

Chapter 8

Study of Lime Kilns

Study Methodology

The study of lime kiln ruins and sites in Vermont started with the inspection of a ruin in Leicester Junction in 1984, where attention was directed by a friend who claimed that large blast furnace ruins were to be seen. Inspection confirmed suspicions that the ruin was that of a lime kiln, not a blast furnace. But the physical similarities between blast furnaces and some early commercial lime kilns encouraged further archival research and field inspection of the latter.

Information regarding location of lime kiln ruins and remains came from maps, archival references, and informants. A few kiln ruins were found by chance. Maps include the 1854–1859 series county wall maps, which indicate lime kilns presumed active or recently active at time of publication. Likewise, some 1869–1878 Beers maps also indicate lime kilns. The Doll geology map shows various limestone outcrops, which indicate areas of probability for finding limestone quarries, but was not detailed enough to provide specific surface information for finding lime kiln ruins.

The Vermont lime business has received minimal recognition in many local histories written in the 19th century. Incredibly little beyond a few words has been written about availability of limestone in the state. At best, a few histories make a statement or two alluding to lime burning at some obscure time in the past. It was not until the merits of using lime as an agricultural additive were recognized that lime burning in Vermont took on an “industrial” stance and histories written in the late 19th century reflected this. State geology reports during and after that period also included much information on the economics of the lime industry. They reported on locations of quality limestone, annual production capacities of lime works, and regional and national trends of the industry.

Archival material included state, town, and county histories and business journals. Of special help were the 1861 *Report on the Geology of Vermont* by Hitchcock et al., the 1899 through 1934 biennial reports of the State Geologist by George H. Perkins, and the 1915 U.S. Geological Survey Bulletin on the geology of Vermont dolomite and marble by T. Nelson Dale. The latter included small detailed maps of quarries discussed in the text, which greatly facilitated the search for lime kiln sites.

While using the Dale material to find the kiln ruins in the field, it was noticed that some of the descriptions referred specifically to a lime kiln in the vicinity of a quarry, but other references were merely to lime having been burned in the vicinity at one time. Field work resulted in finding ruins at 13 of 14 sites (93 percent) at which lime kilns had been specifically referenced, but at only 4 of 7 sites (57 percent) at which only vague references were made of lime burning. It is not known whether Dale could not find some of the kilns or perhaps did not intend to accurately reference kiln ruins; the reports were mainly about the geology of the state’s marble industry and not about the manufacture of lime. This could mean that lime kilns might have also operated at some of the many marble

quarries he discussed (and maybe at some quarries he did not discuss) but at which no mention of lime burning or lime kilns was made. Information from Dale got us into the vicinity of a kiln but it usually took local inquiry and hours of bushwhacking to get us exactly to the kiln ruin.

Informants included friends, property owners, and those who gave directions or shared thoughts on the subject along the way. Some knew only where a suspicious pile of stones was to be found; others knew a lime kiln ruin when they saw one and were specific with directions and descriptions. Most property owners and local residents were very generous with their time and knowledge of where things were and what they knew of them. Many were surprised that anyone was interested at all in “that old pile of stones.”

Chance finds were also made, such as discovering Lime Kiln Road in Charlotte while driving up Route 7 one Sunday afternoon, or Arnold Kingsley’s directions to a lime kiln in his Whitingham pasture instead of the one being sought farther down the road. Although not a common occurrence, a few kiln ruins were discovered while driving by or just by having glanced in that direction at the right moment. There was also much useless stopping and hiking into pastures and fields to check out suspicious-looking mounds of stones or clumps of white birch. Many ruins still lie out there along sides of roads and trails, however, waiting to be discovered and interpreted.

Finding a kiln ruin in the field, even with good archival reference to its existence and indication on a 19th-century map, was not easy. The best time of year for field work was, of course, before or after foliage season. Each was not without its hazards, however. In mid-spring there was still cold surface water and mud to be dealt with; snow and ice at higher elevations. In the post-foliage season shot and arrows were flying about, and some of the smaller ruins and features were obscured by fallen leaves.

Farm-type kilns were usually found at the base of a hill, sometimes just below a limestone outcrop. Attention was paid to ledges in suspected areas and also for indications of former roadbeds that preceded present roads, alongside which the lime kilns would have been operating.

The dividing line used in differentiating between early and later commercial ruins was the use of firebrick. Large kiln ruins near extensive quarries were obviously not farm kilns but more of a commercial operation, and these ruins, in which internal lining is made of stone, are in the early commercial (1850s–1900s) category. Those in which firebricks were found are in the later commercial (1870s–1920s) category. The presence of firebrick is taken to indicate a definite technological step forward.

Their markings indicated that most firebricks probably came from Troy, New York. A common firebrick mark was McL&H CO TROY NY, which was McLeod & Henry Company, manufacturer of stove linings and firebrick. The company was founded by Jacob Henry in 1871; Bacon & Henry succeeded him, and in turn were succeeded by Harvey S. McLeod in

200 Years of Soot and Sweat

1882. McLeod & Henry Company was founded February 1, 1887. Bussey & McLeod also cast stoves in that same period (Anderson 1897:313). Correlating firebrick markings with firebrick manufacturers can provide valuable kiln operating dates. Other firebrick marks found associated with ca.-1880s to -1920s lime kiln ruins were: H. W. SPEC; BOSTON [FIRE?] BLOCK CO; U.S.A.; and BRANDON VT. Among the tons of firebricks lying around the razed lime works at Winooski Park are firebricks marked LEHIGH, BESSEMER, POWER, TYRONS, D-TYRONS, and ALUSITE 81. Some of these firebricks are quite large, on the order of a cubic foot. Some red bricks found at many sites were identified DRURY (of Essex Junction); many, however, contained no markings at all.

Another indication of technological progress at kiln sites was the use of binders to stabilize the stack and keep the stonework together. Most common bindings were one-inch-diameter iron rods, threaded at ends that protruded out the walls. The rod ends had large nuts screwed on with washers that snugged the assembly against the kiln walls. At some collapsed ruins, the internal lateral crisscross pattern of these binders was revealed once the tangle of bent and intertwined hardware was figured out. At the Lyman-Martell ruin in New Haven (AD-494), a double set of bindings across the outside wall of the kiln was reinforced by a flat iron plate bolted to the rods. Nowhere did the strength of the lime kiln binding approach that of binding used at blast furnaces, however, which were much more massive in size.

Kiln ruins were anything from a 20-foot-square stone base with 25-foot-high iron shells (AD-355) to a barely distinguishable grass-covered stone mound in a pasture (WN-124). Depending on which direction a ruin was approached, it could appear to be no more than a hole in the ground from the uphill side, or an entrance to a crypt or stone chamber from the downhill or front side. One stone feature initially taken for a lime kiln ruin turned out to be an abandoned stone-lined cistern (BE-LK07).

The general configuration and character of the ruin differentiated it from, for example, a charcoal kiln or blast furnace, as did the presence of burnt lime in the form of a gray-white grainy powder or small, cracked, white stones in the direct vicinity of the kiln ruin. Because the bottom opening in the front wall of the kiln created a built-in weakness, the front walls of many early ruins were found collapsed and their stonework slumped outward to the ground, hiding any burnt lime in this area and giving the ruin a random stone mound appearance. At Scotch Hill (RU-98), moving a few stones from a collapsed front wall during a reinspection of this previously unidentified ruin exposed a hidden archway, confirming its past use as a lime kiln.

While studying lime kiln ruins, finding limestone and marble quarries was inevitable. Quarries that provided stone for the earlier lime kilns were small, appearing in many cases no more than natural outcrops. They were sometimes overgrown in summer and required some effort to find. A few were reputed by owners or local residents to be infested with rattlesnakes.

Quarries that provided stone for lime kilns (and marble) operating after the mid-19th century have left significant scars on the landscape. In most cases, the remains of ironworks and charcoal kilns left little physical disturbance to the landscape.

Soil erosion and vegetation quickly re-covered ground lost to furnace mounds, ore pits, and kiln remains. Forests cut for cordwood consumed in charcoal and lime kilns renewed themselves in a few dozen years. But quarry operations, whether slate, granite, or marble, by their nature have left gaping holes in the ground. Like railroad cuts still visible along long since abandoned rights-of-way, quarries will remain forever to remind the explorer what the 19th and 20th century did to the landscape.

Results of the Lime Kiln Study

Seventy-one kiln sites were reported to the State Archeologist during the 1984–1992 period of the overall statewide IA study of lime kilns and are now part of the State Archeological Inventory. These sites contained 93 fully or partially standing ruins or mounds (something visible on the surface). Twenty-nine sites were found within the new proclamation boundaries of the Green Mountain National Forest. Visible ruins include 71 made of stone, 13 of a combination stone and concrete, and 9 made of concrete. Thirteen stone and/or concrete types displayed remains of their tall iron shells in various stages of deterioration. Forty-three kilns probably operated at one time with iron shells.

An additional 14 sites at which inconclusive or no positive surface evidence was found but subsurface material might exist were also reported in the Field Site (FS) category. Archival and field work continues at 33 more sites in the work-in-progress (LK) category. The total number of lime kiln sites studied is 118 at this writing; 160 lime kilns are estimated through archival work to have operated in the state.

Lime kiln ruins were generally found associated with limestone outcrops or quarries. Although the earlier primitive farm-type lime kilns were usually found well away from the nearest farmhouse, almost all later commercial-type lime kiln ruins were found near roads, highways, and railroads. Farm-type ruins were the smallest type found; commercial-type ranged from much larger round shapes to imposing square structures, some with their rusting iron stacks wholly or in part above stone and/or concrete bases. One lime kiln site was found associated with an early-20th-century calcium carbide plant.

Many lime kilns were built of stone from the same quarry where they obtained stone to burn. Although appearing to be a peculiar practice, the insides of these kilns soon glazed over from the heat of burning, which protected the walls from further heat effects. The glaze also sealed the kiln from outside drafts, keeping the heat inside and reducing fuel consumption. At some ruins, the glaze was observed as being all that remained to hold small sections of inside walls intact, long after major sections of the outside walls had collapsed. Concrete kilns and combination stone-and-concrete kilns were those usually found associated with firebrick, although two stone-built kiln ruins were also found with firebrick. All combination stone-and-concrete kilns were the base for iron shells.

Lime kiln ruins were generally round or square. Some kiln ruins were built into a hillside or slight rise and their front side (that is, the opening side) was faced with a stone wall. This wall was as high as the kiln and extended up to 20 feet on either side to act as a retaining wall to support the work area

Table 8-1. Lime Kiln Sites

Site No.	Principal Name	Kilns per Site	Type	Green Mountain National Forest
<u>Addison County</u>				
AD-318	Huntley	2	Stone/Concrete*	No
AD-355	Green Mountain Lime Company	5	Stone/Concrete*	No
AD-409	Bristol	1	Stone	No
AD-494	Lyman-Martell	2	Stone	No
AD-FS95	Powers Lime Works	1	Stone?	No
AD-FS96	Swinington	3	Stone/Concrete*?	No
AD-FS97	Plank Road	1?	Stone?	No
AD-LK01	Quarry Road	1	Stone?	No
AD-LK02	Marsh	1?	Stone?	Yes
AD-LK03	Chaffee	1?	Stone?	Yes
AD-LK04	Peake	1?	Stone?	No
AD-LK05	Gibbs	1?	Stone?	No
<u>Bennington County</u>				
BE-109	Barnumville	1	Stone	Yes
BE-117	Manchester Depot	1?	Stone?	Yes
BE-118	Pownal Lime Company	1?	Stone/Concrete*?	Yes
BE-141	North Dorset	1	Stone	Yes
BE-144	Judson-Howell	1	Stone	Yes
BE-192	Martin	1	Stone	Yes
BE-FS7	Amaden & Son	1?	Stone?	Yes
BE-LK01	North Pownal	1?	Stone?	Yes
BE-LK02	Dorset Mountain Road	1?	Stone?	Yes
BE-LK03	Purdy Hill	1?	Stone?	Yes
BE-LK04	Hopper Brook	1?	Stone?	Yes
BE-LK05	Equinox Mountain	1?	Stone?	Yes
BE-LK06	Readsboro	1?	Stone?	Yes
BE-LK07	Red Mountain	1?	Stone?	Yes
BE-LK08	Lawrence	1?	Stone?	Yes
<u>Caledonia County</u>				
CA-LK01	Marl Pond	1?	Stone?	No
<u>Chittenden County</u>				
CH-282	Weston Lime Works	2?	Concrete?	No
CH-284	Champlain Valley Lime Company	4	Concrete*	No
CH-365	Laberge	1	Stone	No
CH-FS118	Bates	1?	Stone?	No
CH-LK01	Stave Point	1?	Stone?	No
<u>Franklin County</u>				
FR-178	Fonda Junction	6	Stone/Concrete*	No
FR-179	Joyal	1	Stone	No
FR-224	Missisquoi Lime Company	1	Stone	No
FR-225	Missisquoi Lime Works Incorporated	5	Stone(*?)	No
		2	Concrete(*?)	No
FR-226	Bancroft	1	Stone?	No
FR-227	Richford	1	Stone	No

At the south end of the tramway is the quarry, where the tramway gently slopes downward to ground level and the remains of a road continues the gentle downward slope into the quarry. The road proceeds into the quarry through a cut in the bedrock, then curves westerly and downward at a gentle slope to the floor of the quarry. The many small trees growing on the floor of the quarry indicate the number of years since abandonment; the quarry is not as wide or deep as those on the Colchester side of the river.

The top of the tramway is wide enough for carts to have been horse-drawn from the quarry to the lime kiln indicated by the Beers map as near its northern end. No surface remains of the lime kiln could be found at the north end of the tramway. A few dozen feet east, however, there is a wide, deep depression near the bottom of which are pieces of concrete abutments, recent trash, and some burned lime. A dozen feet southeast of the depression is a concrete foundation of undetermined use. The wide, north end of the depression drops off to the Winooski River; directly across the river are visible the remains of the

lime kilns that operated on that side. Considering the location of this depression nearly adjacent to where the lime kiln stood at the northern end of the tramway, could burned lime have been carted from the bottom of the kiln to a structure that stood in this depression, and then transported across the river by cable and cart arrangement to the railroad on the other side?

Southwest of the southern end of the tramway are some large stones that at first inspection appear to be foundation walls. But any pattern to the stones' placement seems to have been caused by their having been pushed or bulldozed. Truckloads of trash and earth have also been dumped in the proximity so that the stones may have been dumped here from someplace else and have no connection with the kiln operations. Just north of the stones and between them and the roadside parking area is a 35-foot-diameter concentration of white birch, but surface inspection and shallow testing failed to reveal any charcoal deposits.

Southeast of the tramway are pieces of glazed stone and red brick that appear similar to lime kiln lining material seen at other lime kilns in Vermont. The material is in about 6-foot-diameter surface concentrations, lying here and there in this area. No kiln foundations were found in the area of these finds; no surface features or depressions appeared to indicate a lime kiln existed here. From inspection of the area immediately adjacent and over the edge of the steep, 40-foot-high embankment it appeared that debris in this area had at one time been plowed over the edge, as if the whole area had been surface cleared except for the raised tramway. The kiln lining debris found here might have been dumped here after razing the kiln stack at the north end of the tramway.

The Central District

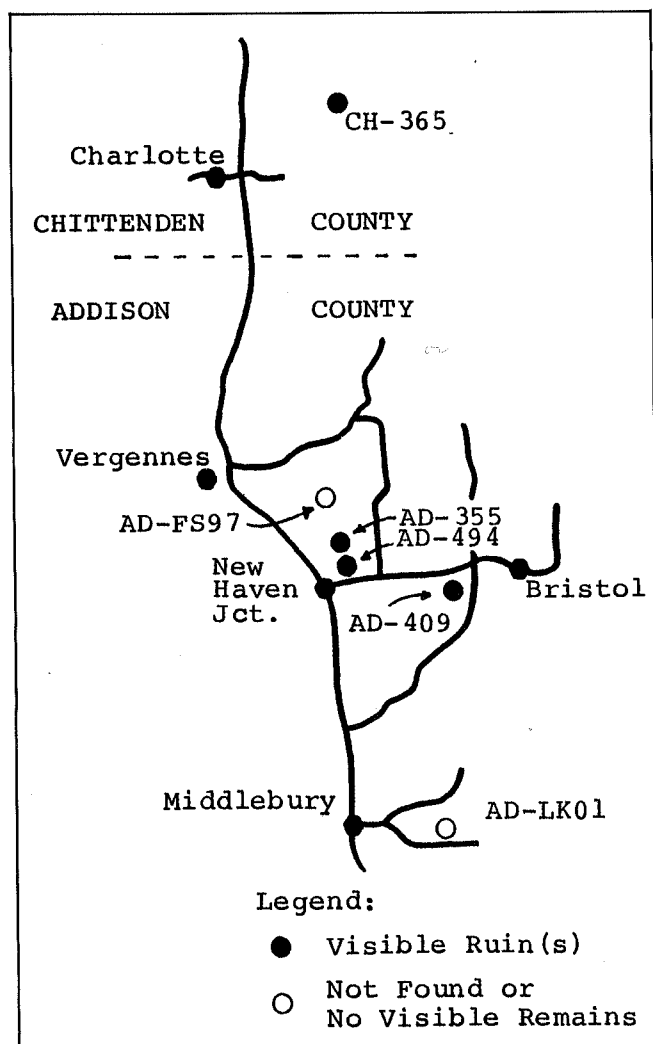
The central district, which consists of Addison, Orange, Rutland, and Windsor counties, contains 66 lime kiln sites, over half of all the known kiln sites in the state. Windsor County contains 34 sites, with 18 sites in the town of Plymouth alone.

ADDISON COUNTY

AD-409 Bristol Lime Kiln (Bristol): A standing lime kiln ruin was found a mile west of Bristol village in 1986. Information leading to the kiln was provided by Bob Carpenter of Bristol.

The Lime Stone is found in many different parts of Bristol on the west side of the mountain and especially along near the West line of the town is to be found a broken disconnected range of ledges of an inferior quality of Lime, where Lime Kiln[s] have been built and lime burned, which was a substitute for a better article in an early day. But the best quality of lime is now to be had from Middlebury and New Haven, two adjoining towns, and of a quality so far superior to ours in Bristol that no kilns have for many years been burned. The time may come when these Lime Ledges may be considered valuable to be burned for agricultural purposes. There has no good marble as yet been discovered in Bristol (Munsill 1979:10).

The stack is an early commercial type measuring 20 by 20 feet square at its base and 20 feet high. Flat iron rods slotted near their ends are laid in the stonework at corners. There are



8-17. Southern Chittenden and northern Addison counties lime kiln sites.



8-18. A magnificent lime kiln ruin at the end of a private driveway just west of Bristol village.

face plates snug to the stone walls with beveled iron pins inserted into the slots, keeping the face plates, and thus the stone walls, from shifting outward. This type of iron binding, face plate, and beveled pin is similar to that found on blast furnaces at Troy, Pittsford, and Forest Dale.

Wood beams support the roof of the west archway, possibly the work arch, if the amount of burnt lime, stone lining, and brick found outside this arch for a number of feet is an indicator. The beams extend the width of the kiln and lie horizontally side by side, measuring about 10 by 12 inches thick.

Included in the breakdown of the stack were some firebrick and some red brick. On the face of the firebrick is marked McL&H CO TROY NY, indicating that the kiln operated into the 1880–1890 period.

AD-494 Lyman-Martell Lime Kilns (New Haven): Ruins of two lime kilns were initially visited on the property of Alson Martell on Quarry Road in the northwest part of New Haven in early 1990 in company with Mr. Martell, Bob West, and John Peters. John knew of the kilns and led us to Mr. Martell's house. The ruins were reinspected and recorded later in 1990.

Lime works along Quarry Road were developed as early as 1810, and land records refer to a quarry in operation in 1811. Thomas Perkins of Boston, one of a three-man partnership, may have provided the initial capital. John Lyman was owner in 1816, and Meeting house accounts show that he furnished most of the lime used for plaster and masonry. Quarry and kiln were used intermittently through the 1800s (and there may have been some connection with a kiln located not too far distant, in the corner of Ferrisburg south of Plank Road). Joseph W. Palmer listed a lime kiln in the county directory of 1881 (Farnsworth 1984:147).

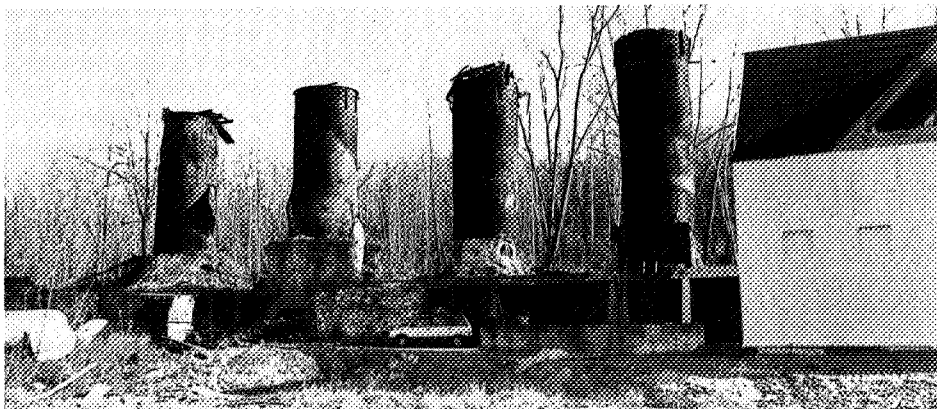
Thomas Perkins of Boston, mentioned by Farnsworth, was one of a consortium of entrepreneurs who formed the Monkton Iron Company at Vergennes in 1809–1816 (see chapter 4, AD-146).

Limestone burned in these kilns came from the south-most of the two quarries identified in this vicinity on the USGS Monkton topographical map. The 1871 Beers map of New Haven indicates "Lime Ledges" directly in the vicinity of the quarries and lime kilns. The lime industry was reactivated early in the 20th century with an expansion to the west and construction of what became the Green Mountain Lime Company (AD-355). Limestone for burning in these later kilns came from the north-most of the quarries indicated on the USGS topographical map. The ruins are about 100 feet north of the Martell house, and between the house and Quarry Road. The area of the ruins is overgrown with dense undergrowth, making measuring and photography difficult. The undergrowth also makes it hard to see the perspective of the entire site. Between the kiln ruins and the Martell house are several hundred feet of exposed escarpment, up to 20 feet high in some places, which was probably an early quarry that provided limestone that was burned in the earlier of the two kilns at this site. The two kilns are built into an approximately 20-foot-high escarpment, which generally runs southwest-northeast.

The northerly ruin appears to be the older of the two lime kiln ruins, being more primitive in construction. It is made from coarse, smaller stones than those of the other ruin, and is a circular collapsed ruin with the usual round depression in the middle. Measurement of the ruin is difficult due to the degree of collapse and difficulty of determining wall locations, but it is estimated that the ruin is about 5 feet high from local ground level (local ground area is covered with scattered stonework) and about 9 feet inside diameter. Stonework connects the ruin to the escarpment behind it. Height of the escarpment here is about half as high as for the southerly ruin, about 20 feet away. No red brick, firebrick, or bindings were seen in association with this northerly ruin.

The southerly ruin is the more obvious of the two, standing about 12 feet high and 18 to 20 feet across the front. The outer wall is made of fine cut ashlar. Although the ruin is partially collapsed in the center, in many respects it resembles the Bristol lime kiln (AD-409). Breakdown is more severe on the southwest wall, where much red brick and firebrick lie about the sides of the ruin. One-inch-diameter iron binders protrude out the upper sides of the breakdown. The rods are end-threaded and contain 1¾-inch-square by 1-inch-thick nuts. On the northeast wall is a unique binding arrangement. Across the front of the kiln are two wood beams; the outer beam about 12 by 12 inches square, and the inner beam about 6 by 6 inches square. The beams supported the kiln wall above the archway, which is now collapsed behind the beams and slumped outward below them. Red bricks measured 8 by 3¾ by 2¾ with no markings. The wedge-shaped firebricks measured 9 inches long by 2½ inches thick, 4½ inches wide at the wide end and 3¾ inches wide at the narrow end. All firebricks appear to be marked McL&H CO TROY NY.

About 10 feet north of the older ruin is an approximately 20- by 15-foot foundation wall, which served an unknown purpose. No obvious domestic or industrial materials were



8-19. Spectacular ruins of four lime kilns just east of New Haven Junction. The base of the fifth kiln is at the left.

found on the surface inside the foundation walls.

These lime kilns are two of many similar lime kilns that operated in Vermont in the 19th century and were predecessor operations to the Green Mountain Lime Company (AD-355), just west over the hill about a half-mile away.

AD-355 Green Mountain Lime Company (New Haven): Ruins of the Green Mountain Lime Company were found in 1985, about a mile east of New Haven Junction. The kilns are about a quarter-mile south of Lime Kiln Road, on the property of Dennis Sparling.

Early in the present century the industry was revitalized. The Brewer family purchased another 64 acres lying west of the Palmer lot and went into business as the Green Mountain Lime Company in 1907. At this time a spur track was built to connect the quarry with the Rutland Railroad. After World War II, the property passed to John Dalglish and in 1950 to Vermont Associated Lime Industries, a company with plants at several other locations in western Vermont. For a decade or so the business flourished. Eight men under foreman Howard Beckwith could produce 6 to 10 tons of agricultural lime in an hour and 15 tons of hydrate in an 8-hour day. Powered machinery included quarry equipment and rock crushers. In the production of hydrate, finer pieces of rock were subjected to a hammer mill crusher and then conveyed to an upstairs air separator, which pulled fine materials to the top and deposited waste at the bottom. Water was then mixed in (at an approximate rate of 50 gallons to 1900 pounds), the product machine-bagged, and shipped by rail. Kilns for burning the stone were abandoned when wood for firing them became hard to get, but materials were trucked to a coal fired kiln at Winooski. Business faltered in the mid-1960s and closed soon after (Farnsworth 1984:147).

In 1910, Perkins reported three kilns in operation, capable of producing 350 barrels of lime per day (Perkins 1910:349). Operations in 1916 were owned by The Brewer Company of Worcester, Massachusetts, with W. J. Dandrow, Superintendent. The limestone quarried was difficult to burn but yielded the best-quality lime. By now, five wood- and coal-burning kilns were in operation, using the Eldred Process by which the

kilns were closed at the top and "down-comers" brought the carbonic acid to the hearths. This partially checked the combustion to give a more uniform heat. The quarry was connected with the kilns by a horse tramway. The kilns had a production capacity of 12 tons each per day, but labor shortages prevented maintaining that capacity (Jacobs 1918:162-163). Among brands produced by the company were Chemical Hydrate, Mason's Hydrate, Snow Fluff Spraying Hydrate, Agricultural Hydrate, and Sure Crop (Jacobs 1937:19). It was not long before limestone was shipped in from Winooski because the local quarry could not keep up with the demand of the five kilns.

Stone Lime.

THE subscriber has on hand and will keep constantly for sale, at the marble quarry, about a mile and a half east of this village, near Millan Stowell's, on the road to Dea. Boyce's, a first rate article of Stone Lime, which will be sold on reasonable terms. NATHAN MYRICK.
Middlebury, June 30, 1841. 8tf.

8-20. Middlebury People's Press, *Middlebury*, Dec. 14, 1841.

The steel shells of four of the kilns still stand in an east-west line; the fifth ruin, at the eastern end, is totally collapsed. Much brickwork and hardware remain to aid in interpretation of the ruins. Concrete foundation slabs mark the locations of buildings that once were associated with the operations.

Uphill and immediately south of these ruins (between the five iron shell ruins and the water-filled quarry) are possible collapsed remains of two earlier kilns. These could have operated transitionally between the demise of the Lyman-Martell kilns (AD-494) and the more modern five lime kilns at this site.

The 1963 USGS Monkton map shows a spur track leading east from the main line to the kiln site; only an isolated trestle now stands in the middle of the field to mark where the track ran. The four tall, surviving, rusting iron shells are visible southward across the valley from Lime Kiln Road.

AD-LK05 Gibbs Lime Kiln (New Haven): East of Beldens

STONE LIME

Kept constantly on hand and for sale by the subscriber. Kiln two miles east of Middlebury village near David Boyce's. The Public may be assured in the purchase of Lime this Kiln that they will get a first rate article, equal in all respects to any in the County and in whiteness far surpassing any other.

NELSON CHITTENDEN.

Middlebury Oct. 23. 1846.

8-21. Northern Galaxy, Middlebury, June 15, 1847.

Marble Works.

THE subscribers respectfully inform the public that the Marble works lately occupied by Case & Spalding, are now in operation, and they are prepared to furnish all kinds of

Sawed Marble, caps and sills,
Tomb-stones, Monuments,
&c. &c.

at short notice.

STONE LIME,

Kept constantly on hand.

GIBBS & CHITTENDEN.

Middlebury, July 19, 1843.

11; y 1

8-22. Northern Galaxy, Middlebury, Feb. 7, 1844.

was a marble quarry known in the late 19th century as the Cutler marble quarry, where Isaac Gibbs burned lime at an earlier time. The quarry was also known as the North Middlebury quarry and also the Old Middlebury quarry (*Marble Border* 1885:24, 48). The quarry was reported as "celebrated for furnishing excellent lime" (Adams 1846:234-235). Theodatus Phelps originally opened the quarry in 1830 and built a mill for sawing and processing the marble. Gibbs owned the quarry from 1851 to 1861, followed by others until the marble was exhausted and the quarry abandoned about 1885 (Farnsworth 1984:148, 231).

The 1871 Beers map of New Haven shows "Old Middlebury Quarry Co." about two miles east of Beldens on the north (New Haven) side of the Middlebury-New Haven town line. The quarry is not identified on the current USGS map, which does show Muddy Branch flowing northward through the quarry area.

Inspection of the area in 1991 resulted in finding the main quarry, stone tailings, and foundation remains of the marble mill, but no evidence of a lime kiln.

AD-FS97 *Plank Road Lime Kiln (Ferrisburgh)*: An unsuccessful search for a lime kiln in the vicinity of a quarry along the Old Plank Road was made in 1987. A kiln is indicated in the

1871 Beers map of New Haven, but just outside in Ferrisburgh. Only the quarry is indicated in the Beers map of Ferrisburgh.

The site is a low limestone escarpment that might have been worked at an early time. There was no sign of a kiln ruin or remains. The immediate area of the site is about 100 yards south of the Old Plank Road; the intervening area is a cornfield. Reclamation of the land for farming and plowing probably destroyed any surface remains. There might have been some connection with this kiln and those of the Green Mountain Lime Company (AD-355) about a mile south.

AD-LK03 *Chaffee Lime Kiln (Granville)*: Limestone on William C. Chaffee's farm in the north part of the town was analyzed in 1857 as being good for the manufacture of lime (Hitchcock et al. 1861:695). Although this is a vague reference to a lime kiln somewhere, there might still be a kiln ruin nearby waiting to be found. No attempt had been made to inspect this site.

AD-LK02 *Marsh Lime Kiln (Hancock)*: Lime was burned south of the village due west of the bridge over the White River and about 750 feet above the valley floor, on the property of D. G. Marsh (Dale 1915:19-20). The Beers map indicates a limestone ledge at approximately this location.

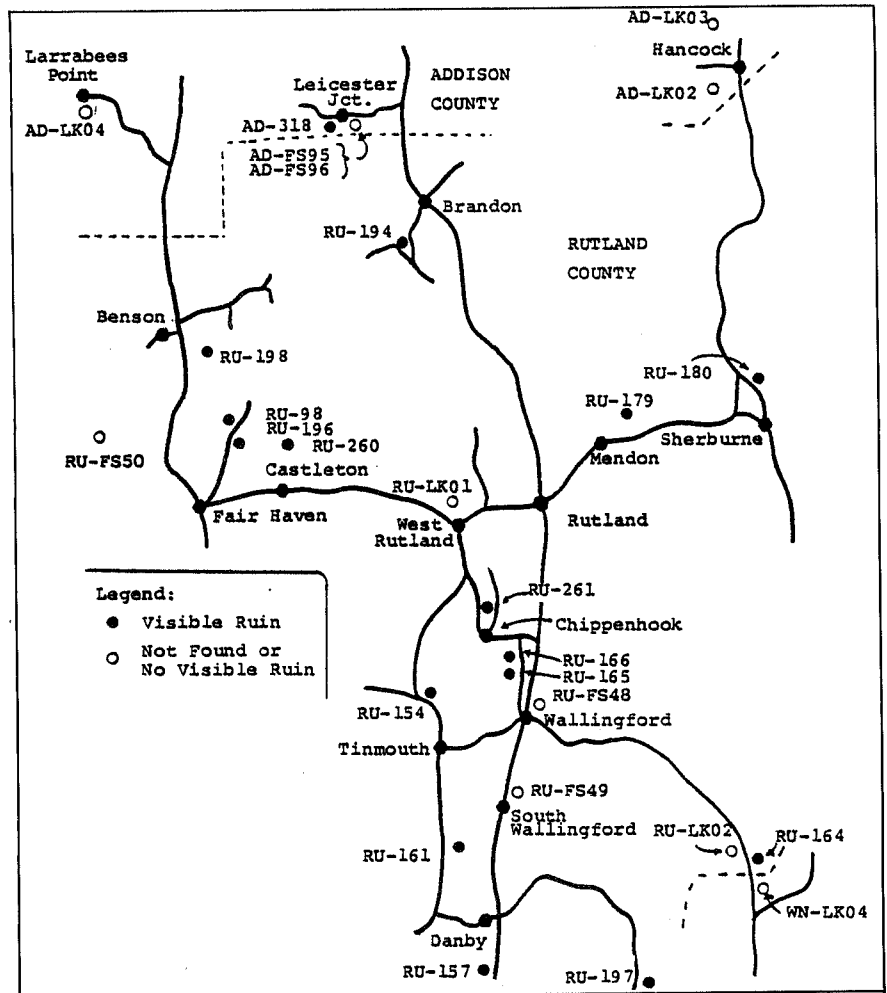
This kiln site is suspiciously close to a reported and yet unlocated charcoal kiln site (see chapter 6, AD-CK01). There might be both charcoal and lime kiln ruins here, or maybe just the lime kiln ruin. When the area was unsuccessfully searched for remains of the charcoal kiln in 1989, it was not known that a lime kiln site was also here.

AD-LK01 *Quarry Road Lime Kiln (Middlebury)*: A lime kiln is shown on the 1857 map of Addison County, about two miles east of Middlebury Village on the south side of Quarry Road. The site appears to be about 500 feet west of Muddy Brook. The kiln is not shown in the 1871 Beers map of Middlebury although the map does show the Vermont Marble Quarry just northwest, on the north side of Quarry Road, which might have had some connection with the kiln.

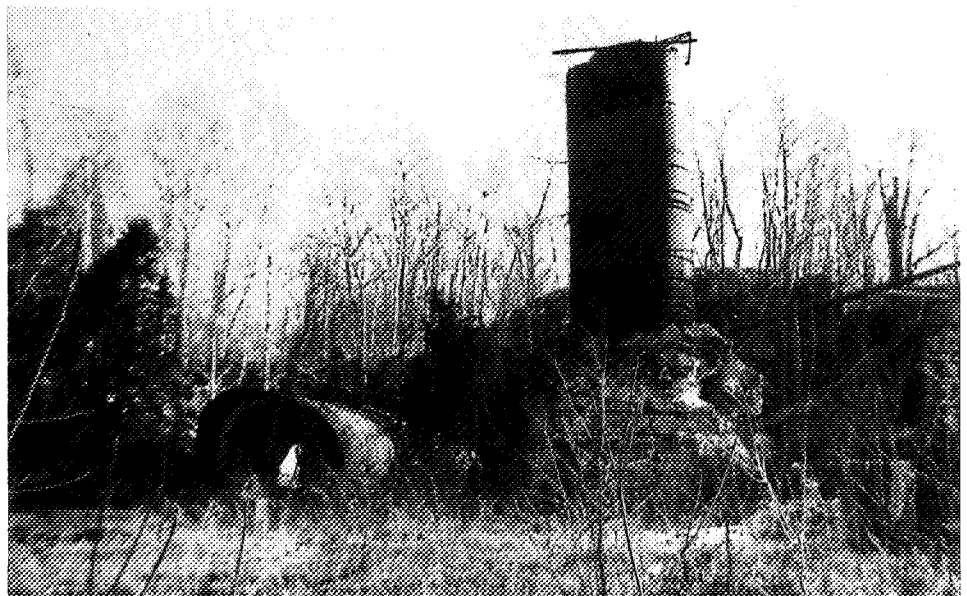
A drive-by inspection of the site was made in 1991 and nothing resembling a kiln ruin could be seen from the road. The field is fenced and permission will be obtained at a later date for closer ground inspection.

AD-318 *Huntley Lime Kilns (Leicester)*: The lime kiln reported built by J. E. Higgins, John B. Matot, and L. P. White in 1852 might have been the first lime kiln in town. Higgins eventually ran the operation alone, and after his death the business was run by Conant & Bascom. John A. Conant managed the business and eventually took Charles Dennison as a partner, who in 1883 controlled the interest alone (Smith 1886:480).

The 1857 map of Addison County shows the marble quarry and lime kiln on the south side of the road, just west of the railroad station. By 1861, two kilns were operating, run by the Brandon Lime and Marble Company and making 25,000 barrels of lime annually. The lime was sold to the Boston Gas Light Company (2½ tons daily usage), the Waltham Bleachery Company, the Somerville Bleachery Company, and soap manufacturers at the Rumford Chemical Works at Providence (Hitchcock et al. 1861:750-751). Owners in 1886 were J. W. Buell of Orwell and O. C. Huntley, who operated the kilns under the name Huntley & Buell, making an average of 75 barrels of lime a day (Smith 1886:480).



8-23. Southern Addison County and Rutland County lime kiln sites.



8-24. Lime kiln ruin at Leicester Junction, which operated in the 1850s to the 1930s.

In 1918 the operations were owned by Harry B. Huntley and the quarry had grown to 450 feet long, 125 feet wide, and 75 feet deep. The two kilns were fueled by wood and had a daily capacity of 10 tons each. Burned lime was used mainly for chemical purposes but the finer quality went for fertilizer. Price was \$11.00 per ton and \$2.00 per barrel (Jacobs 1918:163).

The kilns operated into the 1930s, burning dolomite from a quarry that was located immediately south of the kiln. Lime from the kiln was used at tanneries for preparing hides, at paper mills, for fertilizer, and for mortar. Annual capacity of the works was 7,000 tons (Oliver Huntley to author, March 11, 1984). It was shipped west on the Addison Railroad to Larrabees Point, thence over a wood trestle across Lake Champlain to Ticonderoga, New York. The railroad was abandoned in 1951 (Shaughnessy 1981:164).

The ruins are on the south side of the highway, west of the Otter Creek, and were inspected in 1984. They are characterized by stone walls, foundations, and the remains of two brick-lined iron shells. One shell is standing; the other has tipped over and rests on its side. The bases of both kilns are intact. The late Oliver C. Huntley, descendent of O. C. Huntley mentioned earlier, lived just northeast of the kiln site and was interviewed about the ruin. He worked at the "newer" lime kilns (AD-FS96) located just southeast, which he managed for a number of years. Students from Middlebury College frequent the ruins as part of their geology studies, courtesy of the owner who preserves the ruins.

AD-FS95 Powers Lime Works (Leicester): About 100 yards south of the highway at Leicester Junction, on the east side of Otter Creek, George Bascom and W. Powers built a lime kiln around 1876, which was immediately purchased and operated by George O. Swinington. It produced about 20 barrels of lime daily (Smith 1886:480). The 1871 Beers map of Leicester shows the Powers Lime Works just south of the road and the quarry about a half-mile south. In 1910, the Leicester Marble-Lime Company, managed by Swinington, produced about 25,000 barrels of lime per year (Perkins 1910:351). The site was not inspected because the access road was chained and posted (1985).

AD-FS96 Swinington Lime Kilns (Leicester): The three lime kilns of this company were erected in 1925, a half-mile south of AD-FS95.

We found a small compact plant where they quarried, burned, and packed in bags a variety of products made from select limestone.

The quarry has been in operation intermittently, ever since 1800 when they used ox carts to haul stone to the retort where it was baked. This original retort, or kiln, is still on the property [AD-318] and although not in use still looks good. It is of stone construction and was used from 1800 to 1863 when it was replaced by a steel kiln.

In 1925 new owners erected three new lime kilns and these are operating 24 hours per day, 7 days per week, and 52 weeks per year.

The stone is quarried in small pieces, loaded in dump carts by two Oliver tractor loaders, one a model 70 wheel tractor with Ware loader and the other a model A crawler with Ware loader, and hauled out of the pit over rails on a steep incline.

The best of the stone is used to make chemical lime for the paper industry; the next grade is used for agricultural quicklime; and what we assume are "leavings" are used as crushed rock for road building and concrete.

The best stone is dumped into the top of the kilns and baked at 2300 degrees for four or five days; that is, they dump continuously into the top and draw off the finished product continuously, taking the required time to pass through the furnaces.

Two firemen are on shift at all times to keep the fires going, using about 100 cords of wood and 25 tons of coal per week.

The plant loads about 200 tons of bagged material into [railroad] cars each week for shipment to many parts of the country. The plant is owned by Dallock Sales Co. of New York City and they do all the merchandising from the main office (*New England Construction* Oct. 1947:39).

The kilns operated to the 1950s and only the kiln bases remain (Oliver Huntley to author, March 11, 1984). The site was not inspected because the access road was chained and posted (1985).

AD-LK04 Peake Lime Kiln (Shoreham): The history of Shoreham discloses that "at an early day there were several kilns for burning lime, but none is now made" (Goodhue 1861:94). One of these early kilns might have been that south of Larrabees Point, on Lake Champlain 12 miles west of Leicester Junction. In a discussion of the value of firestone, its use in the arch of a lime kiln at Larrabees Point is also mentioned (Adams 1845:37), providing a possible early date for the kiln. Although the 1857 Addison County map shows "Marble Quarry & Lime Kiln, R. W. Peake" at the south end of the point, it was referred to as "an old limekiln" only a few years later (Hitchcock et al. 1861:286). Some limestone quarried here was also used as a flux for smelting by the ironworks at Port Henry, New York (Perkins 1933:146), but no mention is made of lime production here in various early-19th-century agricultural and industrial census reports.

Permission to visit the quarry in 1991 was denied by the property resident so confirmation cannot be made whether any kiln remains exist in the vicinity of the quarry. The few residents queried at Larrabees Point knew of no history of lime burning and did not remember seeing any resemblance of a kiln ruin in the vicinity. Larrabees Point became a major lake port and trading center with the opening of the Champlain Canal, and except for the modern cable-guided ferry that still operates between the point and Ticonderoga, New York, the little historic community has retained most of its 19th-century character.

At the state boating access area on the south side of the cove, south of the point, the Addison Railroad once crossed Lake Champlain to Ticonderoga on wood trestles and a floating barge. North from the access across the shallow cove toward the quarry, the tops of wood pilings protrude from the water, possible remains of a small tram railroad that carried marble from the quarry across the cove to the Addison Railroad.

ORANGE COUNTY

OR-FS12 Limehurst Lake Lime Kiln (Williamstown): During the mid-19th century, the bottom of Lime Pond and an area