

Jens Hilke

# STONEWALLS & CELLARHOLES

*A GUIDE FOR LANDOWNERS ON HISTORIC FEATURES AND  
LANDSCAPES IN VERMONT'S FORESTS*



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**Cover Photos:** *Gideon Ricker Farm, Then and Now, Waterbury, VT*

**Acknowledgements:** The authors thank Melissa Currier, Gary Salmon and Janis Murcic for their assistance with this project.

Editing and layout by Ginger Anderson

### **This is a project of the Vermont Forest Stewardship Program**

Vermont Agency of Natural Resources  
Department of Forests, Parks, and Recreation  
103 South Main Street  
Waterbury, VT 05671-0601

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## Introduction

If you own woodland in Vermont, you may wonder if your land contains cultural resources, and if so, what limitations or opportunities these resources present. Cultural resources include historic structures and all archaeological resources. Many cultural resources are buried in the ground and the study of them is rather new. As a result, there is very little regulation of these resources on private land, and most people know little about them. Knowing more about cultural resources and their significance may broaden the management and enjoyment of your woodlands. This guide is meant to give you general information, whether you are merely curious, are interested in long-term land management, or are planning a major development. This guide describes different examples of cultural resources found in Vermont, provides advice on protecting them during forest management activities and gives references for further study.

Cultural resources are the *places* containing evidence left behind by people who once lived in an area, whether an Indian village from 1,700 years ago, a charcoal kiln from the 18th century, or the remains of a logging camp from the 1890's. We call these things "resources" because they can help us understand the past. Cultural resources contain information about where people lived, what they had, and how they behaved. Much of this information comes from the relationship between and among objects, rather than the objects themselves. For example, once an arrowhead is taken out of the ground much of its potential information has been lost. How things are collected may be more important than the object or collection itself.

There are three types of cultural resources: structures, archaeological sites, and cultural landscapes. "**Structures**" refers to buildings, bridges, industrial furnaces, and other elements of the "built environment." "**Archaeological sites**" refers to any places left behind by people, be it a trash dump, an old farmhouse location, or an Indian campsite high in the mountains. "**Cultural landscapes**" refers to large tracts of land that, as a unit, preserve the character of a time or lifestyle, including buildings, sites, and land use. Agricultural land in the rural areas of Addison County is a good example of a cultural landscape.

A useful way to think of cultural resources, prehistoric and historic, is as sheets or layers of material covering the entire state with varying thicknesses for each sheet. You can also think of each layer as representing a particular culture or period in history. Many people mistakenly think Vermont does not have many layers of cultural history, or that there are few archaeological sites. In reality, some of these resources, especially historical ones, can be seen by looking around while walking through your property.

Do not dig to find these; this may destroy cultural resources. By looking carefully at above-ground clues, you will be pleasantly surprised at how much you can learn about your land's history.



## A Walk Through The Woods

When people buy woodland, they obtain not only the present woodlot, but also what has gone on in that woodlot for decades and centuries. A question many woodland owners have is: *“What am I likely to see when I take a walk through my woodland? What things of the past might I see?”* This is a large subject area. To narrow it down we’ll discuss some situations and sites found on forest properties. They are the most common cultural resources you might encounter.

Stone walls are found on a majority of Vermont properties. Prior treatment of land as either pasture or cultivated field was widespread and occurred on most woodlots at some time in the past two centuries. Logging also has taken place, certainly when the land was first cleared, and later, as agricultural uses ceased and open land reverted to woods. Foundations of houses, barns, outbuildings, or sugarhouses, and water wells are not uncommon. Abandoned town roads are often found. Other roads, such as old logging roads and farm roads, run through many Vermont properties. Roads, stone walls, and foundations are the most common cultural resources found.

Other resources are occasionally found. They include: lime kilns, charcoal kilns, mill dams, factory foundations, cemeteries, remnants of horse-drawn farming equipment, stage coach roads, and hollow logs used for culverts or waterpipes. On the ground’s surface, within historic site areas, you may see artifacts such as pottery shards, pieces of glass, nails, dishes, horseshoes and other ironware.

To provide you with an idea of potential cultural resources in the forest setting, we have assembled the following resource descriptions and pictures. The pictures are based upon the most common occurrences listed above. Although we do not propose to document the obscure cultural resources or to present complete coverage, we hope this will whet your appetite to learn more about the cultural resources on your land.

### **1. Foundations of Structures and Sites of Former Buildings**

These resources can be among the most noticeable, even when building walls are gone. Often, the outline of the foundation, and the type of surrounding trees, plants and land features provide clues to the past building use. Sometimes, rectangular holes in the

ground are the only clues to indicate where buildings once stood.

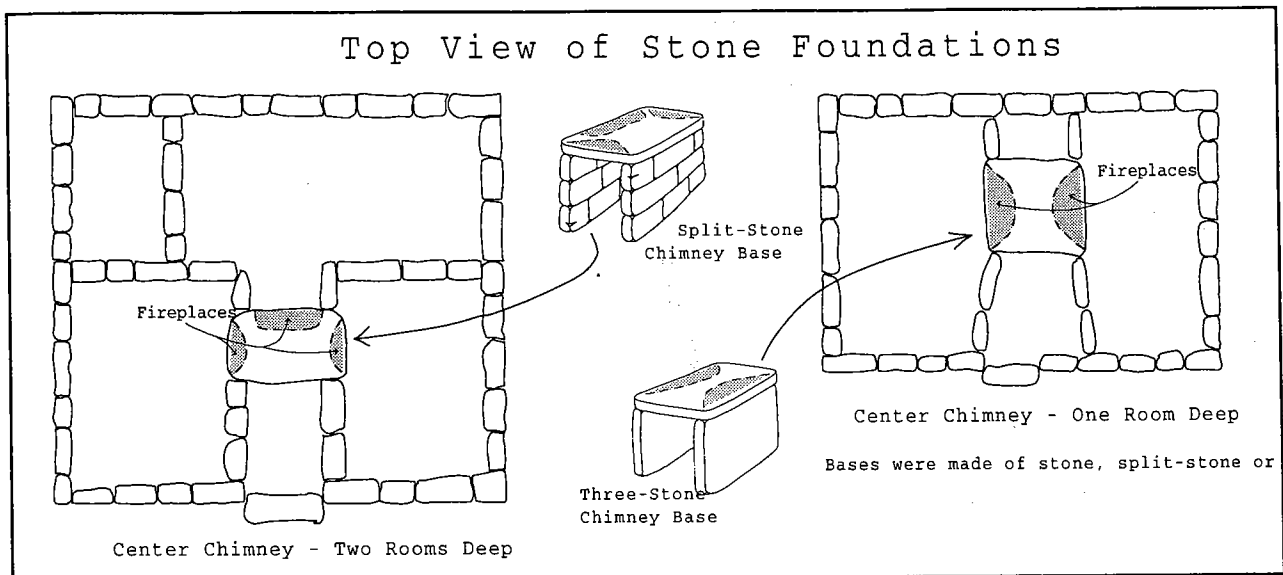
**A. House foundations.**

Early cabins were placed on the ground with puncheon floors without a foundation or cellar. Houses built in the 18th and 19th centuries had cellars. You will frequently find the 'cellar hole,' an excavated pit with foundation walls going 4 to 6 feet into the ground. Even after a century or more, some of these walls still stand straight and erect. Some show the bulges and distortion of decades of frost heaves, the pressure of soils, and the tugging of roots. Houses built in the 18th and 19th centuries were not firmly secured, but merely rested upon their stone foundations. Houses were rarely simply abandoned and left to decay. They were either moved elsewhere or dismantled for re-use of the materials. The remnants you find today in your woodland are the stone work, almost always represented by the foundation.



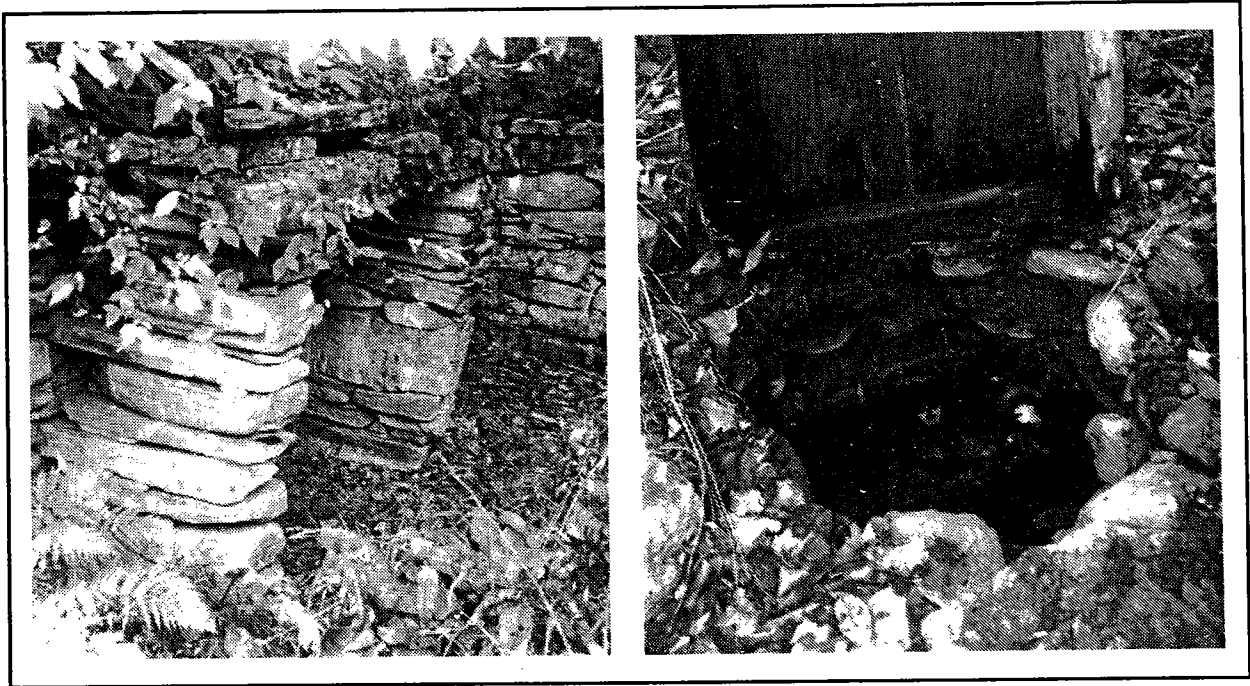
**Cellar hole-foundation-Chester**

The foundation walls give you a good picture of the size and shape of the former house or building. Before 1830, most rural houses were built in a few variations of the "end-chimney or center-chimney house." Two distinct types of center-chimney houses were developed, a "one-room deep" house and a "two-room deep"



house, like the commonly labeled “Cape” house. One-room deep houses are recognized by their narrow width, usually 15 to 20 feet. Two-room deep houses are significantly wider, usually 25 to 35 feet. The houses could be modified into dwellings with one or more stories and rooms on one, two, or three sides of the fireplace (see the book, *Big House, Little House, Back House, Barn* by Thomas Hubka, University Press of New England, 1984 for descriptions, pictures and diagrams of houses of the 19th century). You can measure the dimensions of the outer walls of the foundation to see whether it was a one- or two-room deep house. Often, the structure was larger than the foundation, due to kitchens, ells, porches, and other additions which sat on sills, footings or low stonewalls. Signs of these additions may be gone now.

Frequently, in the cellar portion of the foundation, you'll see massive blocks of stonework. This is the arch that supported the chimney structure. The most common form of chimney support was two walls of granite stones built up and topped horizontally by long stones on which the chimney was built. This structure has the look of a fireplace, but no hole at the top for the smoke; instead it has a solid horizontal topping called the *split stone chimney arch*. An even more massive block of stonework, perhaps with arches on several sides, represents the chimney support in a house with several fireplaces on the central chimney (the rooms were built around it).



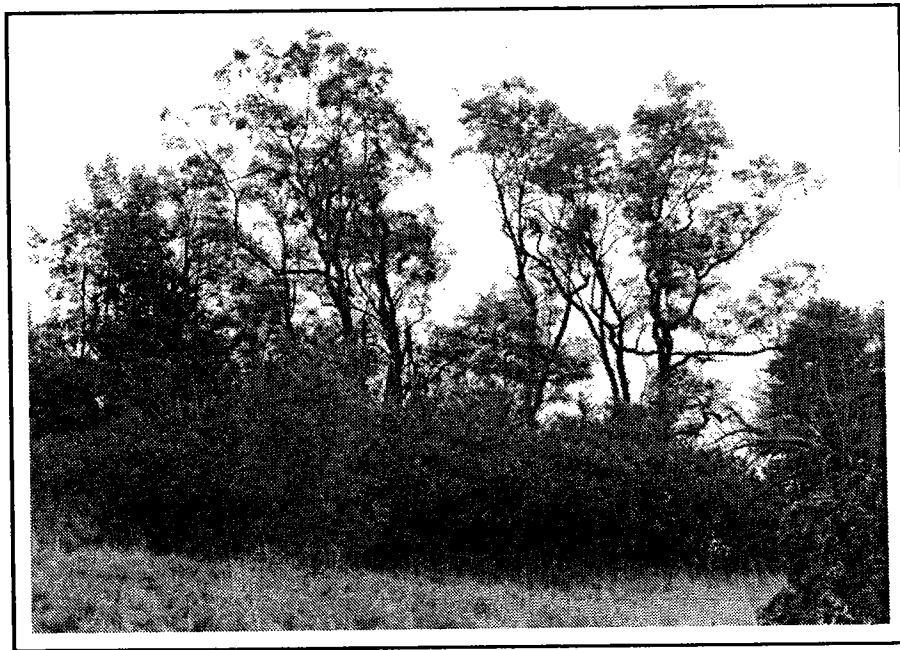
*Left, Example of split arch chimney foundation-Chester, Right, Stone-lined well*

Other stonework found around the house include steps. Stone steps, often large, flat stones, may lead down into the cellar. Often you find stone steps leading to the top of the foundation from the outside of the foundation wall; these were the steps up to the front door or side door. (See photo on page 52.)

Around the house, quite often some distance away from the house, is the well. The well may be as deep as 20 to 30 feet, but most were shallower. The round, stone-lined structure kept the walls of the well from caving in. The hand pump in the kitchen sink did not become common until after the Civil War. Piped-in water became common in the latter quarter of the 19th century when lead pipes became commercially available. Wooden pipelines were tried earlier, but never proved satisfactory. You may still find some remnants of wooden pipeline, made from hollowed-out logs, nested end-to-end. The well was the main water source before these changes; you'll find wells near old foundations in many woodlands.

Most early settlers did not bother with amenities such as planting special trees around the house. As the house became part of a settlement or as farmers became more affluent, plantings and landscaping gained popularity.

The so-called "front yard" didn't become widespread until after 1820. You'll find evidence of the front yard around many foundations. One indicator is remnant shrubs and flowers. The shrubs include lilacs, which might have been planted in clumps on each side of the front door, or in a line to form a hedge. By some foundations, you find the front lawn trees, often two sugar maples at either end of the front yard. Other front yard plantings include roses, day lilies, morning glories, hydrangeas and periwinkle. Occasionally you will also find a stone wall foundation defining the front lawn, where the lawn was on a steep bank and had to be built up to make it level and usable. Later in the 19th century, more exotic trees were planted near the house and in the front yard; these included black locust, white poplar, and Lombardy poplar. Old specimens are still found around some cellar holes.



**Black locust and sumac near an old foundation-Monkton**

**B. Barn foundations.**

Barn foundations are similar to those of houses except the stone foundation was wider, taller and more substantial (builders used boulders, large stones and slabs of granite).

Barns built before 1800 used the "English" style. These had the barn door on the side of the building, opening onto a central threshing room. There was a bay on either side of this central room; these barns had no cellar. Post-1850 barns had the main doors on the gable ends. The central passageway went the length of these barns so wagons could be driven through either door. Frequently these barns were built with a cellar where manure or crops could be stored. Barns were often built on split levels, with a ramp leading from a roadway to the upper level. The ramps were buttressed with stone. You will find these ramps quite often; they give you an indication of where the barn door was located; either on the broad side of the barn or the gable ends. Another feature you may find in a barn with a cellar foundation are steps. These steps lead from the cellar level up to the next floor. The stones used in these steps are much larger and more massive than the steps in a house foundation.

While the foundation is a good indicator of where the barn was, plants are a good indicator of where the barnyard or dump was located. You might find thistles, burdock and nettles growing in the field (or former field). These plant species require rich soils; manure, hay and straw dump sites certainly produce richer soils. Sudden changes in the ground topography, such as a large bump, may also indicate a dump site of manure and straw.

### **C. Outbuildings and other foundations.**

The farm may have had numerous outbuildings including some of the following: pigsties, chicken houses, corn cribs (especially after the Civil War when corn production expanded), root cellar, sugarhouse, icehouse, and pumphouse. During the late 18th century and early 19th century, these buildings were usually separate; later they became add-ons to the barn and house. Stone foundations are visible remains of these buildings; smaller in size than those for houses or barns.

You may find other foundations not directly associated with farmsteads; old factory or mill foundations, for example.

## **2. Walls and Fences.**

The first fences used by early settlers were not stone walls, but fences made of wood. A row of stumps and large log timbers stacked atop each other in zigzag fashion were the first fences. Wood was plentiful and it had to be gotten rid of to make way for fields and pastures. Chestnut and cedar lasted a long time but they were not plentiful in all of New England. Frequently, oak was used and these fences had to be replaced every seven years or so. As St. John de Crevecoeur noted, "Our present modes of making fences are very bad...they decay so fast, they are so subject to being hove up by the frost, it is inconceivable the cost and care which a large farm requires in that single article," (*Sketches of Eighteenth-Century America* cited on page 120 of *Changes in the Land*, William Cronon). When the land began to be plowed for fields, and the plow heaved up rocks, the problem of permanent fences was solved and Vermont and New England's famed stone walls were begun.

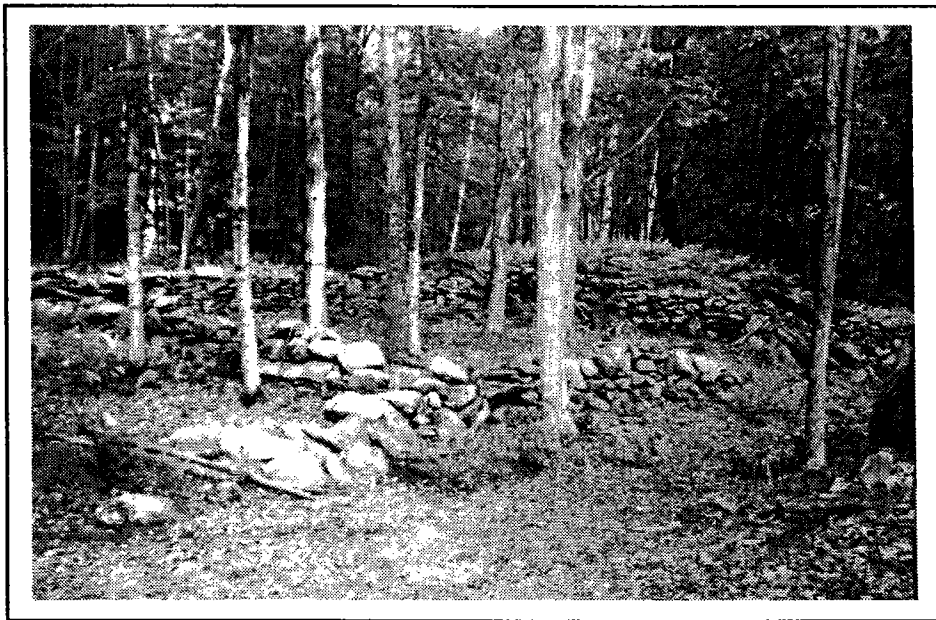
### **A. The single thickness wall.**

This is the most common wall found on woodland properties. Walls vary in height and thickness from a couple of feet wide to several feet wide, and from three to five feet tall. Where the ground became steep, the wall might have been blended into ledge. Where the stone wall was built over a ledge, it was made shorter until the ledge could take over the stone wall duties. The wall picked up again at the base of the ledge. Some walls that were built down steep inclines had long, flat stones placed diagonally in the wall to serve as a brace for the stones behind it. How were the walls kept so straight? Even today you can follow many of the walls with a compass and find that they hardly waver from the line for hundreds and thousands of feet. Some of the walls followed survey lines (range line and section lines), but many seem to be the result of a farmer's ability to line up a wall with just a starting point and an ending

**C. Other uses of stone walls.**

The 'cow path' walls formed a lane or passageway between the barnyard and the pasture. The cows were driven down this path, and the stone walls kept them out of the fields and mowings, until they reached the pasture.

Stone walls forming small, rectangular or square pens, may be town "pounds" for stray animals or more commonly, barnyard walls, night pen walls, or garden walls. The walled-in area around the barn was where the animals could be separated according to species (horses, cattle) or age (calves, yearlings, heifers). The night pen was a walled area where livestock could be brought close to the house at night for protection against predators. The garden was usually located near the house and was walled to keep animals out of the vegetables, herbs, and flowers.



**Animal pen-Chester**

**3. Town Roads and Other Roads**

The first settlers carved a house and farm out of the woods. As more and more people settled there, the area might grow into a town. The main travel way between the farms and the town usually became a town road. A neighborhood supported a road district and a school district. The road district was a cooperative group of farmers who maintained

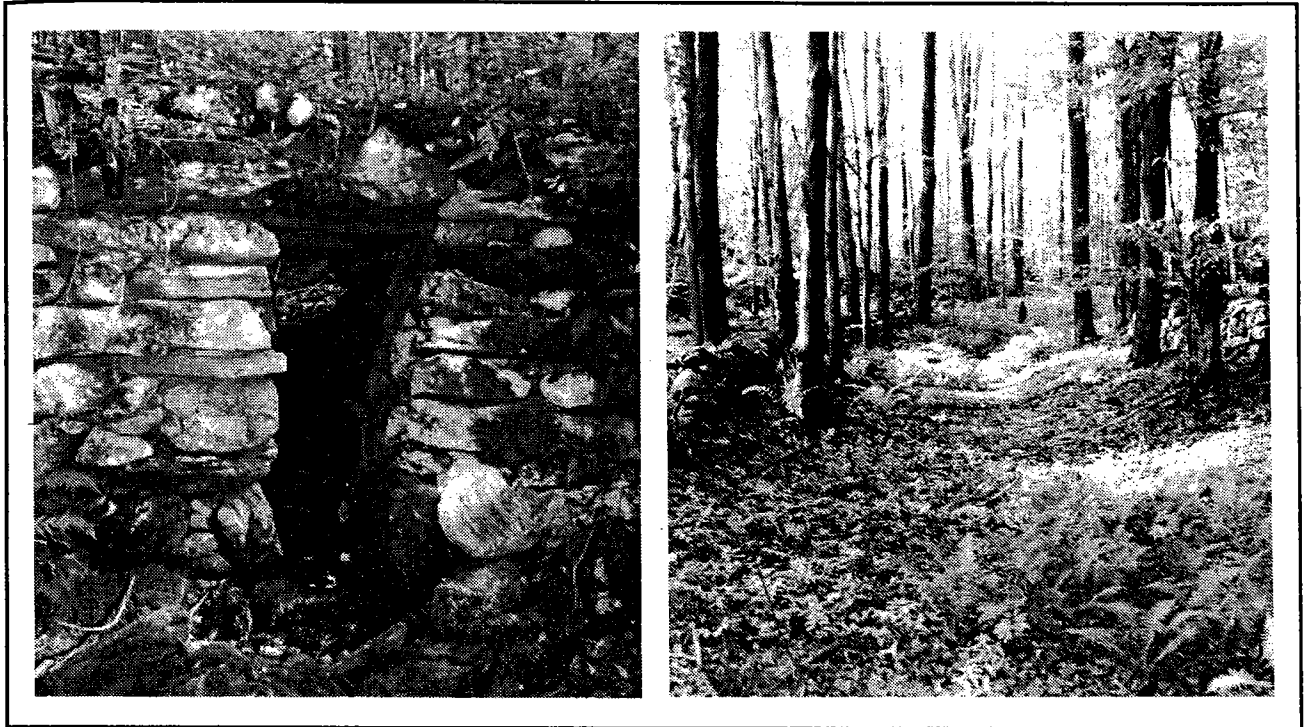
the local road. Farmers were assessed a road tax, which was usually paid by giving days of labor on the local roads. It is not usually possible to distinguish different road types in the field. The following describes the most common ones found in Vermont.

**A. Old town roads.**

Old town roads are found on many woodlands. They are distinguished from a farmstead access road by evidence of maintenance. Town roads frequently have stone wall buttresses. This is a wall of stone laid up on the downhill side of the road to level the road, and stabilize it to keep it from sliding down the hill. Town roads also may have stone culverts. These might be as simple as two stone walls being built up as the abutments, with large stones placed across the top to form the road surface. Other stone culverts were elaborate walls from four to eight feet high. Long stones were placed horizontally across the top of the wall like the stringers on a bridge. Large flat stones were placed across the stringers to form the driving surface of the road. Town roads frequently had ditches to direct water runoff to the culverts.

Since stones were removed to smooth the road surface and place culverts, stone walls may line old town roads for miles, even in areas where the walls did not function as a field enclosure. All of these improvements required continual maintenance. When the location of a town road was changed or a road was abandoned, the road condition declined. Erosion caused road surfaces to gradually sink lower and lower. In many places, the old town road is now four to six feet lower than the bottom of the stone wall which was once the gradeline of the road surface. The road may now resemble a gully or old streambed due to years of erosion.

Since the town road linked up the farms and housesites, wherever you find a foundation you will probably find some evidence of an old road. Many old town roads look abandoned, but are actually still legal town rights-of-way, having never gone through the now formal process of being discontinued ("thrown up") or changed to a "legal trail."



*Left, Stone culvert, Right, Old road, Jamaica*

**B. Stagecoach roads.**

Some woodlands have evidence of through roads called “stagecoach roads” These roads pre-date the town roads and rarely have the improvements of a town road. They may be identified on old maps or surveys as old stagecoach roads. They look like logging roads but there may be abandoned farmsteads, taverns, and cemeteries along such road remains. Another indication of former use might be a house on the property or in the vicinity identified as a former stagecoach inn.

**C. Farm roads.**

Farm roads connected up the various activities of the farm. They may be as simple as set of tracks out to the mowing field, or the road between the walls of the fields that connect the farm and house with the woodlot or the back pasture. These roads probably have grown in over the years and may only be visible now as lines of smaller trees in a road-width band (about 8 to 10 feet wide) winding through the surrounding forestland.

The cultural resources discussed in the preceding sections are the most common ones found in Vermont's woodlands. They are by no means the only ones, as each woodland and each site is unique. Following is a short list of other indicators of cultural resources you may find on your land.

**4. Evidence of past land uses: farming and logging.**

Just over a century ago, around 80% of Vermont was open land; today around 80% of the state is covered by forest. To keep all that land open, cultivation and pasturing were intense and some evidence still exists to indicate these practices. On the farm of a century ago, the following advice was given as to how to lay out the fields:

“The fields closest to the house and barn should be tilled and cultivated. To save labor in hauling manure and prevent loss in getting in the crops...The mowing lots should be next, if the soil permits; as these must be dunged and their crops carted. The lots for pasturage should be next and the wood lots furthest of all the lots from the house.” (Samuel Dean writing in 1791, quoted by Hubka, 1984).

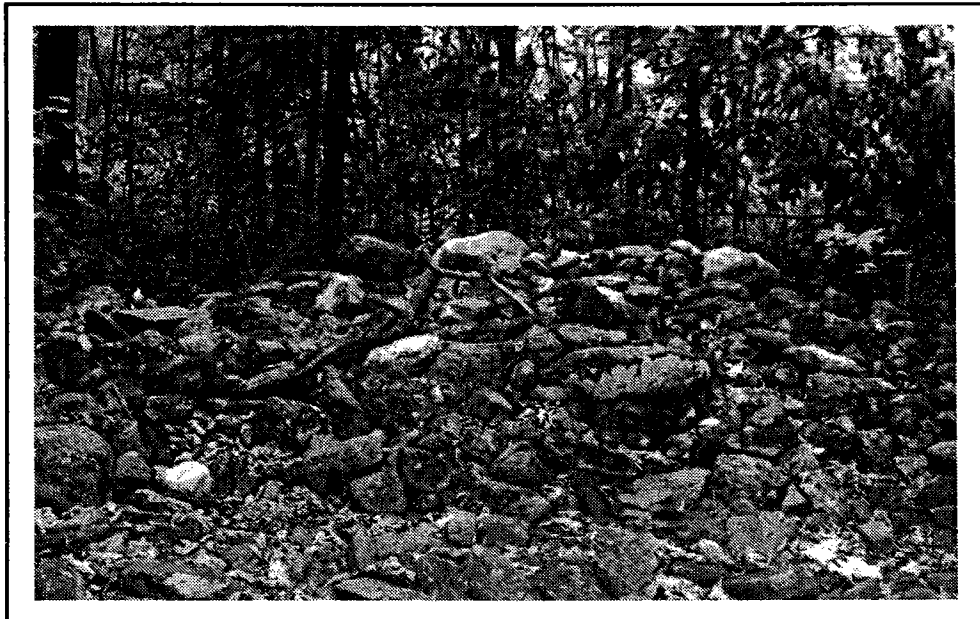
Our present landscape has features that reflect this history.

**A. Fields.**

Stone walls around formerly cultivated fields usually have more cobbles and small stones than do stone walls found around former pastureland. No one cleared their pasture of these small stones, but for easier plowing and better cultivation, cobbles were cleared from cultivated fields and gardens. If the stones were not put in the wall, often they were placed in piles out in the field. This got the stones out of the way for cultivation and saved time and peoples' backs if the rocks were not lugged to the wall. Remember that Vermont's stone walls did not appear overnight, but are the effort of three or four generations of men and women, boys and girls.

Another indication that a field was cultivated is the "dead furrow." As the plow crossed and recrossed a field, each furrow made by the plow would overlap the previous furrow. When the field was harrowed and dragged to make it smooth, all the furrows would disappear except for the last one at the end of the field. Here at the transition between the plowed field and the unplowed field is a "step up" where the last furrow was made. The unplowed ground became higher than the plowed field. This last furrow is still visible in some fields and woodlots decades after the last plowing and exclusive use as a pasture or woodland.

Sometimes a local name indicates how the fields were formerly used: "Potato Hill" in Chester was an area where potatoes were grown. In this formerly cultivated field are found the stone piles with small stones and cobbles.



**Stone pile in a former potato field-Chester**

## **B. Pastures.**

Most of Vermont was pastured. As the advice in 1791 from Mr. Dean indicated, these lots were further away from the house and did not get loads of manure or careful stone removal. Stone walls around the pastured areas were built up with large stones. The objective of stone walls was to keep the animals in place and away from

crops. The stone piles found in the pasture are often anchored by stones too large to be carried to the wall, or left because the wall was too far away, or perhaps because the farmers had more than enough stones to build the wall. Early field clearing may have left the rockiest areas for pasture to avoid continual clearing of endless rocks.

In a pasture where the stone wall came to a ledge, the farmer let the ledge become the fence; the stone wall picked up again where the ledge was no longer suitable for an animal barrier. You can identify an area as former pastureland if most of the rocks were left where they “grew.” The pastures were the poorest, steepest, and rockiest land. Your woodland that is growing on the steep part of the hill or on top of the ridge was probably former pastureland. The stone walls that march up the steep hillsides and go over rock ledge indicate just about all the terrain was pastured.

### **C. Apple orchards.**

Most farms also had an apple orchard. Apples were the main fruit that could be grown in Vermont and were valued because they would keep through most of the winter. Early farmers usually had a small family orchard in close proximity to the house, and some apple trees were usually planted near the “dooryard.” Farther away from the house, usually on the side of a hill and out of the valley bottom where the cold air and frosts settled, was the larger apple orchard. You still find these apple orchards in the woods today. Remnants of apple trees, frequently still found in an even row pattern, are present in many woodlots. The trees are now overtopped by white pines, aspens, or red maples, the trees that come to occupy former open areas, but many of the old apple trees are still alive. Quite often these trees can be brought back into fruit production by pruning them after removing the trees shading them. Some of the old varieties can be perpetuated and will also produce food for wildlife.



*Left, Overtopped apple tree, Right, "Monarch Maples" in an old sugarbush*

#### **D. Woodlots and sugarbushes.**

Beyond the apple orchard and sometimes beyond the pasture or as part of the pasture, is found the farm's woodlot and sugarbush. The woodlot provided firewood and logs. Fireplaces use a great deal of wood. Before the closed cast iron stove of the Pennsylvania Germans was used in New England, as much as 40 cords of wood per year were consumed to cook and heat all the rooms in the house.

An indication that an area has been perpetually used as a woodlot is the absence of walls to keep the farm animals from straying. The presence of old stumps with smooth cut tops indicates that the woodlot was cut off in the recent past. Farmers frequently pastured cows in their woodlot; the animals trampled or ate down the hardwood seedlings. You may find stumps mixed in with larger trees, as well as a lack of hardwood brush in the understory.

The sugarbush or sugar lot is not as hard to detect as the former woodlot.

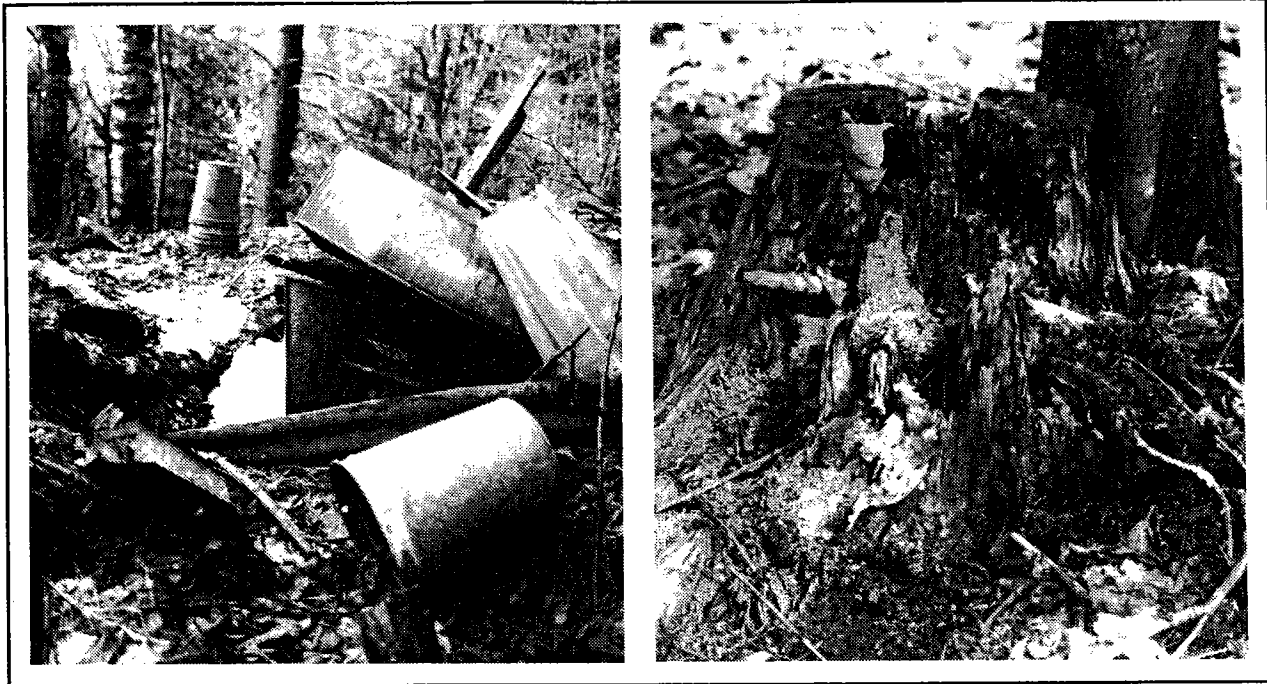
Some areas have remnants of a sugarhouse, such as the foundation of the building or the bricks which held up the arch. Frequently, pieces of old buckets or the iron doors of the arch, where the wood was loaded, can still be found. Sometimes charcoal can be found in the earth to mark the spot of the former arch. Occasionally the pans in which the sap was boiled down are also seen in the woods. A rare find is old metal pipeline, the predecessor of the current plastic pipeline. A sure indication of the old sugar lot is the "monarch" sugar maples still holding out on the site. These large grand trees are frequently found near the top of the ridge or hill, just beyond a grove of young sugar maples (which have probably seeded in from the old trees).

**E. Logging.**

Vermont's woods were cut and burned to make clearings soon after the arrival of the European settlers. Our forest has been cut off at least twice, the first time to make way for agricultural land. This was finished just after the Civil War.

Agriculture declined, so the forest grew back. Much of it was cut again; this was mostly completed by the 1920's and 1930's. This cutting was not as extensive as the initial clearing. Logging has been going on in the "third forest" for some time now.

Stumps are the irrefutable proof that logging has been done on the land in the past. The stumps that are 40 to 50 years old are now rounded-topped mounds, or jagged remnants. In the case of spruce and hemlock which have hard, durable branches, branch stubs are still sticking out of the jagged stump. Some of these stump remnants of 50 years ago may have some smooth tops still left, because they were sawn with a crosscut saw. A tree that falls down naturally will have a jagged, broken-off stump, usually higher than the 12 to 14 inches from the ground which is the standard height of the sawn tree stump. Stumps cut as recently as 25 years ago will be more than half intact. Those from trees cut 5 to 10 years ago will be mostly intact, with fewer signs of decay.



*Left, Remains of a sugarhouse (note buckets), Right, cut stump, 40+ years old*

Other indications that logging has been done on the land are the old "skid roads." Frequently you can tell these old trails by the evenly spaced sets of ruts, which might look like parallel ripples instead of deep grooves. Often the trees along the skid trail have old wounds at their bases, facing the road where logs bumped the tree as they were skidded by it. Early wounds were made during horse logging, then by bulldozer logging equipment, and now with skidders or forwarders. A tree will grow new wood around a wound. The thickness of the callus tissue that grows over the wound is an indication of how long ago the logging injury occurred.

Other indications of past logging activity include structures such as loading ramps and logging camps. Ramps ("headers") were made where the logs were stacked or earth was built up to form a ramp up which logs could be rolled and then dropped down into a truck or wagon. The ramp may also take the form of a bluff at the end of which an opening was carved; a wagon or truck could be driven into that area for loading. Logs were then pushed or skidded out onto the bluff and down onto the truck or wagon.

Logging camps were usually just shacks in the woods built upon the ground

with no foundation; these have not survived the years. You may find some iron cable, or skidding rope as it was called, or some evidence of where the dump and cook shack might have been (such as old stove pipes, tin cans or bottles). But usually, to learn if a logging camp was on your land, you need to research the history of your land. Logging camps were most prevalent in the northern part of the state in the spruce and fir areas owned by timber or paper companies.

Farming and logging were certainly the most common land use practices in the past, and most land in Vermont will show evidence of both activities.

## 5. Some Other Cultural Resources

### A. Cemeteries.

Cemeteries are frequently found in the Vermont woods. They are sometimes maintained by the town, and a road usually provides access, even to the small family cemetery. An example of a woods cemetery is the small stone cemetery in the town of Windham (see photo below). The cemetery has a stone wall around it, bounding an area about 20 by 20 feet. A wooden picket gate provides entry into the cemetery.



*Left, Woodburn gravesite in Windham. Right, Old cemetery -Mendon*

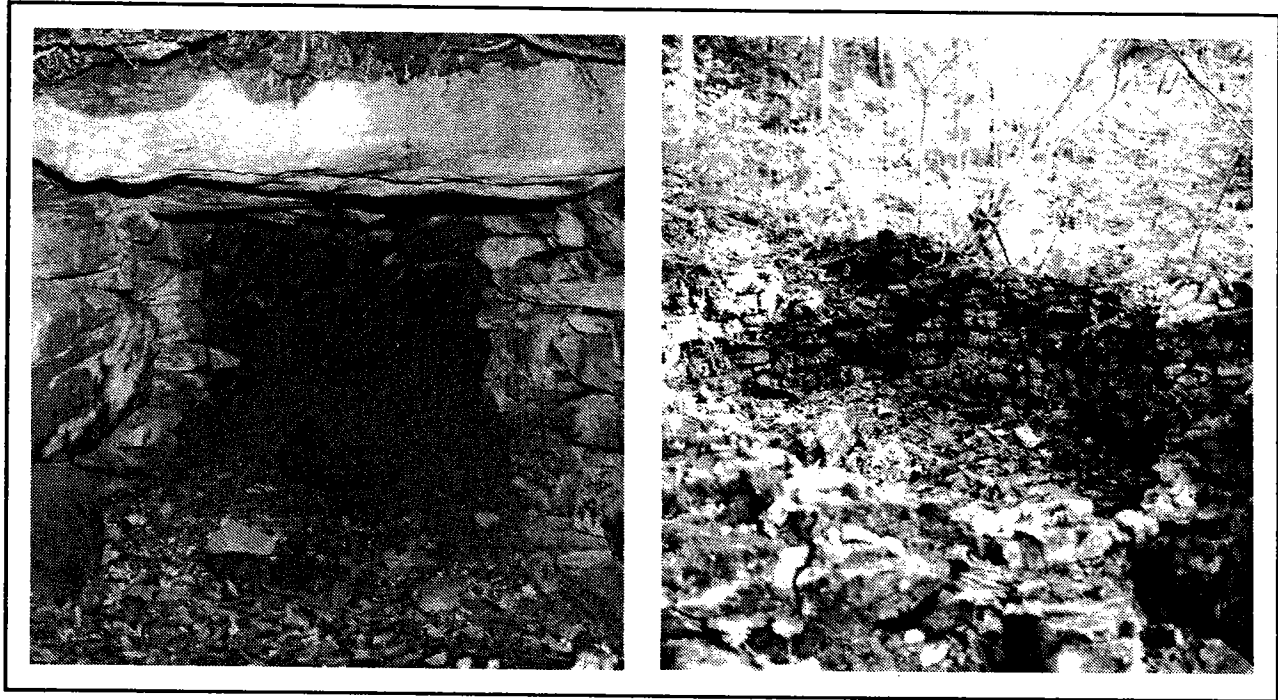
Only two stones are present. One reads: *Dea. John Woodburn, Died, Jan 11, 1851, Age 73 years.* The other stone reads: *Mercy, Wife of Dea. John Woodburn, Died, Jan 14, 1851, Age 69 years.* The local legend is that the deacon and his wife took in an itinerant who happened to have a contagious, infectious disease and that they were also infected and died. They were buried in their own cemetery, away from town because of the fear of contagion. A cemetery is a wonderful source of information about a property. It tells which families lived in the area, and often is your best source for tracing down who lived on your land. It is also a source for tracing living relatives of the former residents.

**B. Lime kilns, charcoal kilns and blast furnaces.**

Lime kilns were common in the early to mid-19th century. A lime kiln is a circular structure made of stones and/or bricks. Limestone was placed in the top of the kiln, a fire was built under it, and the limestone was heated until it turned to powder. The powdered lime fell to the bottom of the kiln and was removed to a wagon or cart. Its primary use was to fertilize the fields or for mortar mix. The odd structure you may find on your woodland might be the remnants of a lime kiln. It usually will be surrounded by white limestone remains (see *200 Years of Soot, Sweat and Toil*, by Vic Rolando, Archaeological Society of Vermont, 1992, for a complete description of the charcoal, limestone and iron industries in Vermont).

The charcoal kiln was usually a circular structure, sometimes with a base of brick or stone, but often just a circular depression cut out of a bank. In early charcoal production, logs were piled up in a conical shape and covered with dirt to keep the pile almost airtight. Vents were placed in the structure to allow enough oxygen to support minimal combustion. The wood was slowly burned until it became charcoal. Later, kilns were made of brick or stone. If your woodland supported a kiln at one time, you might not see indications of the stone or brick structure, but you might find the charcoal; due to its slow decay, the charcoal stays intact for centuries. Blast furnaces were used to produce iron. If you have a blast

furnace on your property, you will find pieces of slag, the molten iron waste. Furnace remains are rare, however, and are almost always associated with a source of water, which was piped or channeled into the site.

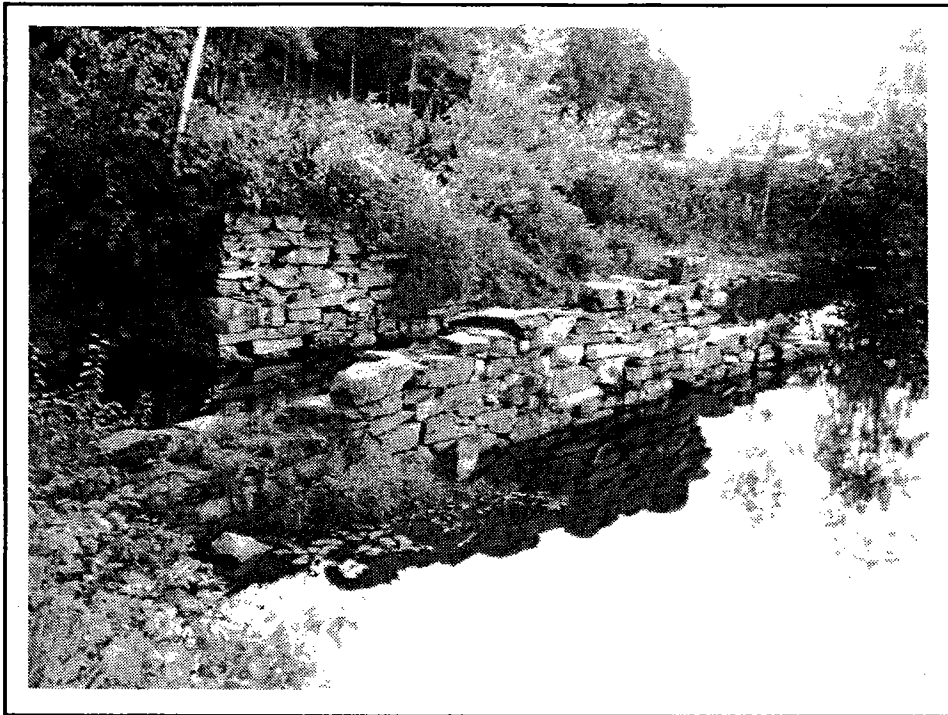


**Left, Lime kiln fire opening (note charcoal)-Weathersfield. Right Top of blast furnace-Dorset**

### **C. Dams.**

Along streams, you may find remains of "diversion dams." These were placed in a stream to divert water into a channel so that it would flow over a waterwheel. The waterwheel supplied power for a sawmill, gristmill, or maybe a cider mill. Some properties have evidence of large dams and millponds which supplied energy for commercial grain mills or large sawmills.

Artifacts associated with mills may still be present such as grindstones, the large circular stones that were turned to pulverize grain to convert it to flour. The most durable parts of a mill are stone dams and causeways; these are the remnants you'll likely find. If the dams were made of wood cribbing and earth, these are probably gone; years of spring floods have washed out or rotted out these structures.



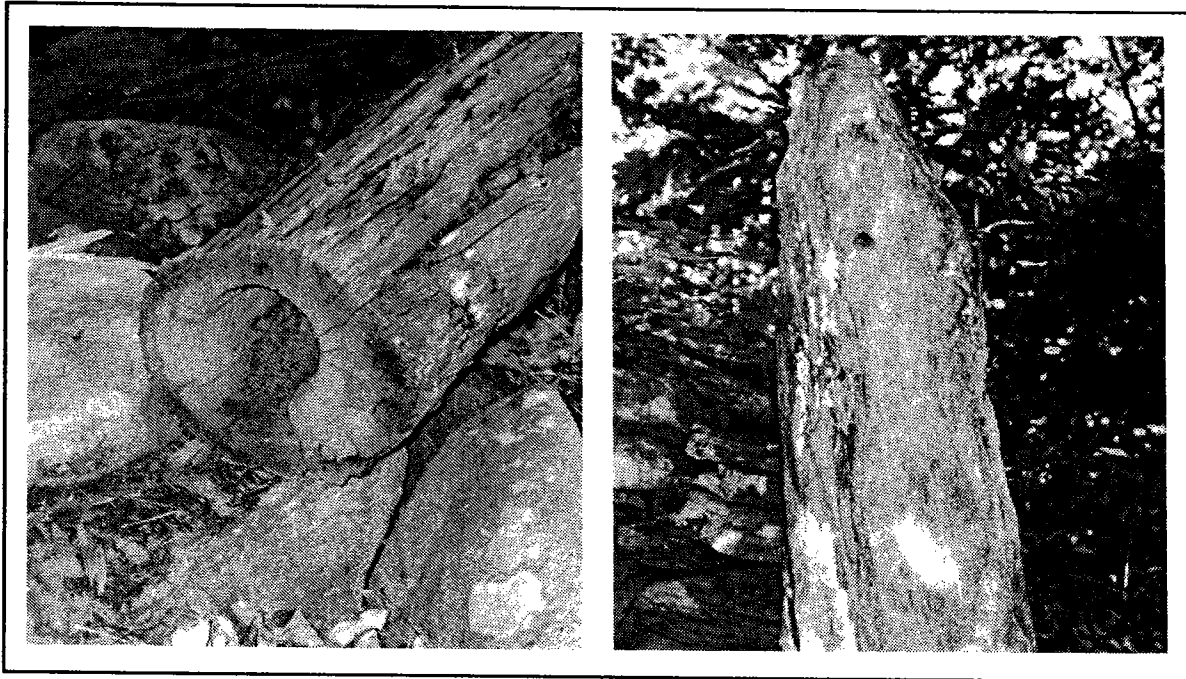
**Remains of a sawmill -Bartonsville**

**D. Water pipes.**

Water pipes were logs or pieces of wood (or occasionally soapstone), which were bored or augered, and used to carry water from the spring or well to the house or barn. Most wooden pipes have rotted, but occasionally a preserved one is found in a swampy area where the conditions are not favorable for oxygen-dependent decay-causing bacteria. Sometimes a water line can be found leading from the well to the house or barn. This is usually marked by a long depression in the ground still visible even after the passage of decades or even a century or more.

**E. Stone posts.**

Stone posts are exactly what the name implies; small upright stone slabs. Sometimes fasteners were placed in the post through which wooden or iron poles would be placed to bar a gateway. Stone posts were often found near the barn. They served as the gate posts for the gate which was used for letting the cattle out into the cow path. Stone posts with iron rings were used for hitching animals.



*Left, Remains of a wooden pipe. Right, Stone post with drilled hole.*

**F. Boundary lines and boundary marking.**

“Colonial claims to ownership of land in New England had two potential sources; purchases from Indians or by grants of the English Crown. The latter tended quickly to absorb the former” (William Cronon, *Changes in the Land*, p. 69). In Vermont, towns were usually established by grants from the Crown through colonial governors. Early real estate speculators later sold parcels to individuals to settle and farm. With the advent of private ownership of land came the need to mark or define the boundaries of ownership.

The boundary lines of a property were first described by topographic features: “The mowing field between the two brooks.” Land ownership was described based on whose lot it adjoined; “Bounded on the north by the Hall Lot.” Two and a half centuries later, surveyors may still be searching for the Hall Lot boundary lines. Surveying with a compass by following bearings and marking measured distances along the line was the method used on the ground to leave legal evidence of these descriptions. The marked boundary lines are what you are likely to find in your

woods. Ax blazing of trees was the most common method used to mark the boundary line. A tree located along the line was hacked at breast height, fore and aft, facing the respective corners of that property line. You may find an oval-shaped scar on a boundary line tree with just a narrow vertical gap still visible because the tree has grown around the blaze. Look closely at that slit and you might see old ax hack marks. The hack marks distinguish the boundary line blaze from an ordinary tree wound. Stone walls or old barbed wire imbedded in trees may also indicate boundaries; landowners wanted to keep their livestock "to home," and the fences or walls served both as boundary marker and livestock control.

Trees marking the corner of a property are blazed on four sides, with from one to three vertical sets of blazes, one above the other. Sometimes corner trees are scribed with the number or names of adjacent lots. "Witness trees" were often marked at boundary corners, so as to have more than one tree indicating a corner's location.

Markers other than trees were also used to indicate corners. Triangular or cylindrical rocks were sometimes set in the ground. A cairn of stones was also used to mark corners (rocks were piled in a pyramid or beehive shape). Incidentally, stone cairns were also used by early explorers and settlers to mark sentry positions. In cedar country, cedar posts were set in a cairn of stones to mark the corner, but usually whatever wood was available was used to create "stake and stones," later "post and stones" corner markers.

One Vermont surveyor told of following a stone wall boundary line until it disappeared into a beaver pond. Another stone wall approached at a right angle; it disappeared into the pond, too. The surveyor got a canoe and paddled out to where he could see the walls meeting underwater. Clearly visible was a cedar post embedded in a cairn of stones: the property corner.

Today, you may find the ax blaze lines replaced with paint. You will often

find the cedar posts replaced with metal rods. The triangular stone corner marker may be half painted. Look closely on old boundary lines, and you might still find evidence of the original line markings.



*Left, Property boundary corner marker*

*Right, Fence wire imbedded in trees can indicate boundary evidence*

#### **G. Special plantings.**

Sometimes two evergreens, such as white cedar in northern Vermont, or spruce in the southern part of the state, were planted at the entryway to a cemetery. Evergreen trees were thought to represent 'eternity' because they were always green, always appeared to be living. Sometimes "marriage trees" are found, a pair of trees that were planted outside the married couple's house. The trees were to grow along with the marriage. These trees were often sugar maples. They were sometimes called "coffin trees," as each one might be cut upon the death of "its" person, and made into a coffin.

You frequently find sumac around old cellarholes and around the dooryard. A sun-light-loving species, sumac was able to thrive after the farmstead fell into disuse. When farmers became more wealthy and began having more formal front yards, the yard off the kitchen became the dooryard, or the workyard. Here equipment was repaired, and sheep might be sheared. The soil in the dooryard took a pounding. A layer of hardpan, or almost impenetrable soil, formed here. Sumac is frequently found growing now in the former dooryard because it can grow on these poor soils.

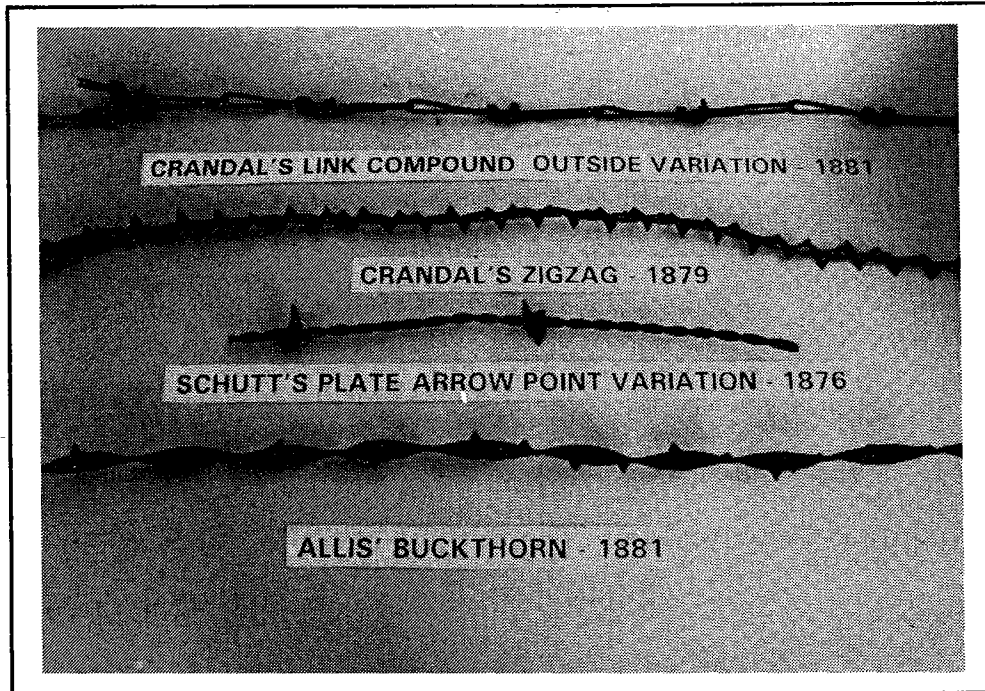
Tansy is a very aromatic herb, and was planted around many dooryards. The garbage was chucked out the back door, and tansy helped mask the smell of decaying vegetables and other foodstuffs. Tansy also is a hornet and yellow jacket repellent. Other herbs and many flowers may still be found around some old foundations. Daylilies and lilacs are two of the most common plant indicators of past homesteads.

#### **H. Quarries.**

Quarries from which slate, granite or soapstone were taken in the past may be found in some woodlands. Drill holes are present in the rock walls. Quarried stone may also be found in some house foundations. These stones can be identified by the drill marks and by the square edges of the corners (see photo on page 39).

#### **I. Wire fences.**

Barbed wire became common in Vermont in the late 19th century. Depending on the type of wire, you can research when it was used. A good source for identifying wire is Robert T. Clifton's book, *Barbs, Prongs, Points, and Stickers, A Complete and Illustrated Catalogue of Antique Barbed Wire* (University of Oklahoma Press, Norman, 1973). Another way to date the use of wire is to look at the growth of the tree that appears to have occurred after attachment of the wire.



Barbed wire from Vermont woodlots (collection of Jim Philbrook, Rutland County Forester).

## J. Prehistoric cultural resources.

These are seldom visible to the untrained observer. They are most likely to be found along lakeshores, river valleys and other water sources, although they can be anywhere. Buffer zones called for in *Acceptable Management Practices for Maintaining Water Quality* and the Wetland Rules help to protect some of these resources. The primary information value of prehistoric sites is contained in the spatial relationship between artifacts, features, and their environmental context, rather than in the artifacts and features themselves. These sites are easily disturbed and impossible to reconstruct. Like historic sites, prehistoric resources are “pollutable” and non-renewable. A thorough discussion of these resources is beyond the scope of this guide. Further information about them can be found in the bibliography and from the Division for Historic Preservation.

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For papers dealing with the economic geology of minerals, see List C.

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Prior to 1993, the headings minerals, mineralogy, crystal structure, crystal chemistry, crystal growth, phase equilibria, clay mineralogy, and access points for mineralogical papers. Other related headings were igneous rocks, metamorphic rocks, sedimentary rocks, metasomatic rocks, sediments, geochemistry, and paragenesis.

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In current practice, the specific mineral is a direct access point.

## HIERARCHICAL LIST

### minerals

alloys (including carbides, nitrides, phosphides, silicides)  
 antimonates  
 antimonides  
 antimonites  
 arsenates  
 arsenides  
 arsenites  
 bismuthides  
 borates  
 bromides  
 carbides  
 carbonates  
 chlorides  
 chromates  
 fluoborates  
 fluorides  
 fluosilicates  
 germanates

halides (includes bromides, chlorides, fluoborates, fluosilicates, iodides, and fluorides)

hydrates

iodates

iodides

molybdates

native elements

niobates

niobotantalates

nitrates

nitrides

organic compounds

oxalates

oxides (including germanates, niobates,

niobotantalates, tantalates)

oxysulfides

phosphates

phosphides

selenates

selenides

selenites

silicates (use a narrower term below if dealing with specific mineral; otherwise larger group)

aluminosilicates

orthosilicates

sorosilicates

orthosilicates, epidote group

orthosilicates, melilite group

nesosilicates

orthosilicates, garnet group

orthosilicates, humite group

orthosilicates, olivine group

ring silicates (cyclosilicates)

chain silicates (inosilicates)

chain silicates, amphibole group

chain silicates, alkalic amphibole

chain silicates, clinoamphibole

chain silicates, orthoamphibole

chain silicates, pyroxene group

chain silicates, alkalic pyroxene

chain silicates, clinopyroxene

chain silicates, orthopyroxene

sheet silicates (phyllosilicates)

sheet silicates, chlorite group

sheet silicates, clay minerals

sheet silicates, mica group

sheet silicates, serpentine group

framework silicates (tectosilicates)

framework silicates, feldspar group

framework silicates, alkali feldspar

framework silicates, plagioclase

framework silicates, barium feldspar

framework silicates, nepheline group

framework silicates, scapolite group

framework silicates, silica minerals

framework silicates, sodalite group

framework silicates, zeolite group

silicides

sulfates

sulfides (including antimonides, arsenides,

bismuthides, oxysulfides, selenides, and tellurides)

sulfosalts (including sulfantimonates, sulfantimonites,

sulfarsenates, sulfarsenites, sulfobismuthites,

sulfogermanates, sulfostannates, and

sulfovanadates)

tantalates

tellurates

tellurides

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niobotantalates

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framework silicates, plagioclase

framework silicates, barium feldspar

framework silicates, nepheline group

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framework silicates, silica minerals

framework silicates, sodalite group

framework silicates, zeolite group

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 chlorides  
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 fluoborates  
 fluorides  
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 germanates

halides (includes bromides, chlorides, fluoborates, fluosilicates, iodides, and fluorides)

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iodates

iodides

molybdates

native elements

niobates

niobotantalates

nitrates

nitrides

organic compounds

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chain silicates, pyroxene group

chain silicates, alkalic pyroxene

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chain silicates, orthopyroxene

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sheet silicates, chlorite group

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sheet silicates, mica group

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framework silicates, alkali feldspar

framework silicates, plagioclase

framework silicates, barium feldspar

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tellurides