln, suggested by what appears to be an opening at the back (uphill) end. Some bits of charcoal were found on the ground outside this opening. A large flat sill stone makes up the base of this opening, suggesting a ramp from it to the slightly elevated ground adjacent. At this end of the ruin, a 2-foot-wide ditch runs the width and a few feet around each corner of the base of the walls, probably to keep rain runoff from leaking through the base and into the kiln floor.

There is no indication of how the kiln was roofed. The walls are vertical with no visible reinforcement to support a peak- or arch-type roof. The roof might have been large, flat, cast-iron or steel sheets, maybe removable to facilitate additional loading and unloading access. A section of railroad track sticking up through the stone wall breakdown outside the front (downhill) end of the ruin further suggests how a flat roof might have been supported. Or the kiln could have operated with no roof (open top), the cordwood covered with wet leaves and earth, much the same as in mound-type kilns.

In his report on rectangular kilns, Egleston described kilns made of brick with arch roofs. The rectangular kiln was reinforced by wood beams mounted vertically along the outside walls. Cast-iron rods bolted at the tops and bottoms of opposite beams ran widthwise through the inside of the kiln. Although this technique could have been used at this site there is neither evidence of any wood beams having stood outside the walls nor rods seen in the remains. Additionally, there does not appear to be enough collapsed stone inside the ruin to have been used for an arch roof (assuming all the collapsed stonework still remains).

RU-CK01 Dugout Road Charcoal Kiln (Chittenden): A charcoal kiln site (and possibly ruin) exists somewhere east of Dugout Road, about a mile southeast of Chittenden village, but a search of the area in 1987 failed to locate it. It is indicated as "coal kiln" on the 1854 Rutland County map. A road was recently cut through the area of interest and might possibly have destroyed any existing ruin, although much charcoal and/or black soil would usually have remained. A field site sketch map of RU-FS117 (not included in this study), which is in the vicinity of Dugout Road, shows a 20-foot-diameter feature that might be the kiln remain. Both 1854 county map and the RU-FS117 sketch map indications are quite vague, however, and the ruin might yet be waiting to be found.

Silas L. Griffith, Vermont's Charcoal Baron: One of the most concentrated areas of charcoal making in Vermont, on the scale of an industrial operation, was at Mount Tabor during the 1870–1900 period. Silas L. Griffith, resident of the bordering town of Danby and a descendant of one of the town's earliest settlers, acquired a significant interest in logging and lumbering mills in the Danby/Mount Tabor/Dorset area. Born at Danby on June 27, 1837, the son of David Griffith, he

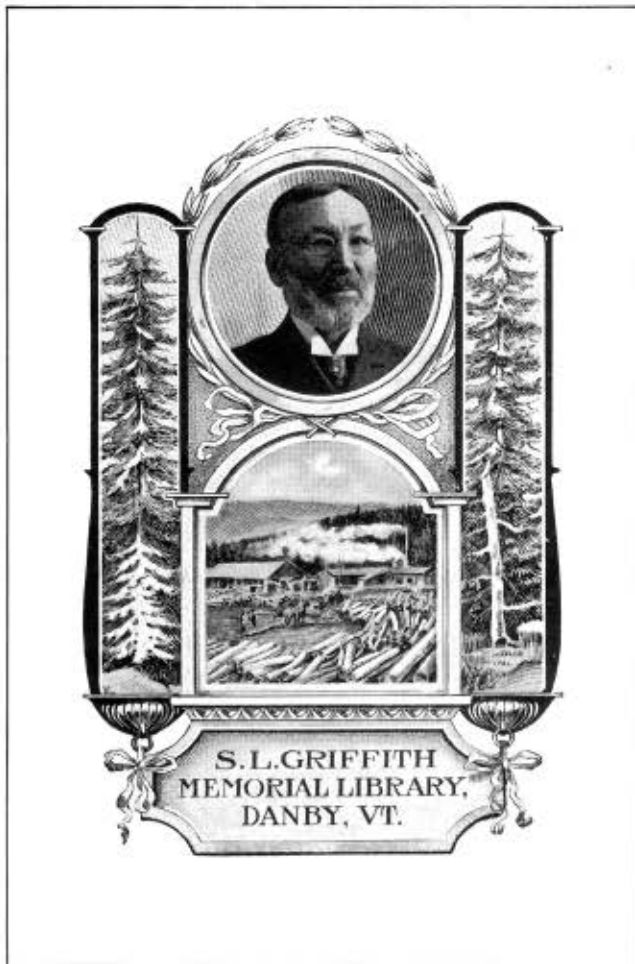
attended the district school until about age 16, then became a clerk in the general store of Lapham & Bruce (Silas L. Griffith biography is generally from Benton 1917:215–218 unless otherwise noted). Two years later he became clerk at the P. D. Ames store in East Dorset and the following year he attended Kimball Union Academy at Meriden, New Hampshire. Age 20 found him traveling west to become a teacher, but while visiting on the way at Buffalo, New York, the financial panic of 1857 hit, his money became severely depreciated, and his westward trek ended. He got a job logging.

Returning home to Danby, he opened a general store with the financial assistance of his father's endorsement of a security note. But the New York City merchants withheld credit until his cousin, H. G. Lapham, guaranteed his accounts. He eventually succeeded as a general merchant and within four years was one of Danby's more substantial businessmen. His store operated under the name of S. L. Griffith & Company, although he had no partner; the "& Company" permitted him to keep his store and his lumber business accounts separate. During this time he married Elizabeth M. Staples, on May 20, 1863.

In 1864 (at age 27) his business was worth \$48,000; the next year he sold the store part of it to his brothers C. H. and W. B. Griffith. Through foreclosure of a mortgage, he took possession of a vast tract of land in Mount Tabor, bordering Danby on the east and characterized by its mountainous terrain. Griffith now pursued the business of logging and lumbering, acquired additional land, and built many sawmills. Noticing the amounts of slash, cull logs, and other discarded waste wood from the sawmills, in 1872 he began to use this to make charcoal.

He initially contracted with the Barnum Richardson Company, which operated a number of blast furnaces and forges in northwestern Connecticut. Barnum Richardson Company was founded by Milo Barnum of Dover Plains, New York and Leonard Richardson, Milo's brother-in-law. By the 1880s, the company was run by William H. Barnum, and by then it owned and operated five foundries in Chicago, Jersey City, and Lime Rock, Connecticut, plus eight blast furnaces, each needing 1,200 bushels of charcoal per day (Cantwell July 1989:21). In addition to the many charcoal kilns it operated in other parts of Vermont (see Mad Tom Brook Area Sites), the company operated two charcoal kilns at Barnumville just west of the railroad siding (Child 1880:142). The contract called for Griffith to produce a million bushels of charcoal at the selling price of 13½¢ per bushel (\$135,000) on board railroad cars at Danby Station. The contract was subsequently increased by Mr. Barnum to 13¼¢ per, for 1,250,000 bushels (\$165,625) for his own Lime Rock Iron Company. But after receiving less than half of the charcoal, the Connecticut companies refused any further shipments, claiming the charcoal was not up to their specifications, when actually a disastrous drop in the selling price of pig iron had hit the market. Griffith responded by suing the firms for \$100,000, but an agreement was worked out. Barnum continued to buy charcoal with contracts made orally each year thereafter, and in time, Griffith and Barnum became trusted businessmen and good friends. Griffith said later that Mr. Barnum and also Philip M. Moen of the Washburn & Moen Wire Works at Worcester, Massachusetts, were his two best friends.

In time, Griffith developed the largest individually owned



6-3. Silas L. Griffith and his logging and charcoal works at Old Job as illustrated on a library bookplate (courtesy S. L. Griffith Memorial Library, Danby).

business in Vermont. In addition to his charcoal and lumbering businesses, he had large property and business interests with Eugene McIntyre and others in Peru, Arlington, Dorset, Manchester, and Wallingford. He also owned a large tract at Groton in partnership with Charles L. Sowle. His total property exceeded 50,000 acres, he owned more than 200 horses, and his payroll included over 600 people, which calculates to the equivalent of a moderate-size contemporary Vermont township. He cut about 24,000 feet of spruce and a million feet of hardwood for lumber, and 1,000 cords of fuel wood, most of which became charcoal.

He owned nine sawmills, at least three dozen charcoal kilns, and maintained six general stores. From the large stock maintained at his main store at Danby, other smaller stores at his logging villages and camps drew their supplies. Connected with his works at Danby Station he had a large steam mill for grinding feed; adjoining this mill was another for making shooks (barrel staves) and boxes made from lumber not suitable for other purposes. Another shop repaired wagons and sleds; yet another

repaired harnesses. He was a pioneer in the use of saws in place of axes to cut down trees, reducing waste wood. All lumber not marketable became charcoal. He even found a market for all the sawdust (possibly for packing and storing blocks of ice). Each of his mills was connected to his main office at Danby by a private telephone wire, generally thought to have been the earliest use of the telephone in Vermont. His office was very modern and elegant for the time—lighted by acetylene gas and heated by hot water. To satisfy his needs and those of the town he built a waterworks, drawing from a spring two miles from the village. And in response to an expressed need by the village, he opened a public meat market at Danby.

At Buffum Pond, renamed Lake Griffith, he built a summer home and in his later years owned a winter residence called The Palms at National City, south of San Diego, California, where he died on July 21, 1903 at age 66. He had served in the Vermont Senate and was often mentioned as a candidate for governor, but always declined. He left a number of benefactions on his death in which Mount Tabor and Danby shared, including a fund to provide support for schools and purchase of shoes and clothing for poor children. He also left money for annual Christmas gifts for the children of Danby, which continues to this day (Daley Winter 1986:8). His desire to sponsor construction and maintenance of a public library was fulfilled by his family: the S. L. Griffith Memorial Library still serves the town. His grave is at the south end of the Scottsville cemetery, about two miles north of the village and across the valley from Mount Tabor.

Griffith's charcoal-making areas were mainly in the town of Mount Tabor. Here he operated at least 36 charcoal kilns located at many sites: Mill Glen (Old Job), Ten Kilns Meadow, Four Kilns (near Greeley Mills), the Black Branch Job, and at the railroad station down in the valley at Danby village (the depot and kilns were just inside the Mount Tabor town line). Each of these operations supported settlements of varying sizes consisting of woodchoppers, colliers, teamsters, and their families. The Mount Tabor kilns annually converted 20,000 cords of wood into 1,000,000 bushels of charcoal, shipping it all from tiny Danby Depot to customers throughout the northeast.

Griffith's initial venture into the charcoal business began at a small settlement called Mill Glen where a sawmill had been built and operated by Frank Butler in 1854. The sawmill burned sometime after coming into the possession of Griffith, who rebuilt it to operate by steam engine. The mill had an annual capacity of two to three million feet of lumber. Lath and shingles were also cut here. These were all cut from the better grades of wood. In the lesser grades and the immense amount of scrap, Griffith recognized additional profit, and in 1872 it prompted him to build his first six charcoal kilns, at Mill Glen. In time, two more kilns were added to these operations which, by the late 1880s, were described as comprising 40 to 50 structures and buildings. These included the steam-operated sawmill measuring 40 by 80 feet, which made lumber from the choice hardwood and cordwood of the balance for the kilns. There were also a large boardinghouse for single men, tenant houses and cottages for families, a schoolhouse, general store and office, harness shop, wagon shop, blacksmith shop, and stables for the animals. The houses were furnished rent free, supplies near cost, and as many needs as possible met on the spot. When

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the post office opened the community was known as Griffith, and so identified on the 1893 USGS topographic map. From this settlement, a hundred men in gangs of 12 to 15 men each cut wood from October to April. Some remained in the woods living in log shanties (note Three Shanties Brook about a mile south) while others returned nightly to the settlement.

Mount Tabor Area Charcoal Sites: The Big Branch, formed by the juncture of Ten Kilns Brook and Lake Brook, originates where the community of Griffith once stood. About a mile up Ten Kilns Brook was a second extensive charcoal-making settlement containing 10 kilns at two sites, five kilns at each. It was also known as the Summit Job, in reference to being uphill from Griffith, although "summit" here is misleading. It is only about 300 feet in elevation higher than Griffith, with much higher hilltops all around. Initial date of operation at Ten Kilns is unknown, but it was described as well under way by 1885.

A mile downstream from Griffith was a third charcoal-making operation known as Four Kilns, named for the four kilns there. The ca.-1840 Greeley sawmill was built a bit down and across the stream. When the sawmill passed to Silas Griffith, it was reported no longer in operation.

About a mile farther downstream is the juncture with the Black Branch Brook, and a half-mile up this brook was the Black Branch Job, where a fourth charcoal-making settlement existed. Here were nine more kilns at a community that was about the size of the little village of Griffith. By 1885, the settlement included a blacksmith and wagon repair shop, a school, and some 20 tenant houses. Operations probably ended the same time as the others at Mount Tabor, although many people continued living in the vicinity until the 1940s.

A fifth group of charcoal kilns was at Danby Depot. Four kilns operated here, alongside a railroad siding just northeast of the railroad station.

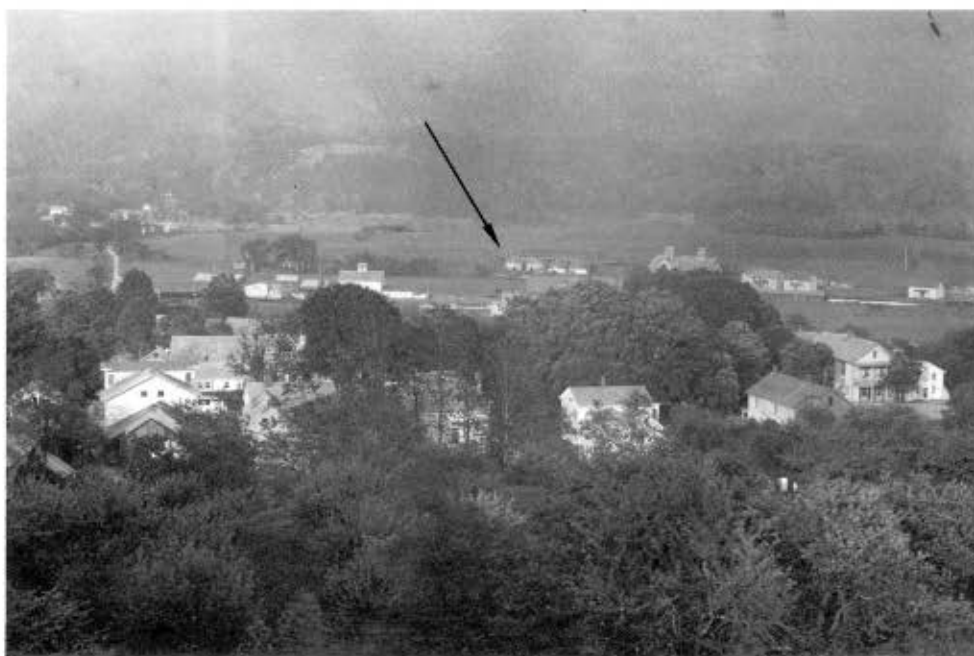
The lumber and charcoal industry at Mount Tabor made a fortune for the Griffith and McIntyre partnership. The operations also attracted the attention of writers and artists, one publishing a romanticized illustrated description of the charcoal business in an 1885 magazine (Chapin April 1885:9-10). In 1893 Griffith charred a whole maple log many feet in diameter in one of his kilns and shipped it nearly a thousand miles for exhibition at the World's Columbian Exposition in Chicago (*Inventory* 1941:10). The log was probably charred at one of the kilns at the depot, since they were directly adjacent to the railroad tracks.

Within a few years, the efficiency of the woodchoppers at Mount Tabor resulted in the depletion of the forest. The sawmill at Griffith closed about 1905, the kilns cooled, and in seven years, the village was nearly deserted. A 1912 photo shows the kilns still standing along with some other structures. The property was sold to a New York lumber company and later the second-growth timber was cut to fuel a lime-burning business at South End (chapter 8, RU-157). It was probably about this time the abortive attempt was made to build a railroad up the Big Branch from the main line near South End. The old right-of-way can still be seen east off Route 7, just south of the cemetery. By 1930, the population of Mount Tabor had dropped to 130 and a few years later most of Silas Griffith's original holdings in the town became part of the newly created Green Mountain National Forest.

The sites of the charcoal kilns were inspected in the summer of 1982 when 33 of the 35 documented kiln ruins were found. The 34th was located in 1983 and the 35th in the spring of 1985. Not a total surprise, an undocumented 36th kiln ruin was found in the summer of 1985 northwest of Old Job.

RU-78 Old Job (Mount Tabor): The ruins of seven charcoal kilns were found at Old Job in the summer of 1982. Surface

6-4. A ca.-1910 postcard showing the four charcoal kilns (arrow) at Danby Station.



remains of the eighth were found the next spring, astride the alternate Lake Brook Trail immediately southwest of the juncture of Ten Kilns Brook and Lake Brook.

Inspection of the site resulted in finding seven of the ruins in high brush and trees northwest of the trail. On the opposite side of the trail from the ruins is a mound of sawdust. There are also cellar holes to the west of the kiln ruins. At the northwest end of the seven ruins the eighth kiln site was found the following spring before the high brush season, barely a circular rise on the ground.

Some collapsed bricks were cleared from facing sides of one ruin in order to study wall design, course structure, vent location, and depth and design of the kiln foundation.



6-5. One variety of charcoal kiln top-loading-hole cover at Old Job.

At Griffith, now identified as Old Job on the maps, the eight kiln ruins are in dense brush a few dozen feet south of the Lake Brook Trail. On the opposite side of the trail is a 30-foot-high by 200-foot-diameter mound of sawdust, a giant artifact of a more recent woodworking operation; there is no connection to the charcoal kilns. Cellar holes in the high grass still contain broken domestic remains of the settlement and evidence of potholing for bottles and souvenirs is widespread. Badly rusted horseshoes and cracked axe heads are found lying about everywhere. No kilns remain standing anywhere; all are collapsed, leaving approximately 28-foot-diameter circles of brick walls, a foot or two high. In some walls the ankle vents can still be seen. Most iron hardware (iron bands, doors, lintels, rings, etc.) has disappeared, probably collected for scrap during World War II. Much brick is also gone, scavenged by collectors and campers through the years.

RU-79 Ten Kilns Brook (Mount Tabor): The ruins of the Ten Kilns Brook sites were found in two groups of five ruins each in the vicinity of the Forest Road 10 bridge at Ten Kilns Brook, about a mile upstream from Old Job (RU-78). The upper set of five ruins is located on the north side of Ten Kilns Brook, about 100 feet east of the road. The round brick ruins lie in a generally east-west line parallel to the stone retaining



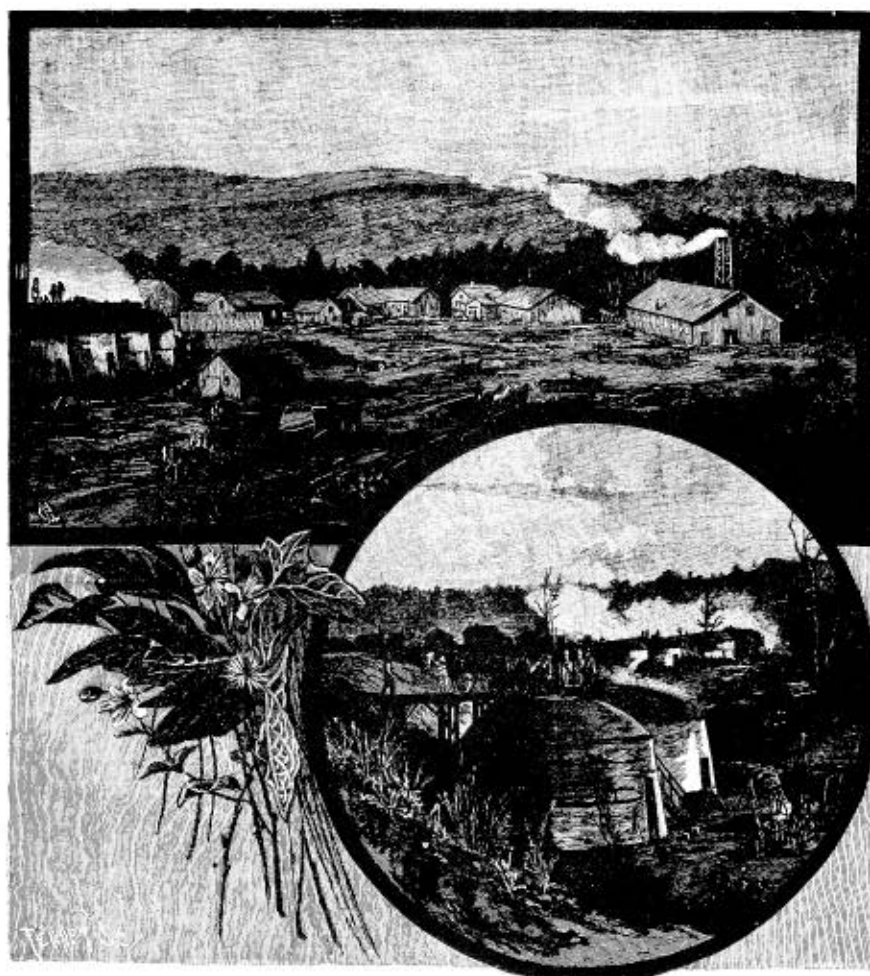
6-6. A top-loading-hole cover, unearthed at the Four Kilns site in Mount Tabor.

wall that provided loading bridge access to the tops of the kilns. No iron bands or vents were found, but other hardware lies in the vicinity. Large 2- by 3-inch pieces of charcoal lie about the ruins.

The lower set of ruins is located on the opposite side of the



6-7. A very heavy cast-iron sill plate for a front-loading door, unearthed near the remains of a charcoal kiln at the Little Black Branch site in Mount Tabor.



6-8. *Old Job, high up in the Green Mountains at Mount Tabor in the 1880s, showing: (top) the sawmill at right, charcoal kilns at left, and housing in between; and (bottom) charcoal kilns along the Big Branch (Chapin April 1885:15).*

road and about 100 feet southwest of the concrete bridge. Except that these ruins lie in a generally north-south line, the character of the ruins is about the same as the upper set. A possible cellar hole is located near the road, and there is a length of railroad track in the proximity of the ruins. The track was probably left over from construction of the concrete bridge (track can be seen as part of the bridge reinforcement). The usual kiln hardware also lies scattered about the site.

Between the ruins and the brook is a small camping/picnic area. Camp was set up here the day before in anticipation of finding the area kiln ruins. The upper site was found later that first day; the search for the lower site was left for the next day. What a surprise to discover the next day that the tent had been pitched the previous day in thick grass straddling the ground-level wall of one kiln remain of the lower site. We had slept the night before half in and half out of what was left of the kiln ruin.

Across and below the brook are some features that might relate to an earlier blacksmith shop and a sawmill indicated here in the 1869 Beers map of Mount Tabor. Ten Kilns Brook flows down a series of good falls, beginning at the bridge and continuing for about 150 feet. A cellar hole that contains charcoal is near the upper falls. About 50 feet west a flume runs

parallel to the brook, containing 13 iron hoops that might have held a circular wood pipe. All the iron hoops are flattened; diameter is estimated at 18 inches. The flume ends at the brook next to another building feature. Domestic debris lies scattered about the surface. Closer to the road is a low mound of red brick.

No cellar holes to support a work force could be found in the vicinity of the ruins. There has been recent logging immediately north and northwest of the ruins and any cellar holes here might have been destroyed.

RU-84 Black Branch (Mount Tabor): Ruins of the Black Branch kilns are a one-minute walk north along the Long Trail from the Forest Road 10 parking area, between the two concrete bridges. Here at Black Branch Job are the remains of nine kilns. Seven of the ruins lie along the Long Trail north of the road. The first pair of ruins lie about 250 feet up the trail from the road, the next five in another group about 300 feet farther up; the first three are on a lower level and the other two on an upper level. On the embankment behind the higher two ruins are the stone wall remains of a charging and loading platform.

An old road atop this embankment parallels the ruins back downhill to the road. It can be picked up continuing south of the road below the parking area along the east bank of the Little Black Branch to a crossing at the Big Black Branch juncture.



6-9. In the lower right corner it reads "Carting Coal down the Mountain." This was once a common scene along the high trails in Mount Tabor (Chapin April 1885:13).

There are no visible remains of a bridge here but the road can be seen continuing downhill along the west bank of the Black Branch, and probably connects with the old road along the Big Branch that connects Danby Station with Old Job and points east. South of the parking lot area and alongside the old road are stone walls and hardware. These might mark the site of the sawmill.

The eighth and ninth ruins of this group are less visible to the west along the Little Black Branch. The ninth is only barely visible just downstream of the eighth.

Much of the brick from these ruins, as with others, was used for trail maintenance, as evidenced by the red bricks that lie in the trail. No cellar holes of this once-bustling community have been found.

RU-85 Four Kilns (Mount Tabor): The site consists of two sets of two ruins each, on about an east-west line and 160 feet apart. The west pair have only small sections of foundation stones to mark the sites of two kilns. The east pair are more obvious with their brick walls and vent holes. Much of the brick from these kilns was used in the maintenance of nearby Lake Brook Trail, which passes between the ruins and the embankment of Black Branch Brook, and also along the trail about a quarter-mile to the east near a spring. (The U.S. Forest Service dynamited the standing kilns years ago, considering them at the time hazards to hikers, who camped in some of them.) Below the embankment are partially buried remains of kiln hardware, parts of stoves, and other unidentified objects.

At Four Kilns, the Lake Brook Trail joins the Long Trail. Northward and across the trail suspension bridge from Four

Kilns are the cavernous foundation hole remains of the Greeley sawmill.

RU-86 Greeley's Mills Charcoal Area (Mount Tabor): The remains of Greeley's Mills are located on the north side of the Big Branch Brook, just downstream from the Long Trail suspension bridge over the brook and a few hundred feet downstream of the charcoal kiln ruins at Four Kilns. The mill was built in 1840; the 1869 Beers map of Mount Tabor indicates Greeley's Mills at the site, a sawmill, and the names O. and A. Greeley. By 1885, the mill had passed into the hands of Silas Griffith.

Remains of an approximately 20-foot-deep sawmill cellar hole and foundation are visible about 120 feet downstream of the Long Trail suspension bridge. The trail barely squeezes between the deep foundation hole on one side and the steep bank of the brook on the other. Upstream of the foundation are dozens of partially buried iron hoops, all nearly in a straight line and about 6 to 12 inches apart. One iron hoop measured about 8 feet around the outside, which calculates to a 27- to 28-inch-diameter pipe, depending on the thickness of the pipe wall. The race connected the mill to an upstream flume, foundations of which lie precariously close to the concrete footing for the trail bridge.

Immediately uphill of the mill site are hundreds of feet of stone wall and within the walls are two cellar holes, a cemetery, and an area of ground near the center covered with charcoal. No cellar holes appear in the immediate vicinity of the charcoal, and the charcoal resembles that at kiln sites, ruling out a possible burned-down structure. A low stone wall directly uphill from the charcoal forms a definite boundary between the charcoal



6-10. Charcoal kilns in operation at Old Job during the 1880s; note the schoolhouse at left (courtesy John Griffith, Jr.).



6-11. Smoke-shrouded charcoal kilns in operation at Old Job. Note cordwood on the hillside waiting to be loaded into the kilns, and a charcoal wagon in the foreground (courtesy John Griffith, Jr.).



6-12. The abandoned charcoal kilns at Old Job about 1912, looking westward. Although the kilns were shut down, intermittent logging continued and the houses in the background were still occupied (courtesy UVM Special Collections Library).

and non-charcoal areas. Leading west from the charcoal area is a faint road. The road passes south of a cellar hole about 100 feet away from the charcoal area. No charcoal of any significant amount was found in this road, nor in the cellar hole it passed by. The charcoal is at least a foot deep in some places, as measured in three places. No kiln bricks were found on the ground or in any test pit. Since the charcoal area is 200 to 300 feet from and about 50 feet higher than the mill area, it is difficult to understand why charcoal might have been hauled up to this place. It is also difficult to understand whether the charcoal on the ground just downhill from the concentrated charcoal area was dropped there from wagons hauling it up (or down), or merely washed downhill over the years. The charcoal might have been made by the mound method, but if so, why is the charcoal uphill from the sawmill, if in fact the mill was where the remains are today.

RU-FS19 Danby Station (Mount Tabor): Although they were still fully standing in the 1950s, no ruins exist of the four kilns Griffith operated at the Mount Tabor railroad siding, just northeast of the station (called Danby Depot or Danby Station due to its proximity to the town of Danby, although it is in Mount Tabor). Only the outline of the siding can be detected where railroad cars once lined up to load logs and charcoal. The siding was just northeast of the old railroad station, which today houses general businesses. The actual site of the kilns is the front yard of the late Ralph Carvage, who had always wondered why his soil was so black and why so many bricks surfaced in his garden every spring.

RU-108 Kiln #36 (Mount Tabor): The Rutland County history published in 1886 mentions that 35 charcoal kilns were constructed by Silas Griffith at Mount Tabor (Smith and Rann 1886:696). That number has been quoted in later histories as if no other kilns were built after 1886. Since charcoal operations did not end until 1905, there was the chance that Griffith might have built other kilns. And as a result of searching the area for additional ruins, one was found in the fall of 1985 about 100 feet downstream of the "old wood road" crossing at Big Branch.

The ruin is on the north side of the brook, the opposite side from the trail between Old Job and Four Kilns. The ruin is a brick-type with walls about 3½ feet high. A large quantity of brick forms a talus slope outside the walls and nearly fills the inside of the ruin. Much hardware is in the ruin plus metal trash scattered about the immediate vicinity. Roads leading east and west seem to end in washouts.

The site is in marked contrast to those found elsewhere in Mount Tabor and would make an excellent study site. The remoteness of the ruin from well-traveled trails has apparently preserved it from scavengers and dynamiters as well.

RU-160 Danby Mountain Road Charcoal Kilns (Danby): A site of four charcoal kilns was found in 1986 from information provided by Nelson Jaquay of Tinmouth. The site is about 50 feet southeast of a cabin, east off and visible from Danby Mountain Road, about a quarter-mile down the Danby side of the top of the hill. It is uphill and on the opposite (east) side of the road from a spring, running into the roadside through a pipe. The kiln remains are in moderately heavy brush, off the

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south side of the driveway, at a point about opposite the halfway point between the Danby Mountain Road and the cabin.

Three of the four 28-foot-diameter brick-type ruins lie in about an east-west line, about 10 feet apart. The fourth kiln is dogleg to the south from the easternmost kiln ruin. They are nestled into the base of a low knoll, near the top of which is a low stone wall. Neither supporting nor reinforcing hardware were visible on the surface; no vent holes could be seen. The tops of the walls were nearly at ground level with only a low circular mound to indicate the approximate location of the wall.

Atop the knoll above the kiln ruins is what appears to be a base for a sawmill, possibly a boiler. The faint indication of a road leads from uphill to the south from this possible sawmill base. Another road appears to lead uphill a few dozen feet west of the base.

No history is known of this charcoal kiln site but proximity

to Danby Station hints at a possible connection with the Griffith and McIntyre charcoal operations across the valley at Mount Tabor. According to local tradition, much charcoal was made on the slopes of Dorset Mountain, meaning that many mound remains and kiln ruins are still there, waiting to be rediscovered.

WINDSOR COUNTY

WN-CK01 Salt Ash Mountain Charcoal Kilns (Plymouth): The 1869 Beers map of Plymouth indicates "Spaffic [sic] Iron Co's Wood Land" on the north slope of Salt Ash Mountain, where the Spathic Iron Company obtained wood for making charcoal for its furnace at Tyson. The Spathic Iron Company succeeded the Tyson Iron Company at the close of the Civil War (see chapter 4, WN-51). No attempt has been made to inspect the area.



6-13. It is not known for sure, but these might have been the easternmost five of the eight charcoal kilns at Old Job, determined by matching the number of iron bands in this photo with those on the kilns in figure 6-12. Notice the wicker scoop at left, used instead of iron shovels to remove charcoal from the kiln so as not to break the charcoal into small pieces (courtesy Mr. and Mrs. Karl Pfister).



6-14. The four charcoal kilns at Danby Station as they appeared about 1950 (courtesy U.S. Forest Service, Manchester).

The Southern District

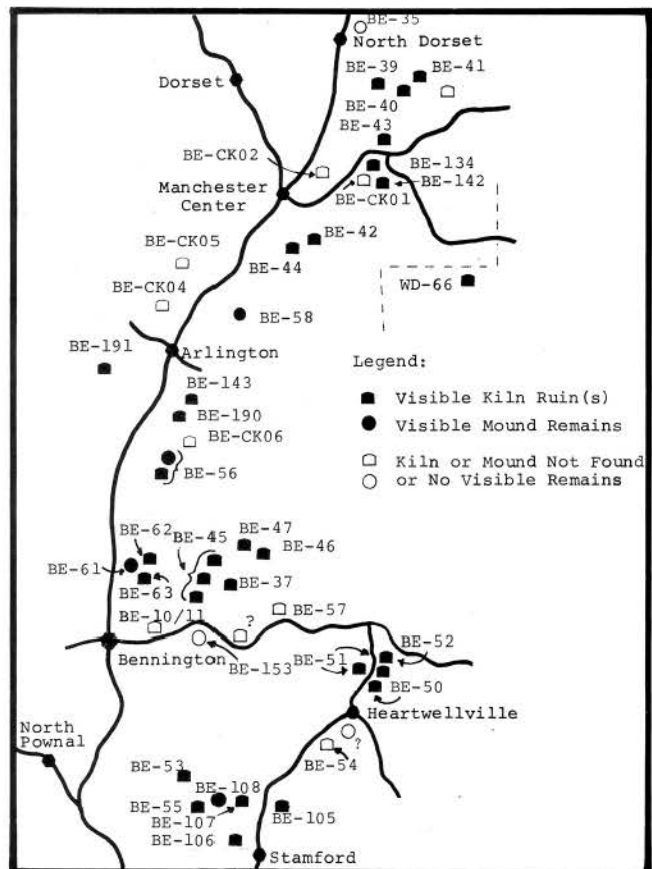
BENNINGTON COUNTY

The county with the largest number of charcoal remains/ruins found in the state was Bennington County. This could be interpreted to mean that the highest amount of charcoal-making activity occurred in this county, although this might or might not be so. Many more ironworks are known to have operated in Addison County, for example, whose charcoal-making areas have yet to be accurately determined or found. Charcoal in Bennington County, therefore, was made both for local demands and for export to outside markets.

Those outside markets existed in Richmond, Massachusetts, where the Richmond Iron Works leased large tracts of forestland in mountainous Stamford. Charcoal kilns in Peru were owned or leased by owners of blast furnaces in the Millerton, New York area. The Barnum Richardson Company of Salisbury, Connecticut operated many charcoal kilns in northern Bennington County (in addition to buying charcoal from Silas Griffith in Mount Tabor). Barnumville is a small community a few miles north of Manchester Depot on the Vermont Railway that took its name from the two Barnum Richardson Company charcoal kilns that operated just west of the railroad siding. McNaughton and Lawrence also made charcoal at Barnumville during the earlier 1870s.

About a hundred feet southeast of the collapsed blast furnace ruin at North Dorset is the site of a mound-type charcoal-making area. Recent logging operations bulldozed a roadway through the area and much charcoal was unearthed. No kiln brick was found (the furnace dated to the 1840 period, well before brick kilns were seen in the Green Mountains).

The 1875 Root & Jones chemical works in Bennington village produced charcoal as a by-product of wood distillation. The



6-15. Bennington County charcoal-making sites.

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village was also site of a charcoal kiln patented in 1829 by Isaac Doolittle (Hodge May 12, 1849:290). A sketch of the ironworks at East Bennington shows the four kiln buildings in the background, west of the furnaces (Hinsdill 1835).

Charcoal-making areas in the county were many. Some 28 ruins/remains were found in the Manchester-Winhall-Peru area; 26 in the Sunderland-Arlington-Glastenbury-Woodford area, and 23 more in the Stamford-Readsboro area. Many more kilns are known to have operated in the county, and a hike up most draws will probably reveal telltale mound remains if not more circular walls of stone or brick that mark the little pockets of early industry.

Mad Tom Brook Area Charcoal Sites: Some time before 1880, C. S. Maltby of New York purchased a sawmill in the western part of town near "the notch" where two brooks meet to form the Mad Tom Brook (Batchelder 1891:113-114). Earlier mills had sawed railroad ties out of thousands of birch trees here, sliding them down the two-mile-long water flume to the railroad siding below at East Dorset. Maltby, who owned a blast furnace at Millerton, New York from about 1864 to the 1880s, eventually built a number of charcoal kilns in Peru. There were at least 10 kilns operating in Peru at this time (Aldrich 1889:461; Child 1880:151). The kilns probably changed hands within a few years because in 1889 it was reported that charcoal was being made for Barnum Richardson Company, owner of ironworks in Connecticut and New York (C. S. Maltby and Barnum Richardson Company were competitors while the Millerton furnace was in operation; Barnum Richardson Company continued to make iron until 1920 in Canaan, Connecticut). The kilns were also reported to have made 1,000 bushels of charcoal from 35 cords of wood, significantly below the typical 40 to 50 bushels of charcoal per cord yield of kilns for the time. Barnum Richardson Company also

made charcoal at Barnumville (see BE-CK02).

Nine kiln ruins were located in 1983 at three sites along a one-mile stretch of the Mad Tom Brook, and might have been part of the charcoal-making operations of Maltby or Barnum Richardson Company (leaving at least one kiln ruin not found).

The ruins are at three sites of five, one, and three ruins west of the Notch in Peru along a mile stretch of the upper end of Mad Tom Brook. The sites are identified: Mad Tom Upper Kilns, Mad Tom Middle Kiln, and Mad Tom Lower Kilns. All were found in 1983 a few minutes walk off either side of an abandoned road that forks northwest off Forest Road 21 (Mad Tom Road), about 500 feet west of Forest Route 58 (Griffith Pond Road) intersection. The old road travels downhill most of the way, becoming more and more of a trail, and meets the Mad Tom Brook in about a mile. The trail is then identified as Forest Trail 5, continuing down the Mad Tom gorge to East Dorset.

BE-41 Mad Tom Upper Charcoal Kilns (Peru): This site of five kiln ruins lies about a half-mile west of the abandoned Mad Tom Road. A trail leads northeast off this road for about 300 feet to the site, which lies to the east of the trail. The kiln ruins lie in two groups, 100 feet apart, of three and two ruins each. Domestic trash and sheet metal lie in and about the kiln ruins, not related to the kiln operations but probably to recent logging in the area. One significant kiln-related artifact is a 5-foot-diameter iron charging hole cover, much different than those found at other sites. The cover has four 2- by 4-inch vents that can be opened and closed with a sliding iron plate.

All kilns in this complex were built into an embankment. Uphill from the kilns is an open field, probably used at one time for stacking cordwood for feeding the kilns. The trail from the road to the kiln site continues through the site, crosses a small brook, and continues (more kiln ruins beyond?). At the

6-16. A top-loading-hole cover found near Mad Tom Brook in Peru, showing one of four vent holes with a small sliding door that controlled draft into the charcoal kiln.



brook, another trail forks back around the westernmost kiln ruin to the clearing behind and above the site.

BE-40 Mad Tom Middle Charcoal Kiln (Peru): This single-kiln site lies about a half-mile farther west of the old abandoned road from Mad Tom Upper Kilns and immediately south of the road, which is now more of a trail than a road. The ruin is well hidden in heavy trees and brush and was found only because a piece of metal, which turned out to be part of a kiln door, was found sticking out of the ground along the south edge of the trail (it always pays to check everything out). On the opposite side of the trail is a pond; about 50 feet farther west down the trail is a small log bridge over the Mad Tom Brook. Some red brick was found in the brook near the bridge.

Finding the kiln had its humorous moment. After Bob West watched me dig the piece of kiln door out of the trail and inspect it, he chided me as I went into the woods to reconnoiter. On finding the kiln ruin I called to Bob, who refused to believe I had found anything. He had gotten directions to the other two kiln sites (BE-41, -39) from local hunters who frequented the area but said nothing about a kiln ruin in the woods here. It took some coaxing to get Bob to see my "discovery." A search in the immediate area failed to locate another kiln; no clearing was found above the embankment into which the kiln was built. It is unknown if this ruin is the single charcoal kiln illustrated in a recently published town history (Beattie 1977:17).

BE-39 Mad Tom Lower Charcoal Kilns (Peru): This site of three kiln ruins lies less than a mile west of Mad Tom Upper Kilns. At this point, Mad Tom Brook is joined by a tributary from the south and the old road crossed (no bridge) Mad Tom Brook to continue along its north bank. The three-kiln site is across the tributary just downstream from the juncture, and some 300 feet uphill in a west-southwest direction. The kiln ruins lie in a triangular pattern; the two uphill ruins each lie about 20 feet from and about 12 to 15 feet higher than the center ruin. Faint trails leading upward and sideways from the site seem to peter out. No clearing was found above the site, but there does appear to be a clearing between the site and the brook. Much kiln brick lies near the brook but appears part of debris (stumps, slash, oil cans) dumped here. There might have been a logging bridge here.

While at the site, two men from Manchester drove down the trail in a jeep and joined us in inspecting the site. They listened intently as we explained the reason for all the bricks and the function of the charcoal kilns after which the father indicated his intent to return soon to "get all that free brick."

Snow Valley Area Charcoal Sites: The Snow Valley area is generally the mountainous northwestern corner of Winhall, its name taken from a ski resort that once operated here. Charcoal kilns in this area operated at near the 2,000-foot elevation and were part of the broader charcoal-making region extending from the north at Peru and Mount Tabor to the south along the west flank of the Green Mountain Range. Most ruins in this area are within a few minutes walk along established trails from Routes 30 and 11.

BE-CK01 Snow Valley Charcoal Kiln (Winhall): One unlocated kiln site hides somewhere along the north-northeast ridge of a mountain in the vicinity of the old Snow Valley ski area. Numerous hikes on the mountain in search of the elusive ruin led to finding other kilns in the general area, but not the one

that local tradition insists is nearer to the now-quiet ski lifts. The search continues.

BE-CK02 Barnumville Charcoal Kilns (Manchester): This small community two miles north of Manchester Center got its name from the two charcoal kilns operated here by Barnum Richardson Company of Salisbury, Connecticut. The kilns were located west of the railroad track a short distance south of the south crossing. The McNaughton & Lawrence Company also made charcoal here during the earlier 1870s (Bigelow and Otis 1961:147,151). At least one kiln was still operating on November 28, 1890 according to a Montpelier newspaper of that date, which said "The business of Barnumville is in lumber and the burning of charcoal in a large brick furnace constructed from a portion of the bricks of the old church in Manchester village of twenty years ago" (Mary Bort letter to author, June 12, 1991).

The area of the railroad tracks in the center of Barnumville and areas well north and south were inspected in 1985 with no kilns or signs of charcoal found. Most likely, later development along the railroad tracks obliterated any surface signs of the charcoal operations here. Local residents knew nothing of charcoal kilns.

BE-43 Bromley Brook Charcoal Kilns (Winhall): Four kiln ruins lie along the Long Trail about five minutes hike north of the parking area along Routes 11 and 30, about four miles east of Manchester Depot. The ruins are in two groups of two each, about 30 feet apart a dozen feet south of the trail. They were found in 1982 with the guidance of Sandy Partridge of Proctor. The ruins are not difficult to find since the trail here is black with charcoal runoff from the ruins.



6-17. One of four brick-type charcoal kiln ruins along Long Trail at the 1,900-foot elevation, just north of Routes 11 and 30 in Winhall.

Tradition has it that the bricks initially came from the First Congregational Church in Manchester: "In April 1871, laborers found the old brick edifice so well and strongly built that it was difficult to tear down. Some of the bricks are supposedly still in the woods north of the Peru Road on the Long Trail

200 Years of Soot and Sweat

where they were used for charcoal kilns" (Bigelow and Otis 1961:45).

BE-134 Old Route 30 Charcoal Kiln (Winhall): The ruin of a single brick-type charcoal kiln was located in 1988. Bob West found the ruin based on information from a U.S. forest ranger in the process of relocating a section of the Long Trail south from Route 30.

The site is situated in the inside curve (east) of the Long Trail, about a quarter-mile south of Route 30. About 100 feet farther south of the site, the Trail crosses a small brook on a wooden trail bridge, the first such bridge south of the highway. A few hundred yards west of this area is the old Vermont Route 30 and 11 junction (now replaced by the newer junction, about a mile northeast).

The ruin is a rough circle of broken red brick, about 3 to 4 feet thick and 3 feet high. Some of the bricks are coated with burnt-on pitch. Along the northwest periphery of the ruin is a low stone wall, possibly a kiln foundation or retaining wall. The rise behind the ruin is cut into and probably provided support for a bridge to the top of the kiln. A round kiln cover was the only hardware found. Brick and charcoal also lie scattered outside the ruin and over the bank west of the ruin to the side of an old southeast-to-northwest running road. About 100 feet north of the ruin is a small cellar hole, possibly connected with the kiln operation.

The 1869 Beers map of Winhall shows a sawmill along Bromley Brook, a few hundred yards west, which might have been contemporary and/or associated with this kiln.

According to Bob West, the old Routes 11 and 30 were in use until about 1946 or 1947. Due to bridge washouts, the adjacent parallel road was later built and this avoided two bridges. The present highway takes a more gradual, if circuitous, route to the top of the mountain. The area is an interesting study of how the wilderness has taken over after 30-plus years of abandonment.

BE-142 Sylvan Ridge Charcoal Kilns (Winhall): Ruins of two stone-type kilns were found by Bob West in May 1989 in the woods a few hundred feet behind the home of a part-time resident on Sylvan Ridge Road. The site is about a quarter-mile west of the Signal Hill Road intersection.

The ruins are side by side, on a narrow rise of ground cut into the hill behind. The wall of one ruin stands 6 feet high with bricks still in their vent holes. The bare hint of an ancient road leads from the narrow flat in front of the ruins, around the northernmost ruin, and uphill behind the ruins. Nothing historical is known about these ruins although they most likely predate the brick-type kilns in the area.

Rootville Area Charcoal Sites: Near the southwestern corner of Winhall near Bourn Brook and the abandoned mountain community of Rootville, 12 kilns were operated by Barnum Richardson Company. A row of eight kiln ruins are at one site west of the brook and four ruins are about a mile to the east across the brook and over the hill. These kilns made an estimated 240,000 bushels of charcoal annually (Child 1880:211).

Typical of many mountaintop industrial hamlets in Vermont, the village of Rootville was 2,256 feet high up the mountain,



6-18. The eight charcoal kilns near Bourn Brook in 1893, a few years after they ceased operation and became overgrown with brush. Note that two kilns, in the middle and rear, had already collapsed (courtesy Mr. and Mrs. Daly Rizio).

near the source of Bourn Brook. Named after Henry Root, the community came to life in the mid-1800s around his lumber and sawmills (Swift 1977:110-111). The 1869 Beers map of Winhall shows three sawmills, a shop, and five houses at Rootville. During 1912–1919, the area resounded to the huff and puff of a logging railroad. All that remains of the Rootville area today are cellar holes and mill foundations, and the old railroad right-of-way that makes today's excellent hiking trail.

BE-44 Bourn Brook Charcoal Kilns (Winhall): The size of this site bears witness to the extensiveness of charcoal making in the Lye Brook wilderness area. Ruins of eight kilns were found a few hundred feet west of Bourn Brook in 1983, after miles (and weekends) of unsuccessful searching that started the year before. Final location of the site was provided by Bob West's uncle, who indicated that *two* bridges had to be crossed to get to it (we had been crossing only one bridge).

No historical documentation is known in connection with the ruins except that they might be part of the overall operations of Barnum Richardson Company. The site might also have been related to logging operations at Rootville, less than a mile to the southeast, and also to the four-kiln site (BE-42) about a half-mile west.

The eight kiln ruins lie in a north-south line beside a broad clearing. The brick walls of some ruins are up to 4 feet high; most are about a foot high. Much iron hardware is in evidence: charging hole covers, iron bands, rods, and a section of railroad track (from the logging-train era?).

The site is two miles up the old Rootville road, which runs from the base of Downer's Glen, across the footbridge just downstream of a private hunting camp, and along an abandoned section of the Long Trail to the Douglas Shelter. About a

half-mile south of the shelter, just short of abandoned Rootville, the trail curves to within sight of Bourn Brook. Here is a



6-20. A top-loading-hole cover with another smaller, removable cover, found at the Bourn Brook site.

single-log footbridge across the brook near an abandoned bridge abutment, across which is a barely visible trail on the left that climbs uphill for a quarter-mile to the broad clearing on the left.



6-19. Ruins of one of the eight charcoal kilns in figure 6-18 in the 1980s. Nearby is the abandoned logging village of Rootville.

BE-42 Winhall River Charcoal Kilns (Winhall): The Long Trail was rerouted a few years ago and now hikers pass within a hundred feet of four charcoal kiln ruins. They were found in 1983, up a seasonal brook that drains the kiln area. The kilns were probably operated by Barnum Richardson Company.

There is a broad clearing in front of the ruins and a cellar hole at the south end of the site, but the ruins lack the usual amount of hardware. According to local tradition, bricks from these ruins were used by the Swezey Lumber Company for construction of a nearby sawmill. The mill ruin (it burned in 1921) is about 100 feet southeast of the footbridge, near where the old and new Long Trails meet. Many bricks from both ruins have also been scavenged for use in fireplaces and chimneys in some East Manchester homes.

An old road runs uphill south of the site, at right angles from the Long Trail, and intersects Dufresne Road, an older Trail alternate. Bushwhacking across the road and westward will intersect with the old Long Trail near the Bourn Brook crossing to BE-44.

Green Mountain Ridge Charcoal Sites: Henry Burden & Sons operated two charcoal kilns near his blast furnace at South Shaftsbury (Beers *Bennington* 1869:21). Burden also operated along Fayville Branch (Peter's Branch) in northern Glastenbury. One brick and one mound-type kiln were found in this area. Four stone-type kilns and a mound-type were found 2,200 feet up East Mountain near the Shaftsbury-Glastenbury line.

According to historical accounts, Henry Burden obtained charcoal from hundreds of acres of hardwood on East Mountain (Levin 1978:49). The area of the stone-built kilns ruins was once known as "the Burden Lots" (Edwin Colvin to author, May 12, 1985). There are probably undocumented ruins and remains of many stone- and mound-type kilns in these mountains.

Other charcoal makers in Shaftsbury included C. Harrington and L. Twitchell who lived in the eastern part of town and almost in the shadow of East Mountain (Child 1880:458).

BE-58 Bacon Hollow Charcoal Mounds (Sunderland): Well up Bacon Hollow, east of Sunderland village alongside a trail that leads south from Mill Brook, are the remains of a charcoal-making area, and downstream are the remains of a sawmill and the community that once thrived around it.

The area was inspected in 1985 and one mound-type remain was found along a high, level ridge, about a mile east of Route 7. Charcoal was also noticed associated with disturbed earth in the vicinity of summer cabins along the main Hollow road and alongside Mill Brook. There are probably many more mound remains farther up the various draws of this mountain.

BE-143 Southwest Corner Charcoal Kiln (Sunderland): This single kiln ruin was found in 1991 by Dave Lacy, forest archaeologist, while marking the boundary of a tract of forest for logging. The site is about a mile southeast of the Arlington exit of Route 7, in the southwest corner of the town of Sunderland near the base of a ridge. It is well uphill and about a half-mile east of the highway.

The ruin consists of a collapsed circle of brick and one 4-inch-wide by 1/2-inch-thick reinforcement iron band that briefly sticks up through the circle of brick in three places. Nearby is a 54-inch-diameter top hole cover. The ruin is not well defined and shows evidence of having been eroded by spring freshets. The hint of a road leads downhill from the site,

connecting about a quarter-mile away with a road from the direction of another kiln ruin (BE-190). This downhill road contains pieces of whole and broken brick from the ruin.

BE-190 Northwest Corner Charcoal Kiln (Glastenbury): This single kiln ruin was found while searching for BE-143, about a half-mile north and probably at the same elevation. It appears much more remote than BE-143, however, which probably accounts for its much better condition. Two iron reinforcement bands of the same dimensions as that at BE-143 are here, and the circle of brick is better defined. No other iron hardware was in evidence.

BE-56 North Glastenbury Charcoal Kiln and Mound (Glastenbury): Reference to a resident of Glastenbury who built a swimming pool on a charcoal kiln site sounded a bit too intriguing to ignore (Levin 1978:93). The area was inspected in 1984 and the ruins of one brick-type kiln and a mound-type remain were found, within 100 feet of a small dammed pond. From the pipes, it was obviously the water supply for Dr. Sterba's summer home and probably the earlier swimming pool.

A kiln ruin and a mound remain almost side by side is interesting. Did the former replace the latter; did they operate simultaneously? The mound-type measured 40 feet in diameter. A local resident talked of kiln ruins both above and below Dr. Sterba's house, but inspection failed to uncover anything further.

BE-CK06 Fayville Charcoal Kiln (Glastenbury): Fayville was an 1870s logging community, deep in the woods and mountains about five miles southeast of Arlington village. There are hints of charcoal having been made at Fayville but a 1984 inspection of the site revealed a large clearing with many pieces of whole and broken red brick, unidentified hardware, and the usual surface scatter of domestic discard one finds at an abandoned 19th-century village. One blackened area on the western edge of the clearing looked intriguing but this was too little surface evidence to conclude it was either a charcoal kiln or mound site, or the remains of a burned structure. It was not until 1991 that a turn-of-the-century photo of a charcoal kiln appeared, attributed to Fayville (Robert Williams photo to author, Dec. 14, 1990). The obvious next step is to hike back to abandoned Fayville and attempt to orient the landscape in the photo to that of the area, and determine if that blackened area photo seven years ago was, in fact, the kiln site.

BE-61 East Mountain Charcoal Mounds (Shaftsbury): While searching for kiln ruins in 1985 along the 2,200-foot level of East Mountain, a site of one or more mound-type remains was found. Information that encouraged us up the side of this steep mountain was provided by Rob Woolmington of Bennington and Ed Colvin of Shaftsbury.

The site straddles a trail to two stone-type kiln ruins (BE-62) about 300 feet farther to the west. The mound remain is round with its usual outer, circular gutter depression. One corner is truncated by the trail; the opposite side cuts slightly into the hillside. Remains of either a smaller stone kiln or possibly a charcoal storage structure are about 25 feet to the southwest. Much charcoal is scattered about the entire area.

BE-62 and BE-63 Charcoal Kilns at "the Burden Lots" (Shaftsbury): The first site (BE-62) contains two stone-type kiln ruins, found previously by Rob Woolmington (Woolmington July 7, 1977:17-20). Each ruin is about 200 feet off

opposite sides of the trail and in relatively good condition, with the wall of one ruin 7 feet high. Both ruins measure 30 feet in diameter with walls up to 2½ feet thick near the base. Vent holes, some with bricks still inserted, are at ground, 2-foot, and 3-foot levels. The quantity of rock inside the kiln indicates the whole kiln, from ground up, was made of stone. The stone appeared uncut, the builders probably utilizing the abundance of stone lying about the area. The faint remains of a road leads from the main trail to each ruin. A kiln door was found in the proximity of each ruin, each with heavy iron handles attached. Its shape resembled that excavated from the conical kiln site at Readsboro.

The next site (BE-63) was found about an estimated half-mile north of the first (BE-62). No known trail leads from one site to the other; the site was found through verbal directions by Ed Colvin. The ruins are about 100 feet northeast of the tree marked KLN with an arrow pointing to the ruins, next to a small seasonal brook.

These two ruins appear to have the same dimensions as the previous two, although they are in much worse condition. Birch trees have fallen into each ruin, further collapsing the walls beneath them. The interior of each kiln contained much more brick than can be accounted for by vents, but little remains of any collapsed stone. The only hardware found was one piece of rusted sheet iron, possibly the rotted remains of a door. A trail leads west from the site headed for the side of the mountain, probably the route taken by the charcoal wagons.

Arlington Area Charcoal Sites: Benedict Hollow is a two-mile-long cleft between 3,109-foot Grass Mountain and 2,338-foot Big Spruce Mountain, about two miles west of Arlington village. Charcoal was made at the Pitman Farm in at least five kilns, "three in the upper clearing and two in the center clearing" per a ca.-1935 paper by Fred Bush (Russell Collection, Arlington). The original operator was John Smith, who sold to Eugene McIntyre, then in turn to Frederick Miles. McIntyre owned vast forest tracts in southern Vermont and might have been involved in charcoal operations there also. (The abandoned logging village of MacIntyre, named for Eugene McIntyre, is still identified on USGS topographical maps along the Sunderland-Glastenbury line, about two miles northeast of Fayville.) Miles was operator of blast furnaces at Salisbury, Connecticut and Copake, New York from the 1860s to his death in 1896. William and Frederick P. Miles continued the Copake operation until it was closed, probably about 1903. Since Frederick P. Miles operated the works only marginally with his brother and for only five years (it was leased from 1901 to 1903), it is assumed the Frederick Miles who operated the Benedict Hollow charcoal kilns is the Frederick (K.) Miles who died in 1896, giving a bracket of time, 1860s to 1896, when these charcoal kilns might have been in operation.

Miles eventually moved his charcoal operations about two miles north to the eastern slope of Red Mountain on "property above Mrs. Fisher's" where he operated several more kilns (Russell Collection, Arlington). He transported the charcoal down the mountain by means of a half-mile-long cog railway that was controlled by a drum at the top, alternately operating a pair of cars that had a capacity of 350 bushels of charcoal each. It is unknown for sure, however, whether this cog railway was built for Miles' Benedict Hollow or Red Mountain operations.

BE-191 Benedict Hollow Charcoal Kilns (Arlington): The remains of one or two brick-type charcoal kilns were found in 1991 at about the 1,400-foot elevation, two miles up Benedict Hollow Road, then another mile farther up a newly constructed logging road from where it branches west (uphill) from the main hollow road. The logging road continues uphill past two hairpin turns, the first doubling back uphill to the north, the second to the southwest. Just as the road starts to level a bit, red brick and black charcoal can be seen on both sides of the road. The road was cut directly through the site, destroying the ruins and making it impossible to determine whether this is Frederick Miles' two- or three-kiln site (or another?). The only hardware found was an 8-inch fork prong. Local resident Danny Andrews, who lives near the bottom of the hollow, gave directions to the site.

BE-CK04 Red Mountain Charcoal Site (Arlington): Archival data indicate that Frederick Miles of Copake, New York also operated one or more charcoal kilns about a half-mile up the east slope of Red Mountain (Russell Collection, Arlington). An area of the mountain about a half-mile up Fisher Road was searched in 1989 for a lime kiln ruin identified on an annotated 1900 edition USGS topographical map in the possession of Nancy Otis of Manchester. After a five-minute walk up a wood road that forks south from Fisher Road, what was initially thought to be the lime kiln ruin was found (see chapter 8, BE-LK07). But the "ruin" was later determined to be a stone-lined, 6-foot-deep cistern, associated with the remains of a foundation just uphill from it. A charcoal kiln top hole cover, complete with its original pair of iron handles and a small center hole, was found jammed inside the cistern under branches and leaves. A red brick was found in 1991 about 100 feet away in a small brook. At the time the cover was found, the possibility of charcoal kilns being in the vicinity was not known (we had a lime kiln ruin on our mind), so the discovery of a charcoal kiln cover was treated as an anomaly to be investigated later. The charcoal-making site has not been found at this writing. (The lime kiln ruin has not been found either, leading to speculation that a charcoal kiln ruin might have been misidentified on the annotated USGS map as a lime kiln ruin.)

BE-CK05 Sandgate Charcoal Plant (Sandgate): A "charcoal plant" operated in the Wilson Hollow area of Sandgate according to a 1950 letter to the late Dr. George Russell from the mayor of Cohoes, New York (Russell Collection, Arlington). The reference hints that Wilson Hollow is the Green River valley in Sandgate, but no Wilson Hollow can be found on any current or early maps. There is, however, a Wilcox Hollow in the town, well up the Green River valley. No attempt has been made to explore Wilcox Hollow for the charcoal plant.

Bolles Brook Area Charcoal Sites: About the same period that Burden's works at Shaftsbury were declining, the Bennington and Glastenbury Railroad, Mining, and Manufacturing Company was organized (Levin 1978:87-89). The company name was an attempt to cover all business eventualities in one collective title. Originally chartered in 1855, the company did not lay track until 1872, along the side of County Street in Bennington, over the stream, through private property, and directly in front of the old furnace stacks at Furnace Grove. The tracks continued to Woodford Hollow, thence up Bolles Brook to the forks. One track continued up the east fork about

a quarter-mile, and the other went up the west fork about a half-mile. Diagonally across the forks was another track that allowed trains to back up from one fork to the other so the engines could remain at the head of the train for the return run to Bennington. The tracks climbed over 1,200 feet in the eight miles from Bennington to the forks. The steepest grade on the main line was 230 feet per mile; one branch grade was 250 feet per mile, which at the time was considered to be the steepest grade of any standard gauge railroad in the country (Shaw May 1952:19-27).

The railroad company had purchased 18,000 acres in Woodford, Glastenbury, and Somerset, and constructed 18 charcoal kilns. At the end of the line at the forks the community of South Glastenbury developed, made up of loggers' housing, a boardinghouse, the steam-powered sawmill, blacksmith shop, company store, and a schoolhouse. The sawmill cut 1,000 board feet an hour and the charcoal kilns turned out 28,000 bushels of charcoal a month, all hauled out of the wilderness by the railroad. Alcohol to lubricate the woodcutters, some mail, goods for the store, and an occasional passenger came in on the return run. Within 20 years the mountain woodlands had been stripped. The Blizzard of '88 shut the railroad down for three months, and the next year the entire logging and charcoal operation closed for good.

With goals other than lumber and charcoal in mind, a new company replaced the track a few years later with heavier rail to support electric trolleys. The large boardinghouse was renovated and painted, becoming a hotel for vacationers. The old company store was converted into the Glastenbury Inn and the machinery removed from the sawmill to make room for a bowling alley, dance floor, and amusement hall. Trolleys initially ran from Bennington village to camps in lower Woodford Hollow in the mid-1890s. The new track reached the forks in 1898, where the hotel, inn, and dance hall were finished and the entire line once again ran under the name of the Bennington & Woodford Electric Railroad. But only a few months after the first excursion run to the forks, a flash flood washed out every bridge along the Roaring Brook from the Hollow to Bennington village. And along with the washed-out bridges went the fortunes of the trolley line and the Glastenbury Inn.

The return of logging to the forks in the 1950s resulted in the cellar holes of structures—including the boardinghouse/pavilion, sawmill, schoolhouse, etc.—being bulldozed (Charles Dewey to author, July 31, 1983). Only cellar hole remains that lie outside the immediate area of the forks (the east fork sawmill, the casino, and the kiln sites) can be found.

Most of the old right-of-way can still be hiked, some of it snaking its way out of Bennington, and here and there as it



6-21. The loggers' boardinghouse, which later became a hotel for vacationers at "the forks" in Glastenbury. The village schoolhouse is to the right, and railroad tracks head to the right and also up the far (west) draw to charcoal kilns, just out of sight around the curve (courtesy Tordis Isselhardt).

climbs up through Woodford Hollow to the forks. Much of the fill that makes up the track bed is slag, hauled from the blast furnace sites at East Bennington when the right-of-way was built. The slag can still be found in the track bed well up the hollow, miles from Furnace Grove. At the forks, the sites of the hotel, amusement hall, and schoolhouse have been back filled and leveled. Up the east fork are ruins of three charcoal kilns, and up the west fork are five ruins. A half-mile back down the trail at the head of an old railroad siding are five more kiln ruins. No tracks remain, having been pulled up for World War II scrap; but spikes, plates, and small sections of rail lie about in the underbrush and in the nearby brook. Fortunately, the scrap collectors forgot the kiln ruins, some of which still have their large iron bands and top vent hole castings.

The next valley west of Bolles Brook is Bickford Hollow. Where Bickford Hollow Brook passes from Glastenbury into Woodford there are three single-kiln sites, each on the west side of the brook and about a quarter-mile from each other. Farther downstream in Woodford Hollow, seven or eight kilns were operated by James Beckley, who ran blast furnaces at North Adams, Massachusetts and Chatham, New York (Aldrich 1889:478).

BE-37 Red Cabin Charcoal Kilns (Glastenbury): This site was found in 1982. The site is named for the red cabin located about 200 to 300 feet south of the charcoal kiln ruins. The five kiln ruins are in a generally north-south line, about 30 to 40 feet east off the old railroad bed.

The upper road joins the old railroad bed (main trail into this area) north of the kiln ruins. This upper road might have been a railroad spur, used to deliver cordwood and/or pick up charcoal. The road is a gradual climb from its northern junction with the main road. A piece of track was found protruding from brick rubble at the southern kiln ruin. Since the base of this kiln is many feet above the old (lower) railroad bed, it would more likely have worked its way downward from a higher place (the upper road bed?).

Between the upper road and the kiln ruins is a level strip,

slightly lower than the upper road, possibly an area to afford space for a charging bridge to charge the tops of the kilns.

Inside the ruins of the extreme southern kiln were two cast-iron pieces of a top vent hole lining found about 15 feet apart. They were dragged together and found to fit. The combined casting was about 5 feet in diameter, about an inch thick, and flared inward about 6 inches deep. There appeared to be another in the same ruin, buried upside down. There also were many variously dimensioned kiln-girdling iron bands that had been used to hold the kilns together around the middle and at the top. (All this hardware had disappeared when the site was revisited in 1991.)

A possible flume to the south of the ruins may be the site of a sawmill. On that side of the tributary to Bolles Brook, there is sufficient level space to have had a mill. No foundations could be found, but there appears to be a hint of a wheel pit near the downstream end of the flume.

The upper roadbed was searched for railroad artifacts but none were found. No complete piece of railroad tie could be found, so as to accurately determine the gauge of the track. The opposite side of the brook was inspected, and no charcoal or railroad-related features were found. An upside-down wreck of an automobile lies near the brook, just north of the culvert. Beverage cans and plastic containers give witness to the recreational activity of the area. A pothole is in the wall of the southern ruin.

BE-46 and BE-47 Charcoal Kilns at The Forks (Glastenbury): Ruins of the first three charcoal kilns at the forks (BE-46) were found in 1982 about a quarter-mile up the east fork of Bolles Brook. The kiln ruins have the normal amount of brickwork and hardware (bands, top hole lining), similar to BE-37, about a half-mile south. The scrap drives luckily forgot the kiln sites.

Five more charcoal kiln ruins (BE-47) were found about a half-mile up the west fork later the same day. The ruins are immediately downhill of the road leading up the west fork of Bolles Brook. The ruins appear in much the same condition



6-22. Charcoal kilns up the west draw at "the forks" in Glastenbury. Only circles of brick remain at this site today (courtesy Tordis Isselhardt).



6-23. Vacationers visiting a long-abandoned charcoal kiln up Bolles Brook in the Glastenbury-Woodford area sometime before World War I (Lester B. Nichols photo; courtesy Bennington Banner).

and hardware content as the east fork ruins.

By this time it was late in a long day spent thrashing through brush and water in the search for kiln remains, and many false kiln-appearing features were being encountered. Kiln ruins were being imagined everywhere. When the five ruins were finally found, they were seen in a hollow, looking down from a road high up the embankment. They were nearly ignored for looking too much like just another mirage.

BE-45 Bickford Hollow Charcoal Kilns (Woodford): These three single-kiln ruins were found in 1983 thanks to Charles Dewey of Bennington, retired lumber company owner who logged in and around the Bennington-Woodford area. He remembered seeing kiln ruins when logging the area many years before and guided us to the ruins.

The first ruin was found about an hour's hike up Bickford Hollow Brook from where it joins Bolles Brook. The second and third ruins are each a few minutes hike farther upstream from the first and from each other. All ruins are of brick and are on the uphill side of the trail, which follows the west side

of the brook. Each is also at the junction of an old road coming down from the mountain. The northernmost ruin may in fact be in Glastenbury; the woods are so heavy here that actual location as regards town lines is hard to determine. The ruins contain many 20- to 30-foot-diameter iron bands complete with adjustment hardware.

Bickford Hollow is a short hike up Harbor Road from Route 9 (Woodford Hollow) to the dam (right) and Bickford Hollow Road (left), following the older road northwest to the first crossing of Bickford Hollow Brook (no bridge). About a quarter-mile farther the trail recrosses to the west side. The first kiln ruin is a two- to three-minute walk upstream.

Woodford Area Charcoal Sites: Woodford City had two kilns operating in the 1890s by A. W. Hager (Aldrich 1889:480). J. J. Morehouse of Amenia, New York and E. C. White of New York City owned five kilns west of the village. Three kilns had a 40-cord capacity and two were 50-cords, all producing 12,000 to 15,000 bushels of charcoal a month. Harbour Brothers also operated kilns nearby, producing 25,000 bushels



6-24. A ca.-1900 view of a charcoal kiln and collier's house (?) reportedly in Woodford. This might have been one of the three single-kiln ruins found up Bickford Hollow in 1983 (courtesy Bill Gove).

a year. The Beckley & Adams Company, associated with a blast furnace at Chatham, New York, built six kilns in 1873, each with a 40-cord capacity. Later worked by Freeman S. Houghton of Bennington, the kilns made 10,000 to 12,000 bushels of charcoal per month (Child 1880:24-25). Exactly where in the Woodford area all these kilns were is unknown; most were probably very near Route 9. Inspection of both sides of the highway and up some nearby draws resulted in inconclusive finds; any surviving ruins were probably destroyed by highway widening and realignment.

Members of the Park family, some of the earliest settlers in Woodford, made charcoal for the nearby Bennington Iron Works. These kilns might have been the site of mounds found up Harmon Hill.

BE-57 Hager Hill Charcoal Kilns (Woodford): Sparse remains of charcoal kilns were found in 1984 alongside Route 9 in Woodford in the Hager Hill Road vicinity. The site was found after two hikes up Hager Hill Road (one nearly to Little Pond), but finally from information by local residents that led to Jesse Bugbee, who remembered the kilns being "very near to Route 9."

Some 100 feet off the highway in the Hager Hill Road some bits of red brick were found; adjacent to the north side of the road under heavy thorn bushes, whole bricks, some with burned ends, were found, along with bits of charcoal mixed into the very black soil, and an iron handle to a kiln door. No circles of brick were found; the immediate area was relatively flat. All these were found protruding out the southern edge of a low embankment that parallels the highway.

Local history reports charcoal made by A. W. and J. W. Hager in Woodford (Child 1880:n.p.). One of the Hager family was contacted and he remembered his father being somehow connected with the charcoal business.

BE-153 Harmon Hill Charcoal Mounds (Woodford): Re-

mains of up to a half-dozen charcoal mounds were found at about the 1,200-foot elevation, northwest of the peak of Harmon Hill in western Woodford. The mound remains were found as the result of logging in the area and were inspected by Dave Lacy and Shelley Hight, forest archeologists (Shelley Hight to author, July 2, 1990). The site of the mounds is in the vicinity of a woods trail that leads up a west nose near East Bennington and eventually joins the Long Trail about a mile east of the site. The mound site probably provided charcoal to ironworks at nearby Bennington and Woodford, and is representative of the many charcoal mound sites that exist in the vicinity and have yet to be found and documented.

Heartwellville Area Charcoal Sites: The 1856 Bennington County map indicates "coal kilns" at Heartwellville but repeated attempts to locate the site have failed. The kiln area has become a vast gravel quarry.

More coal kilns are indicated on the 1869 Beers map of Readsboro at three sites a few miles north of Heartwellville. Readsboro was densely forested and in nearly a straight line to North Adams 10 miles south; most of its charcoal found ready market at furnaces and foundries in that northern Massachusetts industrial city (Hemenway vol. 1 1867:220). The E. P. Hunt Company formed in 1868 at Heartwellville, operating a sawmill and making charcoal adjacent to the village along the Deerfield River. The kilns were conveyed to the Vermont Lumber and Coal Company in 1972. It continued to operate the kilns for a short time (Ross 1936:40). Charcoal making ended near Heartwellville by 1880 (Aldrich 1889:486).

Reinspection of kiln ruins previously found in the vicinity resulted in unearthing a conical kiln door, hinting that these also must have been conical kilns. Careful excavation of a wall section of one of these kilns proved fruitless because the bricks lay scattered all the way down through some 2 feet of debris. It looked as though the kiln had been dynamited.

Fieldwork at these interesting sites ended with the first snowfall in mid-November 1983. While digging without gloves alongside Grace in the cold, wet ground 100 feet west of Route 8 on a damp, overcast, bone-chilling day through alternating sunshine and blowing snow squalls, a state game officer drove by and spotted our unusual activity. He turned around and stopped, inspected the little excavation, and drove off, apparently satisfied we were not jacking deer.

BE-50 Heartwellville-Stone Charcoal Kiln (Readsboro): Finding this ruin in 1983 caused no small amount of excitement because it was the first stone-type kiln ruin encountered at that stage of this study. Dozens of stone-type ruins have since been located and recorded. The ruin was found while searching the area of other ruins. It measured 32 feet in diameter, making it one of the widest kilns found thus far in this study. Walls were 2½ feet thick and about 2 to 3 feet high. Vent holes had red brick in them. (The ruin bore a strong resemblance to a stone-type kiln found near the top of Berlin Mountain, southwest of Pownal in New York State. That kiln ruin is a few dozen feet off the Crestline Trail and has stone walls of similar thickness and height, but its floor is littered with brick.)

Inside, a small trench was dug into the floor down to outside ground level, 1½ feet deep and 2 feet back from the wall. Only small bits of red brick and stones were found, which raised the question of what happened to the material above the existing walls of the ruin. Speculation is that the missing material was brick and that the ruin's proximity to the highway and to Heartwellville made it an irresistible source of "free" brick. (In contrast, location of the lofty Berlin Mountain kiln in New York State was not conducive to removing quantities of brick.) If the material was stone, most likely it would still be collapsed inside the ruin. The brick scavengers obviously missed the few bricks still in the vent holes.

The ruin is a few dozen feet east off Route 8, about a mile north of the Route 8 and 100 intersection at Heartwellville. It sits on a narrow piece of ground between the brook and a low rise, into which the ruin is slightly cut, and is one of three indicated on the 1869 Beers map of Readsboro as "coal kiln."

BE-51 Heartwellville-Brick Charcoal Kilns (Readsboro): Remains of two brick-type kilns were found in 1983 about a mile south of the Searsburg-Readsboro town line. One is about 100 feet northwest of the large culvert at the pull-off; the other is about 500 feet south of the culvert on the opposite side of the highway. These are the approximate places indicated as "coal kiln" on the 1869 Beers map of Readsboro.

The upper remain is a scattered circle of brick across the brook and cut into the embankment. Lining the bottom of the embankment is a 2- to 3-foot-high stone wall. Much red brick also protrudes from the opposite bank of the stream from the kiln remain.

Shallow digging between the back of the kiln and the stone retaining wall uncovered an iron kiln door, similar in shape to kiln door openings seen at conical kilns in Wassauc, New York. This raised speculation that the remain might be that of a conical kiln (a confirmed conical kiln was found later across the highway; see BE-52 following). Excavation into the foundation of the remains failed to confirm any conical configuration of the walls since the bricks were jumbled down to their foundation stones.

The remains of the second kiln, farther south along the highway, are immediately adjacent to and cut into by the highway. Kiln brick at this site was also scattered such that exact edges of the remain were difficult to determine. This site is also cut into the side of a low hill.

BE-52 Heartwellville-Conical Charcoal Kiln (Readsboro): The same day, after finding the previous kiln remains, a search was made in the general area for any undocumented ruins, wood roads, or anything that might shed light on the ruins that were found. In the process, a flat, circular feature was discovered, cut slightly into a low rise about 300 feet northeast from the culvert and parking area adjacent to BE-51. Troweling into the ground revealed a circle of red brick, and digging deeper revealed that each successive layer of brick had been laid about an inch outward from the one above. A conical kiln ruin had been found and confirmed in Vermont!

No known documentation references this specific kiln, although a conical kiln is documented at Readsboro (Egleston May 1879:393). This ruin, unlike the three others nearby, probably dates to post-1869 because it is not indicated on the Beers map. In his paper on conical kilns, Egleston described the one in Readsboro to be 28½ feet inside diameter at the base. This kiln ruin measured 30½ feet in diameter at the base. But the wall thickness agrees, as does his sketch, which shows a row of vent holes at the base. In the excavated section, a brick-size vent hole was uncovered in the second tier of brick from the bottom. A 1-foot-diameter test hole near the center of the ruin reached the kiln floor through 2 feet of brick, burnt pitch, and charcoal. Since the base diameters disagreed, BE-51 (where a conical-type kiln door had been found nearby) was rechecked with no positive results; the walls have been too badly disturbed.

The year after the site was found it was inspected by U.S. Forest Service personnel because this forest tract had logging potential. Personnel included the forest supervisor, a Forest Service soil expert, forest archeologist Billee Hoornebeck, and a local state forester who hunted and fished the area for many years and had never noticed anything here (he knew of the other obvious ruins nearby). Puzzled, he asked Billee how anyone could find undocumented remains hidden under all that surface growth and dead leaves. Billee's answer was simply that archeologists are gifted with "finding things in places that most others see nothing at all." We are not sure if the old forester ever understood.

County Road Area Charcoal Sites: Two Massachusetts iron-works, the Ames Company of North Adams and the Richmond Iron Works of Richmond, made 20,000 bushels of charcoal a month in 14 kilns in the Stamford area. Ames owned 2,500 acres of woodland and employed 30 woodcutters and colliers (Child 1880:203). The exact locations of these kiln sites are unknown but fieldwork in the County Road section near the Pownal-Stamford line hints at this area.

The Richmond Iron Works was a major iron furnace operation near Pittsfield, Massachusetts, which by this period of time employed 700 people at its furnaces, mines, and the charcoal kilns. The company also owned furnaces at Cheshire and Great Barrington, Massachusetts, and as many as 28 tracts of land as far away as Stamford and Woodford, Vermont. Its landholdings as of 1870 are recorded in the *Doomsday Book*, on file in Pittsfield at the Berkshire County, Massachusetts, Registry of

Deeds. One 3,500-acre tract in Stamford includes 31 plots, mostly in the north-central and northeast parts of town. Ames Company holdings are indicated bordering to the west along with plots owned by other charcoal makers. The Richmond Iron Works' landholdings in the northeast corner of town border with an additional 4,520 acres (38 plots) in the southeast corner of Woodford. The company essentially owned the equivalent area of a whole Vermont township.

Rob Woolmington of Bennington, one-time avid hunter of charcoal kiln ruins in that area, found some stone-type kiln ruins near Roaring Brook (known locally as Coal Kiln Brook) in the 1970s. Two similar kilns were found two miles to the southeast in Gully Brook with walls 9 feet high. According to local tradition there are many more undiscovered kiln ruins in Stamford and Pownal, possibly on the northeast slope of a nearby mountain called The Dome. Charcoal was also made in Stamford village at a chemical works that operated there. Remains of mound-type kilns were found near the end of Maltese Road, and about a half-mile up Coal Kiln Road near Cardinal Brook, four brick-type kiln ruins were found.

The photo introducing chapter 5 shows three unidentified,

operating, century-old, conical-shaped charcoal kilns. The kilns' 5-foot-high bases are made of stone; brick continues the structure upward, in conical shape, nearly to a point at the top. These three kilns, which might be those at Crazy John Stream (BE-107), show what Green Mountain stone-and-brick conical charcoal kilns looked like in their day.

BE-53 Cotykilns/Haskins Kilns (Stamford): They are called Cotykilns (or Coty kilns) because Peter Coty operated them and transported the charcoal by horse and wagon to North Adams, Massachusetts, about 10 miles south (Woolmington July 7, 1977:17-20). They were found in 1984, with help from Bob Neville of Clarksburg, Massachusetts, about two miles north of County Road along an old section of Long Trail.

The four stone-type ruins were in fair to good condition, ranging from fully collapsed to having walls up to 8 feet high, and stand in a row a dozen feet downstream from the Roaring Branch trail crossing. Mortar and cement were used to seal the walls and bricks to control the vents. Additionally, the inside walls were coated with as much as an inch-thick layer of burnt pitch, which must have aided in keeping the kiln walls airtight. The main kiln openings faced on the brook. Hardware found



6-25. Three of the four charcoal kilns north of Old County Road in Stamford, photographed near the turn of the century and about 50 years after the kilns had gone out of business. Notice tipped-over charcoal cart at left (courtesy Eugene Farley, Andrew C. Rumgay, and The Transcript, North Adams, Mass.).



6-26. Another view of the charcoal kilns north of Old County Road, showing wood tracks on which the charcoal cart ran (courtesy Eugene Farley, Andrew C. Rungay, and *The Transcript*, North Adams, Mass.).

was one shovel and a 66- by 80-inch iron kiln door (both reburied in situ).

These might also be the so-called Haskins kilns (Haun March 30, 1966). The 1869 Beers map of Stamford shows Haskins' sawmill about halfway between the kiln site and County Road, near what was then called Broad Brook. This part of the mountain was called Scrub Hill. Stone walls and some brickwork indicate the possible sawmill site. A photo of the kilns shows complete stone construction, in three stages. The lower stone wall rises with only a slight inward pitch about half the height (6 to 8 feet). The next section of wall dips inward more steeply to about three-quarters of the height. The final section is a roof, rising about another 3 to 4 feet in a concave configuration. A wide iron band girdles the kiln at the beginning of this roof section, probably to counteract the outward forces here. A relative of one of the charcoal workers connected with this site

was contacted in North Adams, but no response to a request for further information was received.

BE-55 Gully Brook Charcoal Kilns (Stamford): With the help of Bob Neville's directions, kiln ruins were found just a few minutes walk north of County Road. Up the trail alongside the east branch of Cowan Brook (locally known as Gully Brook) are the ruins of two partially standing stone-type kilns. The walls of one ruin were 9 feet high and the top took on a beehive shape. Few bricks were found inside this ruin; more were found inside the other.

The site is just west of Klondike Road and this section of County Road is drivable only in dry summer weather. It is easiest accessed from the Stamford side (upper Mill Road). My first drive up County Road was from the Pownal side in the late spring and some brooks were still overflowing the road in places. Two men in a four-wheeler grinding their way down

the same road were taken by surprise at the sight of this strictly flatlander's car, feeling its way up the narrow, muddy mountain road, and weaving around boulders, fallen trees, and pond-size puddles.

An interesting feature of these kilns is their vent holes. Similar to the cast-iron vent hole linings found at Dragon Brook in Ripton, these Stamford kilns also had preformed vent holes, but made of tile. Although the inside ends of the vents were partly blocked with a thick layer of burnt pitch, the outside ends still permitted the full length of a brick to be inserted, effectively closing the vents just as it did when the kilns were in operation.

BE-106 Cardinal Brook Charcoal Kilns (Stamford): The remains of four brick-type charcoal kilns were found in 1986, about a half-mile up the Roaring Brook road from County Road. The unmaintained rough road is locally known as Coal Kiln Road. The ruins were found a one-minute walk after the Cardinal Brook bridge, immediately east (right) off the road. (Some local residents claim that the USGS Stamford topographic map is incorrect, that what the map identifies as Cardinal Brook is in fact Nunge Brook.)

Information leading to location of the kiln remains was provided by Ira and Anna Whitney, long-time Stamford residents I had visited earlier in the day. Mr. Whitney said that the site was obvious from the charcoal that ran down the embankment onto the road, but that nothing remained of the kilns themselves.

The embankment at the side of the road was indeed black with charcoal spilling down from the kiln site. Also visible in the road, as the site was approached from the downstream side, were numbers of red bricks. These are the only all-brick-constructed charcoal kilns found thus far in Stamford; all others found have been at least partly stone-built.

The kiln remains lie in a row, north to south, parallel to and about 15 feet east of the road. The northernmost ruin is on a slightly raised elevation from the other three, making it about level with the adjacent road. As the road drops off downhill and the ruins remain level, the southernmost kiln site ends up atop a 7-foot-high embankment. The hill behind the kilns appears cut into and remains of a low stone wall can be seen at the top of this charging hill, which probably supported platforms from which to gain access to the tops of the kilns. The hill behind the kilns is flat, but soon drops off on the other side (east) into Roaring Brook.

Much brick lies scattered about the site; no kiln walls remained intact. But the circles of the brick where the walls once stood could be made out, measuring approximately 28 feet in diameter. The three northernmost kiln remains are the most obvious. The southernmost is not as obvious since the remains of some of its southern and southwestern walls have eroded downhill. No iron hardware was found. In the process of inspecting the area for hardware and any associated features, some brick and charcoal were found immediately across the road, but appear to have been pushed there by some road-grading operation. Much brick also is scattered in the streambed for about 100 feet downstream.

Uphill is a small clearing with an adjoining logging road curving through it, dropping off to cross Roaring Brook on the other side of the hill. This area appears to have been associated with a recent logging operation from the depth of the wheel

tracks and amount of slash, tree bark, and sawdust. Signs of logging could be seen on that side (east) of the brook. Where the road drops downward to the brook, however, there is a high concentration of charcoal and brick. The road appears to have been cut directly through the charcoal and brick deposit. Inspection of the area revealed no charcoal kiln ruin although one might have existed here before getting plowed under by logging operations.

This mile stretch of Coal Kiln Road from its juncture with County Road a half-mile south uphill to the power lines (not shown on the USGS maps but are on the U.S. Forest Service maps) is a high-development area. During the afternoon spent at and around the kiln site, a number of overland vehicles churned up and down the road with agents and prospective buyers apparently inspecting building plots.

BE-108 Thompson Farm Charcoal Mounds (Stamford): Sites of two charcoal mounds were found on the Thompson farm in 1986. Information leading to location of this site was provided in part by Anna Whitney of Stamford, who lived on the farm as a little girl and related how she used to play on a patch of charcoal-covered ground; by Sandra Thompson, who told me of a recent visit to her farm by Mrs. Whitney and pointed to the north-northwest where she used to play in the charcoal; and also Nancy Bushika, librarian at the Stamford Community Library, who contacted Mrs. Thompson and relayed pertinent information to me.

The Thompson farm is located near the end of Maltese Road, which heads north off County Road about two miles northwest of Stamford village. A few dozen feet beyond the Thompson house, the remains of a continuation of the road can be seen going up the hill, eventually intersecting with another, more obvious, "old logging road." The charcoal-making areas are located up (north) this road about a quarter-mile, and generally fit the directions to the site as provided. Accompanying me on the search, location, and inspection of the site was 11-year-old Hawk Thompson.

The charcoal-making area was found to contain two mound-type remains. One mound remain is about 30 feet in diameter, slightly larger and more round than the other. The 1-foot-high concrete wall of an abandoned well is just southwest of the site. Physical confirmation of the site beyond the circular flat area on the slight incline was made by digging two shallow holes at each mound site with a trowel. Black soil and bits of peach-pit-size charcoal were found at both sites without digging deeper than 6 inches. Areas between and around the sites were also tested but with negative results, isolating charcoal finds to the mound sites proper. Walkover inspection was made in the surrounding area with no further finds, although many old roads in the area were not hiked to their limits. Due to the hunting season, we decided not to venture too far away from the farm and into the woods.

Dutch Hill Area Charcoal Sites: The 1856 Bennington County map indicates "coal kilns" by today's Route 8, just downhill from the old Dutch Hill ski area south of Heartwellville, at a roadside spring. And a Sunday afternoon tour of kiln ruins in the area, organized by Nancy Bushika of the Stamford Community Library, resulted in finding a kiln ruin behind Hank Kennedy's house, east of the highway, and more ruins up Collins Road near the upper end of Crazy John

Stream. The informal tour included Stamford residents Betty Vadnais, Irving (Red) Call and the late Betty Call, and Pat Rondeau with her little boy (plus Nancy Bushika and Bob West). The kiln on Hank Kennedy's property was known by the local people; Mr. Kennedy guided us to the ruin. The kiln ruins up Crazy John Stream were known by Pat Rondeau, who guided us to them, a lot less leisurely hike than the stroll to Mr. Kennedy's kiln ruin.

BE-105 Kennedy Charcoal Kiln (Stamford): This single-kiln ruin was found in 1986 about a 15-minute hike east of the Kennedy house and barn, east of Route 8, and probably within about a hundred feet of the Readsboro town line (farther to the east). The ruin measured 82 feet around the outside. It has approximately 2-foot-thick by up to 89-inch-high stone walls. Pieces of charcoal and pitch rest inside on the kiln floor along with many pieces of red brick, too many to have all been used for vents, indicating that the kiln might have had a dome-shaped brick roof. Vents in the kiln wall were made in many cases with two bricks between two large, flat stones, above and below, with space between the bricks to admit another brick for draft control. No hardware was found in or around the ruin or the nearby brook. The hint of a road could be seen leading from the ruin back toward the Kennedy house; a short way from the ruin, it joins a better-defined trail.

Mr. Kennedy said he thought that a family named McGraw owned and operated the kiln, although that name does not appear in the 1869 Beers map of Stamford. The ruin falls within the area owned/leased by the Richmond Iron Works (Massachusetts) in 1870 (*Doomsday Book* 1870:26). The company operated nine charcoal kilns in Stamford, making 5,000 bushels of charcoal per month (Child 1880:203).

BE-107 Crazy John Stream Charcoal Kilns (Stamford): The ruins of three stone-type kilns were found about 1¼ miles up Collins Road in Stamford. The road to the site is twisting and uphill most of the way, but on that day rewarded us at various intervals with large, ripe blackberries. The kiln ruins are off a side trail to the right that rejoins the main trail a short distance uphill.

The ruins are in a very advanced stage of collapse, making accurate measurements difficult. Inside diameter is 24 to 26 feet; inside wall height is about 5 feet. Walls are made of stone, about 2 feet thick. The ruins lie in an approximately northeast-southwest line, 10 and 20 feet apart. Much charcoal, burnt pitch, and pieces of red brick lie mixed inside the kiln area along with stone wall breakdown. The amount of red brick may indicate the kilns had dome-shaped brick roofs. Could this three-ruin site with kiln bases of stone and probably tops of brick possibly be those in the photo that introduces chapter 5?

Inspection of the kiln walls indicated ground-level openings faced the trail. The only hardware found was a flat iron bar woven into roots of a birch tree on the northerly wall of the center ruin. The iron rod appears similar to hardware seen on parts of iron doors at other charcoal kiln sites.

The kiln site lies within the area owned or leased by the Richmond Iron Works during 1870–1880 as a source of charcoal for its furnace at Richmond, Massachusetts (*Doomsday Book* 1870:26). The company operated nine charcoal kilns in Stamford, making 5,000 bushels of charcoal a month (Child 1880:203).

BE-54 Dutch Hill Charcoal Kilns (Readsboro): Alongside a spring that Route 8 travelers have been drawing water from for years are the collapsed remains of two charcoal kilns. The site is identified on the 1856 Bennington County map as "coal kilns," astride the Stamford-Readsboro town line. But the actual site is a bit west of the line, well in Readsboro.

When found in 1984, all there was to identify the kiln remains were some bits of charcoal, some red brick, and one large stone with a burnt, blackened end, all from a small 20- by 40-foot area between the highway and a cut-into embankment. The site is buried under an estimated 6 feet of gravel fill, which was probably done at the time of highway realignment. The area is large enough to have contained two kilns (the map indicated "kilns"). Directly across the highway are more red brick and charcoal.

BE-CK03 Root & Jones Chemical Company (Bennington Village): In Bennington village, the 1875 chemical works of Root & Jones produced charcoal as a by-product of wood distillation. From the 150 cords of wood consumed monthly in their ovens, they extracted 225 pounds of lime, 4 gallons of alcohol, 12 to 15 gallons of tar, and 40 to 50 bushels of charcoal per cord of wood (Child 1880:95-96).

WINDHAM COUNTY

WD-66 Harold Field Charcoal Kiln (Stratton): The standing remains of a concrete-block charcoal kiln were located in Stratton in 1986 based on information from Bob West's uncle. He said that on Pike's Falls Road, at the Stratton-Winhall line, a charcoal kiln could be seen standing alongside the road. The ruin was found on the second try.

The structure stands about 60 feet off the west side of Pike's Falls Road in a pine forest, about 850 feet south of the Winhall-Stratton town line. It is visible from the road only if you know exactly where and when to look. The ruin is made of modern, standard-size concrete block. It stands 8 feet high, 12 feet long, and 7 feet wide. A short chimney made of more standard chimney block is at the rear of the kiln. The front opening is 4 feet wide, and the roof made of a 4- by 8- by 16-inch concrete block, held up in position by iron pipes horizontally run in parallel through the holes of the blocks, with the blocks snugged against each other across the roof. All blocks in the roof, walls, and chimney are mortared. The entire structure is constructed on a concrete slab that extends an undetermined distance into the ground (at least 6 inches, as can be seen at one corner). Vents are provided at the corners by poking through two adjacent holes in each pair of diagonally opposing corner blocks. Vent control is by bricks placed in the holes. The kiln, as found, was about 20 percent filled with charcoal.

A local resident said that the property owner lived somewhere in Wisconsin and that the kiln was built sometime about the middle to late 1950s by Harold Field. The kiln design and period of estimated operation generally agree with the description of the mid-20th-century revival of charcoal burning for the backyard barbecue market (Simmons April-May 1960:10-12). Many small cinder block charcoal kilns were built and operated during and following World War II, their construction encouraged by bulletins and booklets published by various state resource agencies. And many modern, industrious charcoal

burners did manage to put away profits against small financial investments, but with a lot of hard work and patience. People living near Field's charcoal kiln said that he apparently thought he'd found an easy way to get rich quickly, but after making only one load he quit, moved to Colorado, and has not been seen or heard from since.

Summary of Results

The quantity of kiln ruins and the variation of their design and construction material indicate that charcoal manufacture was a major 19th-century Vermont industry. The charcoal not only fueled local furnaces, bloomeries, and foundries, but after the demise of the Vermont iron industry in the mid-19th century, it found markets in Massachusetts and Connecticut, and possibly New York and New Hampshire. Charcoal also found markets in Vermont copper-smelting operations at Strafford and Vershire, iron and brass foundries that dealt with metals requiring special qualities, and glass foundries. A summary of charcoal-making sites and types of remains found in Vermont is presented in table 6-2.

Table 6-2. Summary of Charcoal-Making Sites and Types of Remains

County	Sites	Brick	Stone	Brick/ Stone	Concrete	Mound
Addison	13	7		1		18
Bennington	38	53	8	11		11
Caledonia	1					
Chittenden	1					2
Orange	2					
Rutland	13	48	1			20
Washington	1					
Windham	1				1	
Windsor	1					
Total:	71	108	9	12	1	51

Anyone familiar with Vermont's landscape is aware of the rocky nature of the land. Vermont is still known for its marble, slate, and granite industries, but Vermont farmers would rather forget the miles of stone walls they have built down through the 200-year history of the state. Stone-built furnaces and kilns reflect, therefore, the adaptive use of a natural resource to answer a need for a practical building material. The stone-type kilns are built of unfinished stone, but are laid up carefully in up to 3-foot-thick walls to prevent as much air as possible from leaking into the interior of the kiln during the combustion process. Most brick-type kiln ruins have long since been cannibalized of their useful brick and hardware. Stone is such an available resource in Vermont that the best charcoal kiln (and lime kiln) ruins in the state are those made of stone.

The variability of 19th-century charcoal kiln ruins in Vermont reflects, therefore, the ability of charcoal makers to adapt the needs of the basic kiln design to the resources that were available. The consistent 28-foot inside diameter of the brick-type kilns, for example, indicates a common knowledge of one aspect of the technology. But the variability in hardware at these same brick-type kiln sites testifies to the individuality of at least one of the number of choices that enterprising Vermont charcoal makers appeared to make the most of.



A partially standing lime kiln ruin near Cavendish Station, showing advanced breakdown of the front arch and the iron binding holding together what remains.