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United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is for use in documenting multiple property groups relating to one or several historic contexts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. For additional space use continuation sheets (Form 10-900-a). Type all entries.

A. Name of Multiple Property Listing

Agricultural Resources of Vermont

B. Associated Historic Contexts

Diversified and Specialty Agriculture, 1760-1941
Agricultural Processing, 1760-1941
Sheep Farming, 1810-1910

X See continuation sheet

C. Geographical Data

The state of Vermont.

☐ See continuation sheet

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards for Planning and Evaluation.

Signature of certifying official — Date: 9/23/91

Vermont State Historic Preservation Officer
State or Federal agency and bureau

I, hereby, certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper of the National Register — Date: 11-21-91

Associated Historic Contexts (cont. from cover sheet)

Dairying, 1850-1941

Stock Breeding, 1793-1941

Agricultural Social, Educational and Political Institutions, 1800-1941

Orchard Farming, 1820-1941

Agricultural Resources of Vermont

Statement of Historic Contexts

Contents

HISTORICAL SUMMARY OF VERMONT AGRICULTURE

The history of agriculture in Vermont is one of almost constant change and readjustment. While flux is characteristic of farming due to its dependence upon the ever-changing forces of weather and the economy, Vermont's experience has proven particularly dramatic. The "resourceful" Vermont farmer armed with his legendary "ingenuity" is perhaps more a product of circumstance than of any inherent characteristics.

During the first half of the 19th century, problems such as limited market access, soil depletion, together with periodic bouts of catastrophic weather and insect blight, created major obstacles to achieving any kind of agricultural continuity in Vermont. In addition to difficulties arising from changing national economic policy, problems stemming from competition with other regions, particularly the West, plagued Vermont agriculture throughout much of its long, uneven history. As soon as the westward migration got underway during the 1810s and '20s, the cheaper, more fertile, and seemingly endless frontier drew a significant portion of Vermont's young, able-bodied men and women away from their hill farms to the wide open spaces of the West. Settlement of the West also succeeded in diverting Vermont's markets by producing far greater quantities of products such as wheat, and later wool, at less expense to both the farmer and the consumer. Consequently, those who remained on the farm were, time and again, forced to abandon one agricultural operation in the hope of finding alternative farming activities not subject to out-of-state competition. During the course of the 19th and early 20th centuries Vermont's leading agricultural exports shifted from wheat to wool to dairy products, with subsidiary operations in stock breeding, orchard farming, maple sugaring, lumbering and a variety of other small scale activities.

The earliest years of settlement were in some ways the most stable ones for the Vermont farmer. Although trade took place as soon as settlers had access to a market, the vast majority of the settlers' needs such as food and clothing were provided for on the farm during the late 18th and early 19th centuries. The products sold for export were generally a farmer's surplus and included a variety of goods such as apples, butter, cheese, maple sugar, turkeys, and beef cattle, in addition to wheat and potash which were the leading exports from Vermont farms during this early period.

Large-scale potash exports lasted only as long as the land was being cleared, and large-scale wheat raising was on its way out by the 1820s due to declining yields and growing competition from the newly settled lands of western New York and Ohio which were made accessible by the opening of the Champlain and Erie canals in the 1820s.

Yet as early as the 1810s a new kind of farming was beginning to develop: it was one that would not only thrust Vermont into a position of national and international prominence in the years to come, but it was also the first agricultural operation in Vermont that was distinctly commercial. Vermont's commercial wool growing era began when a flock of prize Merino sheep, imported from Spain, were brought to Vermont by William Jarvis in 1811. By the 1830s, with the combined stimuli of the 1824 tariff on imported woolens, the rise of the wool processing industry, and the opening of the Champlain Canal in 1823, Vermont found itself riding the crest of a large and lucrative agricultural wave. However, this too was short-lived as, by the 1840s, western competitors had once again captured the market, this time with wool. While some Vermont farmers turned their attention to the breeding of sheep for stock, many others diversified their operations, often experimenting with new activities alongside the old. Of all these activities dairying emerged as the most significant.

Although dairying had always had an important place on the Vermont farm it was not until the second half of the 19th century that it was able to develop into a large-scale commercial operation. The growing demand for dairy products in the sprawling urban centers of southern New England, together with the coming of the railroad and the invention of the iced butter car in 1854 which opened those markets to Vermont farmers, provided the necessary basis for the rise of the dairy industry in Vermont. Cheese was the first dairy product to be produced on a large commercial scale and Vermont was one of the leading cheese producing states by the 1860s. While the railroad brought western cheese into the eastern market, it also facilitated the long-range transport of more perishable dairy products such as butter and, later, fluid milk. Butter began to replace cheese as the leading commercial dairy product as early as 1870, and by 1900 Vermont was the leading butter producer in the country. Though competition interfered with Vermont's butter market as well, improved transportation methods during the 1910s allowed Vermont farmers to shift to fluid milk production, an area in

which there was no immediate competitive threat.

While the dairy industry brought with it the gradual rise of specialized, or intensive farming, a trend that was encouraged by the proliferating agricultural organizations of the latter half of the 1800s, many farmers experimented with a variety of agricultural operations such as orchard farming, stock breeding, poultry raising, mink and fox farming, potato, hops and tobacco growing. Though some of these operations, such as stock breeding and orchard farming, took place on specialized farms and attained a status of relative significance in Vermont agriculture as a whole, most of these activities constituted only a part of a series of diversified operations as any one operation was generally unable to succeed on its own. More recently, as the dairy industry in Vermont has come to reside in the hands of fewer and fewer farmers, while many former dairy farmers have left farming altogether, others have chosen to diversify, raising a few specialty crops for a very specific market.

The relatively short-lived, or fluctuating nature of so many of Vermont's agricultural activities has rendered historic agricultural buildings and sites particularly vulnerable as it has necessitated the continual transformation of the landscape. With each transition from one activity to another, buildings associated with the old operations are torn down, moved off their site, or remodeled to suit the new, or sometimes simply abandoned and allowed to decay. The only constant has been the presence of agriculture itself, although in a variety of forms. But that, too, is changing as competition from other states, along with recent development pressures and escalating land values and operating costs are forcing growing numbers of farmers to sell out. Recognizing Vermont's agricultural resources, and having some understanding of their historical and continuing significance in both the development and fundamental character of the state as a whole is an essential step towards preserving, and indeed fostering, Vermont's role as an agricultural state.

1. Diversified and Specialty Agriculture, 1760-1941

While Vermont farmers were engaged in large-scale, specialized commercial operations as early as the 1820s, diversified, or general purpose farming continued in Vermont until well into the 20th century. Unlike southern New England, where proximity to the coast and major urban markets encouraged early specialization, Vermont's inland location and rugged terrain made access to major markets both difficult and expensive. In addition to problems of transportation and market access, competition with the West proved a significant barrier to agricultural specialization and it was a problem that affected not just Vermont but New England as a whole.

The main concern of Vermont's pioneer settlers was basic survival, and the early years of settlement were spent clearing land and ensuring that the family was provided with the basics of shelter, food and clothing. As land clearance took several years, the initial crops of corn and wheat were often planted around the stumps of felled trees. Eventually the stumps were removed to edges of the fields and placed in a tight line to form fencing which served the dual purpose of keeping the livestock from wandering, and marking the farm's boundaries. In addition to the raising of foodstuffs, another primary concern of the early settler was the provision of shelter, for both family and livestock. A family's first house was typically a crude cabin built of logs, and the livestock were housed together in a single shed or barn, also built of logs. It was not until a community grew large enough to support a sawmill that sawn lumber was available for building and the early log structures were replaced with more permanent houses and barns.

While most of the family's needs were provided for on the farm, certain goods such as salt, rum, coffee, tea, molasses and ironware had to be procured through trade. Most of a family's surplus was bartered locally, and any remaining surplus was sent to Boston or Montreal, either hauled overland by sleigh during the winter, or sent by raft or flatboat. Potash, processed tree ashes used for making soap, gunpowder and bleach, was the settlers' first important source of income since a considerable quantity of tree ash was made available through land clearance. The ashes were generally stored in a small, typically masonry structure known as an ash house. By 1800, as land clearance slowed,

fields were improved upon, and grist mills became widespread, wheat began to replace potash as the leading cash crop. Other crops raised in the early years included flax for clothing, hay, oats, barley, rye, and buckwheat. Small kitchen gardens were planted next to the farmhouse to raise foodstuffs such as peas, cabbage, beans, turnips, beets, pumpkins, carrots and potatoes, all of which were typically stored in the house cellar, or separate root cellar. Apple trees, ranging from a single planting to whole orchards, were a common feature on the early farms. Other fruits such as berries, pears, grapes and plums were raised on some farms, though with less success as apples not only thrived in Vermont's climate but they were also the easiest fruit to ship long distances. The family woodlot was also an important source of income. The Vermont farmer has been referred to as "summer farmer, winter woodsman" since winters were largely spent in the woods cutting cordwood for sale as fuel, and timber for the local sawmill. Maple sugar, processed outdoors in a large kettle over an open fire, was also an early farm product and constituted one of the state's earliest commercial exports.

Typical livestock on most Vermont farms in the early 1800s included cows, oxen, horses, sheep, swine and poultry. Next to potash and wheat, cattle were raised extensively during the first half of the 19th century and were exported in large droves to the Boston and Montreal markets each year. Turkeys and horses were also driven to the Boston market during this time. Butter and cheese, though processed primarily for family consumption during this time, provided an additional source of income and were either traded locally or shipped by sleigh to out-of-state markets. Ryegate, for example, was selling butter to Boston as early as 1800. Basically, any surplus on the farm was sold or traded when and wherever a market was accessible.

During the 1820s, major changes began to take place in Vermont agriculture. The early decades of the 19th century were unsettling ones for much of New England, and the restlessness and uncertainty of the times found expression in a series of social and religious upheavals, as well as in a mass migration of New Englanders westward. In addition to the abundance of cheap western land, the flat landscapes and virgin soils of the frontier proved far more conducive to farming than the hilly terrain and overworked soils of New England. After the Erie Canal opened in 1825 the West emerged as a formidable competitor in agricultural production, while

Mother Nature provided further discouragement for the New England farmer as floods, droughts and insect blight plagued the northeast during the 1810s and '20s. As a result, by the end of the first quarter of the 19th century the largely unrivaled prosperity formerly enjoyed by New England farmers had begun to fade.

Declining wheat yields and western competition brought an end to large-scale wheat raising in Vermont, and farmers began to look for alternative operations. While wheat, corn, and oats continued to be raised on a small scale, it was evident that a fundamental shift in land use from crop raising to pasturage for animal husbandry was a necessary step if farming in Vermont was to continue to be economically viable. The 1824 tariff on imported woolens helped stimulate the development of the American woolen industry, and wool quickly replaced wheat as Vermont's leading agricultural commodity. By the late 1820s and early '30s sheep farming had developed into a very lucrative agricultural operation, and many Vermont farmers formerly engaged in diversified farming began to focus their efforts primarily on raising sheep; consequently, sheep farming became the state's first large-scale, specialized agricultural industry. (see Sheep Farming) As the industry grew, large sheep farms began to develop in the lowlands, particularly in the Champlain and Connecticut River valleys, where most of the woolen mills were located.

While specialized agriculture had become fairly widespread with the advent of sheep farming in the 1820s, diversified farming was still practiced extensively in Vermont. Although butter and cheese were becoming increasingly significant sources of income during the 1830s dairying was not yet considered economically viable on its own and would continue to be overshadowed by wool production until the 1850s. Many Vermont farms continued to market a variety of other products such as beef, pork, turkeys, horses, maple sugar, lumber, apples, and various other crops. In the 1830s potatoes began to be raised extensively throughout the state. A family's surplus potatoes were generally sold either to local starch factories, where potato starch was extracted for the "sizing" of clothing, or to distilleries for potato whiskey until they were effectively outlawed by prohibitionists in the 1840s. Silk raising developed to the point of a craze in the 1830s, mostly in the southern Connecticut River Valley region, though it never attained any kind of commercial success.

After 1840 the wool producing industry in the northeast began

to decline. Competition from western wool producers and the abolition of the tariff on woolens in 1846 were among the leading factors responsible for this decline. The coming of the railroad in the 1850s, however, brought about a significant, although very gradual, shift in Vermont agriculture as it not only opened up new markets but it also brought increased competition from western producers. As Vermont's farmers became increasingly involved with, and dependent upon, a competitive inter-regional market network, agriculture began to shift from a largely self-sufficient operation to a more distinctly commercial one.

One consequence of this shift towards an increasingly commercial agriculture was specialization in single-purpose operations such as dairying, stock breeding and, to a lesser degree, orchard farming. (See Dairy Farming, Stock Breeding, and Orchard Farming) Much more common than specialized agriculture during this time, however, was the return to a more limited form of diversified farming. Unable to compete in the former areas of beef, wheat, and sheep raising, farmers were forced to look elsewhere for a marketable product, and they often experimented with a limited variety of different operations.

Hops, for example, used solely for the brewing of beer, ale and other malted beverages, developed into a profitable crop in Vermont by the mid-1800s, particularly in the eastern and northeastern sections of the state such as Orleans, Windsor, Essex and Lamoille Counties. The town of Concord in Essex County, for example, was a large hop growing region, producing over 8,000 pounds of hops in 1860. By 1850 Vermont had replaced Massachussets and New Hampshire as the leading hops producer in New England, second only to New York in the nation as a whole. While most of the hops produced in Vermont were raised for out-of-state breweries, the actual bleaching, drying and baling of the plants during the September harvest took place on Vermont farms in specially constructed "hop houses." After 1870 hop production began to decline, largely as a result of crop infection, and by 1900 the "hops boom" had ended. After the Civil War, tobacco growing pushed north up the Connecticut Valley into southern Vermont and long, windowless, gableroof barns with slatted walls were constructed for drying and storing the leaves. However, tobacco growing was never extensive in Vermont, while it continued to be grown in considerable quantities just south of the border in northwestern Massachussetts.

It was also during this time that potato growers found new markets for their product. While surplus potatoes continued to be used in starch factories around the state, during the 1870s an '80s locally developed seed potato stock acquired national importance. Two Vermont varieties, the Early Rose, developed in Hubbardton around the 1850s, and the Green Mountain, developed in 1885, became popular in potato growing regions throughout the country. The Early Vermont was also a local variety, developed in West Rutland shortly after the Civil War. Orleans, Caledonia and, for a time, Franklin and Windsor counties, were the leading potato growing counties in the state, both for seed stock as well as for starch production. Prior to the 20th century, potatoes were typically stored in large wooden bins in house cellars, and occasionally in separate root cellars. However, as potatoes were sold increasingly for eating purposes, improved storage and packaging methods became necessary. Beginning in the 1920s special warehouses were constructed near railroad depots for these purposes. With the development of truck transport, many potato growers began to store their harvests on the farm. In this case, either a barn was converted to storage use, or a new warehouse was constructed on the premises.

Although beekeeping was practiced by some of Vermont's early settlers it was not until the development of commercial apple orcharding during the late 19th century that apiculture was undertaken to any significant degree as, aside from making honey, bees were used for the pollination of apples and other fruit trees. Consequently, beekeeping developed mostly in the orchard farming regions of western Vermont. In 1915 Addison County was the largest honey producer in Vermont with at least 12 beekeepers having more than 100 colonies each. J.E. Crane was the largest beekeeper in Vermont with 635 colonies producing 42,000 lbs. of honey each season, and shipping the product to New England cities, Chicago and London. Western Vermont continues to be the leading honey producing region in the state to this day, with Addison County containing the largest number of beekeepers.

Towards the end of the century, improved transportation and expanding urban centers in the northeast encouraged farmers to market more perishable foodstuffs such as butter, cheese, eggs, fruit, and vegetables. Vegetable gardening gained increasing commercial importance around this time. Improved methods of processing which developed during the Civil War, alongside a growing urban market and budding summer tourist industry, stimulated the growth of market gardening in the

late 19th and early 20th centuries. Sweet corn, snap beans, cucumbers and different kinds of berries and orchard fruits were grown for the canning, pickling, and jelly factories that were established in various parts of the state, particularly in Vermont's southern counties. Flower growing, too, developed into a popular commercial occupation as evidenced in part by the construction of special floral halls at county and state fairgrounds. Finally, maple sugaring continued to be a standard income producer for farmers engaged in both specialized, and semi-diversifed operations. As improved sugaring equipment was developed and maple sugar production increased, farmers began to construct special sugar houses for the processing operation as well as for the storage of equipment and firewood. (See Agricultural Processing)

As agriculture became increasingly specialized and subject to a larger network of competitive markets, in addition to experimenting with different agricultural operations farmers also began to pay more attention to improving and "modernizing" their farms in order to make their operations more efficient. Alongside experiments in crop and animal husbandry, new methods of feed storage were introduced, as well as changes in barn and outbuilding design. One result of these improvements was the reorganization of the farmstead on some farms. This reorganization took various forms, including moving existing buildings around, tearing down others and building anew, and in some cases, attaching the various farm buildings together to create an "attached" or "connected" farmstead. This was also the period when the Bank Barn type was introduced to Vermont farms. The Bank Barn underwent considerable experimentation and improvement during the latter decades of the 19th century, evolving into structures ranging from complex multi-story rectangular barns to the short-lived, but remarkable, round barn form. Beginning in the 1880s the silo made its first appearance on Vermont farms and, although received with some suspicion at first, it became a popular method of feed storage by the early 1900s. In the early 20th century, other outbuildings such as chicken coops, icehouses, and milkhouses were added to many farmsteads. In contrast to the early 19th century farm, which housed most of its operations under one roof, the latter part of the century witnessed the proliferation of different agricultural outbuildings, reflecting the diversity of operations practiced by many Vermont farmers.

During the early 1900s many of Vermont's farmers began to

focus more exclusively on dairying as their primary agricultural activity, particularly as the trend towards fluid milk production developed during the 1910s and '20s. (see Dairying) At the same time that the dairy industry was developing into a more intensive specialized operation, two relatively short-term specialty operations emerged during this period, namely, poultry farming and, to a lesser extent, mink and fox farming. Poultry farming, which was the more significant and long lasting of the three, developed into a profitable industry during the early years of the 20th century. While regional poultry associations were established as early as the 1870s, scientific methods of breeding and the systematic culling of flocks did not get underway on a consistent scale until the early 1900s. In 1912 the Vermont Department of Agriculture (VDA) issued an agricultural bulletin urging Vermonters to breed and raise high quality chickens as well as turkeys, ducks and geese because of the good markets in northeastern cities and the high yield and quick return possible with only a small investment. In 1936 poultry raising was reported by the VDA as the second largest source of income for Vermont farmers. The buildings used to house poultry on the larger poultry farms reflected the considerable growth of the industry as large, multi-level barns were constructed. In some cases, dairy barns were converted for use as chicken barns in which case additional floors were inserted, and numerous windows and ventilators added. The popularity of poultry raising during this period is perhaps most evident in the large number of smaller chicken houses, or coops, that were constructed on farms throughout the state between 1900 and 1940. After World War II, however, poultry raising fell into a gradual decline and many of the large barns have since been abandoned or removed altogether.

During the 1920s and '30s, partially in an effort to reclaim some of Vermont's abandoned hill farms, some attempts were made by the state to promote mink and, to a lesser degree, fox farming. Although there were some farms devoted solely to "fur farming," most of the people who invested in mink or fox raising did so as a supplementary business to create an additional source of income. Mink and fox were relatively easy to care for, requiring simple sheds for shelter and a refrigerated feed house where frozen meats were stored for their food. Each winter, after the animals were skinned, their pelts were shipped to New York State, mostly to the Hudson Bay Auction House. While fur farming was a risky business, mink raising was popular enough to warrant organ-

izing the Vermont Mink Breeders' Association in the 1930s. However, for many farmers raising mink and fox proved little more than a craze. During the 1940s, war-time transportation difficulties, problems of disease and the general risks involved in the fur business, discouraged most of the mink ranchers and fox farmers in Vermont from continuing their operations after the War. Today, there are no known fox farms, and only three or four mink ranches in the state.

Despite the prevalence of specialized farming during the first few decades of the 20th century, diversified farms continued to exist, though in dwindling numbers, particularly in those parts of the state which were not conducive to large-scale farming due to hilly terrain and rocky soil. During the summer months, such farmers found a market for dairy products, poultry, and fresh fruit and vegetables in the ever-expanding summer resident and tourist population. Potatoes continued to provide a supplemental income. Maple sugar, apples, cider and honey were also sold to both a local market, tourists and natives alike, as well as out of state. Hay provided a source of income in both local and out-of-state markets. Tree farming, particularly Christmas firs, also developed into a profitable sideline.

Today, as a growing number of farmers are finding it difficult to compete in the dairy industry, farmers throughout New England have begun to re-examine the possibilities and advantages of shifting from specialized agriculture to a more diversified mix of agricultural activities, focusing on products that are less easily grown out West and more compatible with New England weather, terrain, and markets.

(See also: Orchard Farming; Stock Breeding; Sheep Farming; Agricultural Processing; and Dairying)

2. Agricultural Processing, 1760-1941

Agricultural processing describes those farm products that were processed for commercial, as opposed to purely subsistence, purposes. It includes processing operations that were initially home-based but eventually moved to a centralized factory or mill setting.

The earliest forms of agricultural food processing were the making of "grist," maple sugar, distilled products and cider. Constructing a mechanism for the processing of wheat and corn was one of the initial concerns of the early settler. Prior to the erection of a commercial mill, the self-sufficient farmer constructed his own "plumping mill," a crude grinding mechanism fashioned out of a hollowed-out log or stump with attached spring pole and weight. Grist mills were built as soon as a settlement was large enough to support one; indeed, the first settlers sometimes offered free land to any man who was willing to build and operate a grist mill. Grist mills thrived during the late 18th and early 19th centuries when Vermont was the bread basket of New England, producing "an estimated annual surplus of 30,000 bushels as early as 1792." (Stillwell, p.99) Since water provided the principal source of power, grist mills were built on the banks of streams and rivers. If the water was too slow moving a dam was built to create the "head" necessary to power the large wooden water wheel. The rotation of the wheel generated the milling machinery used to grind and sift the grain. Although wheat production had begun to decline by the second decade of the 19th century, farmers continued to rely on the local gristmill for their family needs. By the mid-19th century, as farmers began to pay greater attention to the care and feed of their livestock, grist mills began to serve the growing local demand for custom milled livestock feed. Toward the turn of the 20th century, however, the combined factors of urbanization and the rise of large, centralized, fully automated grain and flour mills spelled the decline of the local grist mill.

Maple sugaring was an operation the settlers learned from the Indians, and made Vermont famous for both the quality and output of the product. As early as 1774, the town of Ryegate was producing maple sugar for sale, and by 1791 St. Johnsbury and Lyndon were producing large quantities and selling to both local and out-of-state markets. Maple sugaring was the Vermont farmer's first crop of the year, as it was gathered and processed during the spring thaw, just

prior to the planting of field crops. The process involves, very simply, the extraction of sap from the tree and boiling it down into syrup or sugar. The early method of maple sugaring took place outside where the sap was boiled in a large kettle suspended over an open fire. Beginning in the 1860s, methods improved as special sugar houses were constructed with chimneys and ventilators to allow for the necessary air circulation and ventilation. In the early sugar houses, kettles continued to be used and were placed over stone or brick arches rather than over an open fire. Kettles were soon replaced with "arch" and, later, "patent" evaporators, the former consisting of two shallow pans set over a brick or stone arch, and the latter a more sophisticated, metal arch with regulated feeding systems and compartmentalized evaporation sequences which combined to create a much faster means of processing the sap into syrup. As cleaner, more efficient methods of gathering the sap were developed such as the replacement of wooden buckets with tin or galvanized pails, constructing roads through the sugar bush, and employing oxen and horses to drive the sap sledge, the house was used for the additional purpose of storing the equipment and firewood.

By 1886, Vermont produced more maple products, for its size, than any other state. Prior to the 1890s, nearly all maple sap was processed into sugar. As cane sugar became plentiful, however, and the demand for maple sugar declined, maple syrup began to be processed in greater quantities. In January of 1893 the Vermont Maple Sugar Makers' Association was organized in Morrisville. Begun in part in anticipation of Vermont's maple sugar exhibition in the Chicago World's Fair, it was primarily established to promote improved, standardized methods of processing and marketing. In the 1910s maple sugar factories were established in order to facilitate mass-production and marketing of maple goods. As early as 1909, the Vermont Business Directory and Gazeteer listed a maple sugar manufacturer and dealer in the town of Newfane. Other known factories in Vermont include: Vermont Maple Orchards in Essex Junction (date unknown); Maple Products, Inc., established in Brattleboro in 1925; American Maple Products Corporation, established in St. Albans in 1934; the Welch Brothers Maple factory, built in Burlington in 1917; and the Cary Maple Sugar Company, built in 1919 in St. Johnsbury, one of the leading maple sugar centers of Vermont. The Cary Company, still in operation today, was described in an early account as "a large modern fireproof plant...the largest of its kind in the world." In addition

to making candy, sugar and syrup, maple sap was also processed for use by the tobacco industry to flavor their various products. According to a 1912 statistical report, Orleans, Franklin, Lamoille, Caledonia and Washington counties were the leading maple sugar producing counties in Vermont, with Orleans the leader in sugar production, and Franklin in syrup. Today, Vermont is the leading maple sugar and syrup producing state in the country.

Distillation was another early processing operation, and distilleries were found in nearly every town in Vermont in the early 1800s. Potatoes, rye, and barley were raised in considerable quantities for making liquor. The town of Cabot, for example, had as many as 12 distilleries before the temperance movement brought a sharp decline in the production of hard liquors in Vermont. Prior to 1816 Cabot was shipping whiskey to Portland and Boston, after which the market moved to Canada where the liquor was illegally smuggled to British soldiers. Breweries were built as early as the 18th century in Vermont, though sources indicate that they were much less common than distilleries.

The cider mill accompanied the distillery as another early village building type as the large quantity of apples in Vermont's settled areas rendered the drink both plentiful and, especially in its more potent form of applejack and cider rum or brandy, very popular. While cider mills were usually privately owned cider-making was often community effort and the mill was shared by a number of farmers. Even after temperance reforms of the 1840s and '50s stymied the production of apple liquors, cider itself continued to be a popular drink. Cider mills are listed in increasing numbers in business directories during the 1880s and '90s, as are cider manufacturing establishments.

Tanneries were, alongside grist mills and saw mills, among the earliest, and most common industries in Vermont in the late 18th and early 19th centuries. Prior to the 1830s, tanneries produced for a local market; during the '30s, increased regional trade between Vermont and other north-eastern states following the opening of the Champlain Canal in 1825 stimulated exports to out of state markets. Tanneries were built on streams or rivers as they required an ample source of water, both as a power source to operate the bark-grinding mill, as well as to fill the large, wood-lined vats where the hides were cleaned and soaked. The buildings used to house the tanning operation varied from a simple open

shed to a fully enclosed structure. During the latter half of the 19th century, the depletion of raw materials, and the centralization of the leather manufacturing industry outside the state resulted in the gradual decline of small-scale, local tanning processing in Vermont.

Wool processing constituted another of Vermont's earliest agricultural processing operations. Before textile mills became widespread, the various stages of wool processing occurred in at least two, and sometimes three different geographic locations: the family dwelling, the carding mill and the fulling mill. After the wool was sheared, sorted and cleaned at the farm it was sent to a local carding mill where it was blended, combed and straightened. The wool was then brought back to the farm where it was spun and woven into fabric, then given to the local fuller who was responsible for shrinking and thickening ("fulling") the fabric. Carding was either done by hand, or with machines powered by water; hence carding mills were not necessarily located next to water. Fulling mills, on the other hand, typically relied on water for their power, employing a large water wheel geared to a series of heavy oaken hammers which were used to beat the cloth for cleaning and processing. With the introduction of textile mills where all wool processing operations took place under one roof, fulling and carding mills gradually ceased to operate.

Though potato production suffered in the face of the temperance movement and the resultant abandonment or destruction of distilleries, it quickly became the source of a new industry that developed in response to the growth of textile manufacturing. Beginning early in the 19th century, starch factories, where potato starch was extracted for the "sizing" of clothing, were constructed in numerous towns in Vermont. A starch "factory" consisted of a building, or room, large enough to house the necessary processing equipment. The process was a simple one, and consisted of first grinding the potato to a pulp, then placing the pulp in a large vat where the water was drawn off, after which it was spread on racks to dry. The dried pulp was then broken up and sold. Potatoes began to be exported for eating purposes in the 1850s with the coming of the railroad, and by the 1880s they were used almost exclusively for eating and as certified seed. Between 1870 and 1890, the number of starch factories in Vermont dropped from 44 to 2. (see Diversified and Specialty Agriculture)

The Civil War stimulated the development of canning as a means of mass-producing and marketing farm produce. Until the close of the century canning was largely a home industry. Home garden plots produced ample vegetables for home canning and family use. The factory system of canning appears to have begun in Vermont during the 1890s when several canning factories were chartered with the state, and some farmers began to raise sweet corn, snap beans and cucumbers for factory processing. Known companies in the state included: H. C. Baxter & Bros., built in Essex Junction in 1902-3; Demeritt Company in Waterbury which was built as a sweet corn canning factory in 1900, with string beans added to its processing in 1908; finally, a corn canning factory was built in Randolph in 1906.

Jelly making developed on a commercial scale towards the end of the century when canning and food processing elevated the scale of production to a factory setting. The Vermont Business Directory of 1890-1 lists seven jelly manufacturers in Vermont, located in the towns of Chester, Chester Depot, Brattleboro, West Dover, Weathersfield, Springfield and Perkinsville. While the Chester Depot manufacturer is listed as processing "all kinds" of fruit jellies, the others were either cider or apple jelly manufacturers. (see Orchard Farming)

Finally, dairying has long been one of Vermont's leading agricultural industries, and until fluid milk began to dominate the industry in the 1910s and '20s, cheese and butter were the primary commercial dairy products. Prior to the development of the factory system for cheese and butter making during the late 19th century, dairy processing was a home-based activity delegated to the female members of the household. Cheese making was the more difficult task of the two. As it was made during the warm months of summer and much of the process required a hot wood stove, cheese making typically took place in the summer kitchen, a room located off the main kitchen so as to keep the rest of the house cool. Cheese was made by first heating the milk over the stove, then adding rennet, a secretion from the lining of a calf's stomach, which acted with the casein in the milk to form the curd. Once the curd had formed it was cut, reheated, salted, then finally placed in a wooden cheese press where any remaining liquid whey was pressed out. It was then stored for several days until the rind formed, after which it was waxed with paraffin and stored "down cellar" where it was left to age until it was ready to be sent off to

market.

Butter making was a somewhat simpler process. After each milking, the fresh milk was typically brought to the buttery or dairy room off the kitchen where it was poured into a series of shallow tin or ceramic pans. The pans were then placed on a row of shelves lining the walls for one or two days until the cream had risen at which point it was skimmed off the top and placed in a container where it was stored until it "ripened." When this occurred the cream was poured into a churn where the butter was made to "come" by having the cream thrown against the sides. The early churns were tall, cylindrical wood containers in which the cream was beaten with a wooden paddle. Later in the 19th century, other types of churns were developed, some of which were relatively small and powered by a hand held crank, and others of which were run by treadmill using a sheep or horse to rotate the churn. After the butter had reached a certain point, the buttermilk was drawn off and typically fed to the pigs. As not all the buttermilk had been removed, the butter was then typically placed in a sloping wooden butter worker where the remaining liquid was worked off with a wooden paddle and drained into a container at the base of the slope. Finally, the butter that was being sent off to market was packed in large crocks, firkins or wooden tubs and stored in the cellar until it came time to sell, and the butter for the family and local sale was often molded, stamped and wrapped in wax paper.

During the latter decades of the 19th century the factory system gradually began to replace domestic processing operations. With the coming of the railroad in the 1850s, and the invention of the iced butter railroad car in 1854, the marketing of dairy products was gradually able to develop into a year round operation. As a result of improved market access and a growing demand for dairy products in the expanding metropolitan regions of southern New England and New York, the scale of dairy production in Vermont grew considerably and factories were established, both private and cooperatively owned, where farmers could bring their surplus milk. Although the equipment used for cheese and butter making became increasingly sophisticated as the factory system developed, the actual processes remained fundamentally the same as those used at home. Since cheese kept well and was therefore relatively easy to transport long distances, it was the first commercial dairy product to be produced and marketed on a large scale. The first cheese factory in

Vermont was built by Consider Bardwell on his farm in Pawlet in 1864. Although cheese production in Vermont peaked in 1869 it was not until the 1870s that cheese factories began to flourish in the state. Butter making continued as a home-based operation until the 1880s when it, too, moved increasingly into the realm of the centralized factory system. One of the first creameries in Vermont was built in Jacksonville in 1886. During the next three decades creameries and the accompanying outlying skimming stations were established in practically every town in Vermont, with Franklin county as the leader in butter production. For those who continued to process at home during these years, improved equipment such as the cream separator and the power churn, which was generally used only on the larger dairy farms, relieved many farmers' wives of much of the time and labor involved. (see Dairying for more on the history of the dairy industry in Vermont, and see the "Milkhouse", "Cheese Factory" and "Creamery" sections under PROPERTY TYPES for more detailed information on the actual processing operations.)

Of the various agricultural operations mentioned above, the making of cheese, butter, apple and maple sugar products constitute leading agricultural processing operations in Vermont to this day.

(See also: Diversified and Specialty Agriculture and Dairying)

3. Sheep Farming, 1810-1910

Sheep farming in Vermont dates back to the 18th century when the state's earliest settlers brought sheep with them as part of their family agricultural operations. The early sheep were of English stock and no particular breed, and they were raised for the dual purpose of producing mutton and wool for the family. Beginning in the 1810s, however, sheep farming began to develop from a largely subsistence operation into an industry that would give Vermont national prominence, first for the production of wool, and later for its superior sheep breeding.

Several factors were responsible for the development of sheep farming in Vermont. The first occurred in 1810 when William Jarvis, American Consul at Lisbon, imported a flock of Spanish Merino sheep from the Royal Escurial flock in Spain to his home in Boston. The once carefully guarded Spanish Merino was available for export for the first time during the Napoleonic Wars as estates containing the famous breed were plundered and noblemen sold their flocks for much needed cash. Jarvis was among a group of far-sighted men who decided to bring a flock of Merinos to the United States, convinced that it would bring prosperity to the young nation. Having originally intended to sell his flock to various states, Jarvis ultimately decided to bring his entire flock to his farm in Weathersfield Bow, Vermont in 1811. Although other breeds of sheep were raised in Vermont, the Spanish Merino and the later Saxony Merino, popular during the 1820s and '30s, provided the basis of Vermont's reputation as a superior sheep state in subsequent decades.

A second factor that contributed to the rise of the sheep farming industry in Vermont was the decline in the production of grain during the 1820s. The combined problems of harsh weather, insect blight and the advent of western competition forced Vermont farmers to find other, more lucrative agricultural operations, and they soon discovered that Vermont's hilly terrain was far better suited to sheep than it was to wheat. In addition, extensive land clearance during the early years of settlement made an ample supply of pasturage readily available. If wool raising was to prosper, however, market access was essential. Consequently, the opening of the Champlain Canal in 1823 was critical to the success of sheep farming in Vermont as it gave wool growers access to the major urban centers of southern New England and New York.

The 1824 Tariff on Woolens, which raised duties on imported wool and woolen goods, provided another major impetus to the development of sheep farming. The tariff was written by U.S. Representative Rollin Mallory of Poultney, Vermont, and its passage was aided by U.S. Representative Charles Rich of Shoreham. Following the passage of this tariff, sheep farming developed in earnest in Vermont and the sheep population quadrupled over the next decade and a half.

The single most important stimulus to the rise of sheep farming was the development of the woolen industry in New England and the demand for better quality wool. While the largest wool manufacturers were located in states such as Massachussetts and New Hampshire, the number of woolen mills in Vermont tripled over a fifteen year period, rising from 33 in 1836 to approximately 100 by 1850. Woolen mills, like saw and grist mills, were located on a river or stream in or near the town center. Sheep were sheared once a year in May or June whereupon the wool was typically pressed, then stored in an attic or a designated "wool room" where it awaited a buyer. The wool was then sold either to the local mills, or to buyers from out-of-state who travelled throughout Vermont purchasing wool for the large mills elsewhere in the northeast. Wool was transported to market by wagon, or by canal boat to points south. When carried by boat, the wool was deposited at a storehouse or wool depot located by the steamer dock before it was loaded on to the vessel. Two known depots in the state during this time were located in Addison County, one in Bridport and the other in Shoreham at Larrabee's Point. A stone warehouse in the town of Benson in Rutland County is identical to the two depots in Addison County and probably served as a wool depot at one time.

For approximately twenty years, sheep raising thrived in Vermont. Not only are the climate and terrain conducive to growing wool, but sheep require little maintenance. Sheep barns ranged from crude wooden sheds on the smaller farms, to the more sturdy, combined hay and livestock barns on the larger ones. These animals fed mostly on pasture in the summer, and hay in the winter, with a supplemental diet of roots which were typically stored in either the barn or a stone root cellar.

By the mid-1830s Addison County had become the foremost sheep raising county in Vermont, boasting 373 sheep per square mile, the highest concentration of sheep of any county in the

United States. The town of Cornwall, moreover, contained more sheep per square mile that anywhere in the world! Rutland and Windsor counties were the second and third largest sheep farming counties in Vermont. Orange, Chittenden, Washington, Caledonia, Bennington and Windham Counties also had sizable sheep populations. By 1840 there were approximately 1.5 million sheep in Vermont, more sheep per capita than any other state in the country.

Wool growing in Vermont peaked in the early 1840s, despite the drop in wool prices brought on by the Panic of 1837. By the middle of the decade, however, the industry was already on the decline. This was largely a consequence of the repeal of the wool tariff in 1846, and the growing problem of western competition following the construction of the Pennsylvania and Ohio canals, and later railroads, which opened up eastern markets to western wool growers. The abundance of cheap land in the West rendered sheep raising a more profitable endeavor than was the case for northeastern farmers. As a result of these two factors the price of wool fell, prompting some sheep farmers to diversify their operations.

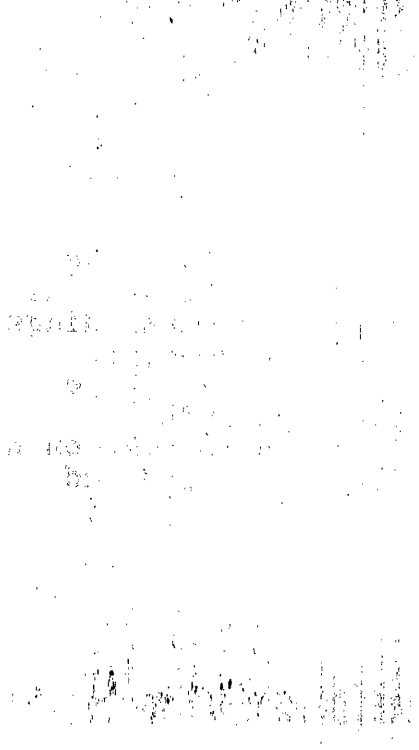
Although the number of sheep in Vermont continued to decrease over subsequent decades, both the quality and yield of wool per sheep rose proportionately during the 1850s and 1860s as sheep farmers began to focus increasingly on breeding in order to produce better quality stock. The more prosperous sheep farmers were typically located in the flatter, more fertile regions of the state such as the Champlain and Connecticut River Valleys. Sheep breeding brought great fortunes to some breeders as high quality Merino rams sold for as much as $3,500. The farms of successful breeders were virtual showplaces, containing elaborate houses and large, handsome barns. Some of the top breeders during this period included Merrill Bingham of Cornwall, Prosper Elithorp and E.R. Robinson of Shoreham, and Solomon Jewett of Weybridge. The man reputed to be the most successful Merino breeder in the history of sheep farming in Vermont was Edmond Hammond of Middlebury who is credited with having bred the first Vermont Merino, "Sweepstakes", in 1856. The so-called Vermont Merino, distinguished by the thickness and quality of its fleece, earned Vermont an international reputation as a sheep breeding state during the latter half of the 19th century. In 1863 Vermont Merinos achieved world-wide fame with their prize-winning appearance at the Hamburg Exhibition in Germany.

In the 1860s, the Civil War created a demand for wool blankets and uniforms which spurred a brief flurry of renewed interest in sheep farming, and Merino breeding reached an all time high. Following the war, however, the drop in currency and the surplus of wool and woolen goods, and the return of cotton production in the south, dealt wool growing in Vermont its final blow and most farmers sold their flocks to western sheep farmers and began to turn their attention to the more lucrative activity of dairying.

The few farmers who were determined to remain in the sheep farming business turned their attention almost exclusively to breeding. In the wake of the mass export of sheep to points west following the Civil War, a group of steadfast Merino devotees formed the Vermont Merino Sheep Breeders Association (1876) in an effort to preserve the reputation of the prize breed. This association served as the model for similar organizations that subsequently developed across the country. By this point the West contained a sizable sheep population and western wool growers had shifted their interest to a new type of sheep, namely, one with a balance of wool and meat producing qualities. Consequently, Vermont breeders began to look overseas for their markets and started exporting sheep as far away as Australia, South Africa and South America beginning in the 1870s. While sheep farming gradually declined during the closing years of the 19th century, a few Vermont sheep breeders continued to export their stock, and the last shipment overseas was made just prior to World War I.

In spite of the continuance of sheep breeding during the last quarter of the 19th century, by the 1870s dairying had largely eclipsed sheep farming as a major agricultural resource for the state. As the wool market declined, and the demand for dairy products in the expanding urban regions of New York and southern New England simultaneously rose, dairying soon proved a far more profitable operation than wool raising. While sheep farming was by and large abandoned for much of the 20th century, in recent years there has been a renewed interest in sheep farming in counties around the state for both meat and wool. In Addison, moreover, some farmers have even begun to raise Merinos again, which attests to the legacy of sheep farming in Vermont.

(see also: Stock Breeding)



4. Dairying, 1850-1941

Dairying has constituted an important part of Vermont's agricultural production since the early 19th century. However, not until the decline of the sheep industry in the late 1840s forced farmers to find alternative agricultural pursuits, and the coming of the railroad in the 1850s opened up new markets in southern New England and New York, did dairying develop into Vermont's leading agricultural industry. Dairying not only reinforced Vermont's importance as an agricultural state, but it also expanded the role of agriculture in the political arena at home, and brought Vermont to the forefront in terms of progressive agricultural legislation, education and organization in New England.

Until the latter decades of the 1800s dairying was, by and large, a seasonal operation. Transport difficulties and the distance from urban markets limited early commercial dairying in Vermont. Although surplus butter and cheese were shipped south from Vermont farms as early as the beginning of the 19th century, prior to the coming of the railroad and the introduction of the iced butter car in the 1850s, butter and cheese shipments could only take place on a limited basis. The butter and cheese produced during the warmer months were stored in cool cellars or spring houses until the cold weather set in, whereupon the larger farms shipped their excess stores to the city markets, and the smaller ones bartered their butter and cheese with the local merchants for various goods that could not be provided for on the farm. During the winter months cows were generally dried off and no butter or cheese was produced until the warm weather returned. It was not until improved market access and transport facilities were introduced, in conjunction with growing market demand and competition from other states, that dairying, and farming in general, was able to develop into a full-time commercial operation.

As cheese was the least perishable dairy product it was the chief dairy export during the early years of the industry. Prior to the Civil War, cheese-making was a home-based operation, generally delegated to the female members of the family. During the 1860s, however, the growth of the cheese market both at home and abroad and the resultant demand for high-quality standardized products led to the development of the cheese factory system in Vermont. The factory system was begun in New York in the 1850s and appeared in Vermont in 1864 when Consider Bardwell built the state's first cheese

factory at his farm in West Pawlet. Nonetheless, during the 1860s, when Vermont ranked among the leading cheese producers in the nation, cheese making was still largely a home-based operation. In fact, it was not until after Vermont reached peak production in 1869 that the factory system began to flourish. Most of Vermont's commercial cheese production was located in the southern half of the state in the counties such as Rutland, Bennington, Windham and Windsor. (see Agricultural Processing)

In the 1870s, butter began to replace cheese as the leading commercial dairy product, although it had been produced in considerable quantities since the 1850s. The use of iced butter cars on the Central Vermont and Rutland railways enabled Vermont dairymen to establish a year-round butter market between Vermont and southern New England. Butter making was initially a home-based operation; however, the growing urban market and the need for standardization, together with the introduction of the centrifugal cream separator in 1884, which greatly facilitated the butter making process, stimulated the development of butter factories or creameries, both privately and cooperatively owned, and the accompanying outlying skimming stations. The Babcock Tester (1890), which determined the percentage of butterfat in milk, and the power churn and revolving butter mixer (1893) further aided the mass production of butter. One of the earliest creameries in Vermont was the North River Creamery in Jacksonville which was built in 1886. By the 1890s as butter production soared, creameries could be found in nearly every town in in the state. Until the turn of the century, however, a large portion of Vermont's butter continued to be produced at home. The balance of home/ factory production in 1900, for example, was approximately 50:50. By 1900, Vermont was the leading butter producer in the U.S., and the Franklin County Cooperative Creamery in St. Albans was the largest butter factory in the world. The number of creameries in Vermont peaked at 300 in 1915 with a record output of 20,423,529 pounds of butter. (see Agricultural Processing)

As dairying developed into the leading agricultural activity in Vermont during the latter half of the 19th century, state agriculturalists began to make considerable strides forward in agricultural education, legislation and methods of production. While publicly sponsored county agricultural societies were organized as early as the 1840s, it was not until the latter half of the 19th century that any

significant organization of agriculture began. In 1863 the first State Agricultural College was incorporated by an act passed by the State Legislature, and it was subsequently joined with the University of Vermont in Burlington in 1865. Nearly 50 years later, the legislature chartered the Vermont State School of Agriculture in Randolph Center in 1910. The earliest dairying organization in both state and nation was the Vermont Dairymen's Association, founded in 1869. In 1871 the Vermont State Grange, the first subordinate branch of the National Grange in New England, was founded. Two years later, the Vermont Department of Agriculture, Manufactures and Mining was organized. The Vermont Experiment Station was established with the University of Vermont and the State Agricultural College in 1885. (See Agricultural Social, Educational and Political Institutions)

Partly in response to the continuing threat of western competition which had played a significant part in the decline of Vermont's beef, grain and woolen industries in previous decades, the various organizations and institutions promoted, among other things, improved methods of crop growing, animal husbandry, and the handling and processing of dairy products. In addition the expansion and specialization of the dairy industry at this time led to a growing demand for high-quality purebred dairy cows to replace the former all-purpose cow; hence this period marks the organization of numerous breeder associations throughout the northeast to promote breeds possessing different dairy qualities. Ayrshire milk, for example, was preferred among cheese makers, while Jerseys were considered the best butter cows. Windsor County was once the nation's biggest Jersey counties in terms of the number of registrations. With the advent of the fluid milk industry, Holsteins, with their relatively high levels of milk production, became a popular breed. The national headquarters of two breed organizations, Holstein and Ayrshire, are in Brattleboro and Brandon respectively. (See Stock Breeding)

Concomitant with these various developments was a growing concern with the design and function of farm buildings. As dairy farming became increasingly specialized, the buildings that housed the various dairy activities had to develop accordingly. Not only did the barns themselves grow more complex as the dairy industry placed greater demands on Vermont farmers, but the farmstead itself began to take on an altered appearance as new buildings of various shapes and heights were added to the landscape.

By the 1860s, for example, the Early Bank or "gravity flow" barn began to replace the former general purpose barn. Built into a bank the new barn had three levels instead of one, with a manure basement below, and stable floor and hay loft above. Another distinguishing feature was its use of additional fenestration such as stable windows and occasional gable openings to provide better lighting and ventilation for the herds. As the dairy industry grew, many farmers found it profitable to increase their herd size and the Early Bank Barn gave way to the Late Bank Barn which is essentially an enlarged and more complex version of the earlier barn type. These barns were typically three or four story structures, and often featured highdrives leading into expansive hay mows, interior ventilating systems marked by wood cupolas crowning the roof ridge, improved drainage systems, and additional windows. Around the turn of the century, the Round Barn first appeared on the Vermont landscape. Though interest in this type of barn was brief, and only a few were actually built, its striking shape and interior layout signalled a radical experiment in efficiency.

At the same time, new feeding methods were introduced to supplement the former diet of hay and pasture. Silos were first used on Vermont farms around 1880 as a means of storing corn for year round feeding. Initially located inside the main barn, by the turn of the century the silo was moved outside, and took on various shapes as it developed from a square tower, to a polygonal one, and finally to the cylindrical shape that is still used today.

Two other building types that came into use with the development of dairying were ice houses and milk houses, though neither type was common until the shift to fluid milk production in the 20th century. Icehouses first came into use on Vermont farms around the 1870s when a variety of deep setting methods were developed requiring the partial or complete submersion of milk containers in cold, preferably running water. Ice, both for the dairy and the household icebox, was harvested each January from a local pond, lake or river and stored in large squares in plain, windowless wood frame buildings. Although many farmers simply cooled their milk in a well or spring, a few farmers constructed a separate dairy house for such purposes. As early as 1875 the annual report of the Vermont Board of Agriculture encouraged farmers for whom dairying was the primary concern to build a "dairy house" containing a milk tank with cool running water

on the "shady side" of the barn or house. These small, typically single room buildings were generally either attached to the main barn, or built as a separate structure nearby.

During the early years of the 20th century, in response to the rising demand for milk in southern New England as urban centers expanded and milk producers were pushed further north, Vermont dairy farmers began to shift their focus from butter to the production of fluid milk. Bellows Falls made the first Vermont shipment of fluid milk to Boston in 1890. Soon afterwards, the invention of the refrigerated railroad car made shipments from more remote regions possible and the fluid milk industry began to spread further north over the course of the next three decades. Prior to the introduction of truck transport in the 1920s, milk plants were constructed along the railway lines for receiving and shipping purposes. In addition, as butter profits declined, and growing numbers of farmers shifted from butter to fluid milk production, many of the old creameries were converted to milk plants. The first regions to participate in the Boston milk market were in southern Vermont in counties like Windham and Windsor, then the central and western part of the state, with shipping stations in Bristol, Montpelier Jct. and New Haven Jct. Northwestern Vermont did not begin full-scale milk production until 1910-20 and most of the counties on Vermont's western border constituted part of the New York milk shed. One of the last regions to participate in fluid milk production was the northeastern section of Vermont where some farmers did not switch to milk until the late 1920s and early '30s.

Beginning in 1910, both Health Departments and milk handlers from states receiving Vermont milk began to set minimal sanitation requirements regarding the handling of milk both on the farm and in the factory. These requirements, which varied from state to state, resulted in a number of physical changes on Vermont farms as farmers were forced to comply with the new regulations. It was during this time that the concept of building barns into a bank with manure storage located below the dairy herd was considered unsanitary, and the Ground Level Stable Barn was introduced. This barn type was only two stories high and featured a concrete-floored stable at ground level and a hay mow above. Modern plumbing, and improved ventilation and manure disposal devices were also common features. In addition, milkhouses and icehouses became a standard part of the dairy farm operation.

Continuous improvements were made during these years in the processing and handling of milk, including the development of pasteurization and homogenization during the 1910s, the shift from delivering milk in tin quart cans to the more sanitary glass bottle around 1920, and the advent of truck transport, also around 1920, which greatly facilitated milk shipments from the more remote regions of the state.

Other developments during this period included the beginning of state testing of bovine tuberculosis in Vermont's dairy herds in 1917, first on a town and then a county and state-wide basis. Finally, the New England Milk Producers Association was founded in 1913 as the first cooperative effort on the part of New England milk producers.

Since the development of commercial dairying, farms have gradually declined in number while increasing in size and output. As the market grew increasingly specialized, and advanced technology and dairy regulations required more expensive equipment, the larger farmers located on the relatively flat and fertile soil of the Champlain and Connecticut River Valleys and other broad river valleys became more successful while several smaller hill country farmers went out of business. By the 1940s dairying had evolved into a highly specialized technology, a far cry from its supplementary role on Vermont's general purpose farms a century earlier.

While dairying continues to be Vermont's leading agricultural operation, it has become less lucrative, particularly for small-scale farmers, during recent decades. Rising capital costs such as the introduction of the bulk tank in the late 1950s have forced a number of farmers out of business. In addition, problems such as federal manipulation of milk prices, land development pressures and the attendant skyrocketing property taxes have driven many farmers to sell out, either to private developers or in accordance with the Federal Government's Whole Herd Buy-Out Plan of 1986 in which farmers were paid to export or slaughter their herds. Those farms that still operate are typically the larger, more prosperous farms, while growing numbers of smaller farms are unable or unwilling to compete. Where fifty years ago the Vermont farmer could generally count on one or more of his children taking over the family farm, that is no longer the case as the increasing financial strains and risks in dairy farming have rendered the occupation less and less attractive to the younger generation. Moreover, the start-up capital

costs of going into farming are prohibitively high. As a result, while higher production capability per cow has maintained production levels, there has been a dramatic reduction in the number of farms in Vermont. In 1954 Vermont contained approximately 10,000 dairy farms; in 1987 there were only about 2,700 dairy farms left in the state. Furthermore, statistics show that since January 1986 Vermont has been losing an average of four farms per month, a rate that has since increased. If this decline continues, it will not only result in the transformation of the rural landscape, but it will also alter the economic, and hence the social and physical character of the state as a whole.

(See also: Agricultural Processing, Stock Breeding, Diversified and Specialty Agriculture and Agricultural Social, Educational and Political Institutions)

5. Stock Breeding, 1793-1941

Stock breeding includes the breeding of high quality horses, cattle and sheep for both sale as stock and for specific pleasure or utilitarian purposes such as horse racing and dairy and wool production.

The history of stock breeding in Vermont dates back to the 1790s when Justin Morgan of Randolph Center advertised his colt for stud in 1793-4. The progeny of Morgan's horse made Vermont nationally famous in subsequent decades as the home state of the Morgan breed. However, it was not until the 1820s with the development of sheep farming that significant stock breeding occurred among other kinds of livestock. In the latter half of the 19th century, interest in stock breeding gained considerable momentum; as the dairy industry assumed national importance, breeder associations were established, and animal husbandry in general developed into an increasingly specialized, scientific vocation.

While Vermont never attained the status of an important horse breeding state, it did win national recognition for the development of the Morgan breed which continues to this day to be the most popular and distinctively local breed of horse in the state. The progeny of Justin Morgan's first stallion, "Figure", proved to be a hardy, compact horse with good speed, and suitable for a variety of uses including farm work, racing, and cavalry purposes during the Civil and First World Wars. In 1852 Daniel Chipman Linsley of Middlebury began studying the descendants of Morgan's horse, and wrote a book, The Morgan Horse, in 1857, the same year he began the Vermont Stock Journal. Joseph Battell, also of Middlebury, continued Linsley's research, publishing the first volume of the American Horse Register in 1894. In 1907 Battell gave to the U.S. Department of Agriculture his Weybridge farm, which was renamed the U.S. Morgan Horse Farm and turned over to the University of Vermont College of Agriculture in 1951. In 1909 the Morgan Horse Club was founded at the Vermont State Fair in White River Junction, with numerous affiliated clubs established throughout the country in subsequent decades.

Among other horse breeds popular in the 1800s were the Walkers, descended from Morgan Tally-Ho (foaled 1835), owned by William Walker of Hartland, and the Morrills, from Old Morrill (foaled c.1843), who was bred by James Heath of Walden. Popular in western Vermont were Hambiltonians. The sire, Hambiltonian (foaled 1804), was owned by Isaac Bishop

of Granville, New York, who kept the horse part time in Pawlet and Poultney. The sturdy "Vermont Cart Horse" became a favorite in northeastern cities as draft horses. This breed was originally used by stage companies in Vermont until the coming of the railroad, after which time they began to be bought up by express companies in the larger northeastern cities and gradually disappeared from Vermont altogether. Randolph and Royalton were among the leading towns in the driving horse trade, a business which continued to be an important source of income until the Civil War. Between 1840 and 1860 mule colts were raised in Vermont for the West Indies sugar trade. Heavier pulling stock were introduced in the later 1800s as F. A. Woodbridge of Vergennes imported several Percherons in 1884. The Vermont Stock Company, based in Shelburne, was founded in the 1870s to make quality-blooded horses readily available to state farmers for stud. The breeding of good saddle horses was further promoted by the Green Mountain Horse Association, founded in Rutland in 1926.

Interest in the breeding of other stock began during the 1810s when the emphasis in agriculture shifted from wheat to wool as Western competition and declining yields rendered wheat an unprofitable crop for Vermont farmers. In 1811 William Jarvis brought a flock of Spanish Merino sheep from the Royal Escurial flock in Spain to his farm in Weathersfield Bow, Vermont. The climate proved ideal for the several strains of Merinos that soon developed here, and, partly thanks to the favorable 1824 tariff on imported woolens, sheep raising became widespread throughout the state. By 1840 Vermont was the largest sheep raising state in the country with Addison, Windsor and Rutland as the leading counties. By 1850, however, as the price of wool declined, largely as a result of competition from other states and the 1846 tariff repeal, Vermont farmers began to shift their operations to dairying. Others simply began to farm more intensively and continued to make a profit as they improved both the quality of the breeds and quantity of wool produced per sheep. A renewed interest in wool growing occurred briefly during the Civil War years in response to the overwhelming demand for woolen blankets and uniforms. After the war, however, as demand fell sharply, most farmers sold their flocks, while those who continued to raise sheep focused their attentions entirely on large-scale breeding for stock purposes only. The Vermont Merino Sheep Breeders' Association was organized in 1879 and served as the model for similar organizations throughout the country. During the

1870s Vermont breeders began to export sheep overseas to places such as Australia, South Africa, and South America. While sheep farming gradually declined during the closing years of the 20th century, a few Vermont sheep breeders continued to export their stock, and the last shipment overseas occurred just prior to World War I. (See Sheep Farming).

Prior to the development of commercial dairying in the 1850s, most cattle in Vermont were of very mixed breeds, usually known as "natives," and were used for both milk and beef. As the market for wool gradually declined, farmers began shifting their efforts to raising quality cattle. With the coming of the railroads in the mid-1800s, purebred Devons, Herefords, Ayrshires, and Durhams were introduced to improve the local stock. Addison County "lake cattle" became preferred in eastern markets for beef, and in the 1860s and 1870s were also sent out West for breeding purposes. More important than beef during this time was the rapid rise of the dairy industry. This period witnessed the proliferation of numerous agricultural organizations and institutions to improve methods of production and marketing. In 1869 the Vermont Dairymen's Association, the first such organization in the country, was founded in Montpelier and was instrumental in promoting better breeding for increased yields. The University of Vermont's State Agricultural College and the Vail Institute in Lyndon further promoted the development of better breeds. Many of the late 19th century stock farms that were raising some of the state's finest horses were also breeding cattle. This was also the time when numerous breeder associations were established with the main office of two of the leading associations in the country located in Vermont: the Holstein-Friesian Association of America, founded in 1885 and moved to Putney in 1894; and the Ayrshire Breeders Association, organized in 1875 and moved to Brandon in 1882. Rutland County became well known for its Ayrshires, and in Sudbury the Polled Ayrshire breed was developed by the Whitaker family. Windsor County was once the nation's biggest Jersey county in terms of the number of registrations. Elbert S. Brigham, a former Commissioner of Agriculture, was one of the foremost Jersey breeders in Vermont. His herd, begun in 1913 in St. Albans, became internationally recognized for its exceptional breeding and dairy qualities.

During the last three decades of the 19th century a few large-scale farms were established by wealthy gentlemen

farmers who started these farms in part to emulate the lifestyle of the wealthy landed gentry of England, but also to improve the quality of livestock such as horses, cattle and sheep, and to a lesser extent pigs and poultry. As the interest in quality breeding coincided with the period when agriculturalists were making considerable strides forward in agricultural education, legislation and methods of production, both dairymen and stock farmers became increasingly concerned with the design and function of farm buildings. Stock breeders were often in the vanguard in employing the latest in agricultural building design and technology. Building expressly for the purpose of stock breeding, the owners used their resources to invest in large landholdings, the finest stock, and the construction of elaborate showplaces with large, modern barns containing the most up-to-date technological features. Among them were William S. Webb's Shelburne Farms, Willard S. Martin of Greatwood Farms in Plainfield (now Goddard College), Frederick Billing's Jersey farm in Woodstock, Joseph Battell's Morgan Horse Farm in Weybridge, H. C. R. Watson's Forest Park Farm in Brandon, Elmer Darling's Mountain View Farm in Burke, and finally Theodore N. Vail's Speedwell Farms in Lyndonville, which would later form part of the Vermont State School of Agriculture, chartered by the Vermont legislature in 1910.

The breeding and raising of quality stock continues to play a significant role in Vermont. Although sheep raising was all but abandoned in the early 20th century, recent years have shown a renewed interest in raising sheep in various parts of Vermont. Horse farms throughout the state continue to raise quality stock of a variety of breeds. Finally, throughout the 20th century dairy cattle have been continuously improved for higher milk production; consequently, dairy farmers, in order to keep abreast of competition, have had to invest increasing amounts in high quality stock to maintain adequate production levels.

(See also: Sheep Breeding, Dairying, Diversified and Specialty Agriculture and Agricultural Social, Educational and Political Institutions)

6. Agricultural Social, Educational and Political Institutions, 1800-1941

While societies to promote agriculture were established in this state as early as 1806, the development of Vermont's agricultural institutions did not occur to any significant degree until the 1840s. Market expansion and the growing tendency towards specialization, combined with the threat of Western competition and the exodus of increasing numbers of Vermonters, stimulated the rapid growth of agriculture-related social, educational and political institutions from the mid-19th century onward.

The Agricultural Society of Vermont was typical of the earliest agricultural organizations in the United States. Established in 1806 by a group of gentlemen farmers, the Society was more erudite than practical and consequently held little appeal for the typical farmer. In 1818 all twelve counties received charters for agricultural societies; however, these organizations were short-lived as the state refused to provide them with any kind of aid. Towards the mid-1800s Vermonters moved from practices largely aimed at local subsistence to increased reliance on, and competition within regional markets in specialized areas of agricultural production. This created a need to disseminate the latest agricultural improvements throughout the general farming community and gave rise to the first important agricultural institutions.

Agricultural organization and education in Vermont effectively began with the establishment of the first publicly sponsored county and state agricultural societies and fairs. In 1843, the Vermont Legislature responded to the petitions of farmers to provide matching funds to re-organize the county agricultural societies. With money to award premiums and prizes, county societies were re-chartered throughout Vermont, for the purpose of sponsoring annual fairs. Around the same time, farmers clubs or "lyceums" were also formed which held weekly meetings for social and educational purposes. Such meetings were often held in the local church vestry, school or town hall if no special building could be procured for them. In 1856, the Vermont State Agricultural Society was incorporated and began its annual State Fair. The site of the State Fair varied from year to year and was typically held in the larger towns such as as Rutland, Burlington, Montpelier, Brattleboro and St. Albans. Town or area fairs were also held in addition to the

state and county fairs. Prize competition at these various fairs promoted new stock and plant hybrids, new technologies, and improved agricultural processes. These clubs and fairs were extremely significant to the early development of Vermont agriculture, not only as educational institutions, but also as social opportunities. In bringing farmers together on both a local and state level, they reinforced a sense of community and common identity. Politically, the development of these societies provided an important forum for the work of the State Board of Agriculture which was created by the Legislature in 1870 to promote improved agricultural practice in areas such as animal and crop husbandry, and farm building design. While most of the county fairgrounds are no longer on their original 19th century sites, the fairs continue to be a popular agricultural and cultural event today with seventeen fairs sponsored annually throughout the state.

Accompanying the concern over improving agricultural yields and practices was a growing interest in agricultural education. While the Vermont House of Representatives expressed an interest in establishing agricultural instruction as early as 1849, it was the 1862 Federal Morrill Land Grant Act, written and sponsored by U.S. Representative Justin S. Morrill of Strafford, Vermont, that made the establishment of an agriculture-related educational institution possible. The Act made available funds from the sale of U.S. lands to create the endowment for an agricultural college in each state. The Legislature created the Vermont Agricultural College in 1863, and in 1865 the College was united with the University of Vermont in Burlington, largely because the money needed to create separate college facilities could not be raised.

As the marketing of agricultural products became more specialized and competitive after the Civil War, agricultural organizations around the country grew increasingly political as farmers felt a growing need for political representation and government protection. In 1869 the Vermont Dairymen's Association was founded as the first state Dairymen's Association in the country. In addition to its educational responsibilities, the Association was the first distinctly political agricultural organization in Vermont as it organized its own legislative committee to push for restrictions on the sale of oleomargarine, agricultural extension work, the regulation of creameries, and others.

The following year, in 1870, the Vermont State Grange was organized at the Union Schoolhouse in St. Johnsbury. By 1872 there were twelve subordinate granges throughout the State. Like the early farmers' clubs and societies, grange meetings were often held in public buildings dedicated to other uses such as schools, church vestries and town halls. It was not until the 1890s, a time when the Grange was becoming politically active for the first time and experiencing a rapid growth in membership, that local granges began to build their own buildings. While the Grange was never as politically active as the Dairymen's Association, both organizations were consulted by state legislators about the concerns of farm groups, and they each had an important influence on legislation to expand the role of the State Board of Agriculture, and to regulate railroads and the sale of oleomargarine. In addition, these groups almost continuously lobbied for an agricultural college separate from the University of Vermont, which resulted in improved agricultural education at the University. In 1878 the University's professors began to lecture at local farm societies, and in 1885 a full-time Professor of Agricultural Science was appointed and a State Agricultural Experiment Station established at the University. The Vermont Farmers' League was organized in 1890 and, for a brief time, played an active role in the fight for improved agricultural education. Finally, the following year a dairy school was established at the University.

In general progressive interest in education in the first decades of the 20th century led to a more practical, vocational approach to agricultural education. The transition from the more peripheral role of the gentleman farmer in agricultural education in the early 19th century to a direct and very practical one in the early 20th was manifested by the contributions of such men as Dr. William Seward Webb of Shelburne Farms in Shelburne, Willard S. Martin of Greatwood Farms in Plainfield (now Goddard College), and, most importantly, Theodore Vail, President of the American Telegraph and Telephone Company, of Speedwell Farms in Lyndonville. Although the establishment of these sprawling rural estates, with their elaborate farm complexes and vast landholdings, stemmed in part from a desire to emulate the wealthy landed gentry of England, it was also prompted by a genuine desire to promote agricultural progress. In addition to their own experiments in modern methods of farming, these men held tours and open houses of their farms and, more importantly, they lobbied for modern

agricultural practices and vocational education. The most significant contribution was made by Theodore Vail when, in 1910, he began a school of agriculture in connection with the Lyndon Institute of Lyndonville that was designed to provide both practical and theoretical training in agriculture. In 1915, Vail turned his vocational education program and his own Speedwell Farms, which was used as the school's practical training ground, over to the State.

The same year that Vail founded his agricultural school, the Legislature established the Vermont State School of Agriculture in Randolph Center. This was also the year that the Vermont Commissioner of Agriculture launched the "Better Farming Special." First developed in the midwest, the "Better Farming Special" was an educational program that traveled around the state by railway in cars containing exhibits on dairying, horticulture, forestry and other agricultural subjects. The "Specials" initially ran on the Rutland railroad and subsequently expanded to the Central Vermont Railroad as well.

The Vail school and its educational methods anticipated the Extension Service and agricultural and vocational high school programs in Vermont. In 1911 the first agricultural curriculums were introduced in Vermont high schools, and a 1912 act of the Legislature provided state aid for such instruction. Another act in the same year allowed towns to appropriate money to support the first County Agricultural Extension Agents, and in 1914 the Smith-Lever Act made matching funds available for this work. One result of this funding was the Vermont Agricultural Extension Service which was established in 1915 as a county based outreach program to provide practical information and services to farmers. The Federal Smith-Hughes Act of 1917 further supported these efforts, and by 1918 the County Farm Bureaus formed the Vermont State Farm Bureau which functions primarily as a political organization. The Farm Bureau was the spearhead of agricultural reform in Vermont under the New Deal during the 1930s and 40s. In 1919 the state provided funds for the local bureaus and to support county agents' work, home demonstration agent work, and boys' and girls' 4-H clubs.

As early as the 1890s the Dairymen's Association and the Vermont Grange were joined in their lobbying efforts for improved agricultural education by a host of producers' marketing groups: the Vermont Maple Sugar Makers' Association (1893), the Vermont Horticultural Society (1895),

and the Vermont Cooperative Creameries (1920). Bolstered by the political efforts of the Farm Bureau in the 1920s, these groups hammered out State agricultural policies in conjunction with the Legislature and the State Board of Agriculture on topics such as inter-state transportation and regulation of agricultural products, elimination of bovine tuberculosis, and increased funding for agricultural education. The union in 1941 of many of these organizations in the Vermont Cooperative Council for marketing, a strong emphasis on agricultural education at many levels, and an enlightened state agricultural policy are all part of the legacy of the efforts of these agricultural institutions.

(See also: Stock Breeding and Dairying)

7. Orchard Farming, 1820-1941

Orchard farming in Vermont is largely confined to the apple tree. Peaches have done well in Vermont's southernmost counties and in Grand Isle County, and hardy pears, plums, cherries, grapes, and quinces have long been grown on small-scale diversified farms. Yet these fruits have been grown with limited commercial success as they are relatively fragile and difficult to transport long distances, and they also fare somewhat better under different soil and climatic conditions. The apple tree, on the other hand, thrives in the local climate, and much of Vermont's soil is highly conducive to raising apples. In addition, the apple is a hardy fruit and easy to ship. Consequently, apple growing has played an important, if fluctuating, role in the history of Vermont agriculture since the early days of settlement.

Apple trees were grown on the earliest farms in Vermont. Immigrants from southern New England brought young seedlings with them and found the trees adapted well to Vermont's soil and climate. The traveling apple salesman was a familiar sight in early 19th century Vermont, and the large variety of apple types during this period was largely attributed to these salesmen. By the early 19th century most, if not all, farms had at least one apple tree to supplement the family diet, and there are records of small 18th century pear and apple orchards in Bennington County and the lower Champlain and Connecticut River Valleys.

Most orchards in Vermont during the first half of the 19th century were relatively small and unsystematically planted. They were typically located on or near farmsteads on sloping sites where they were protected from frost. Hedges often sheltered them against strong winds. Seedlings or small grafted trees were set out at widely spaced intervals, and the land around the trees was often kept under cultivation for maximum productivity. Corn, beans and buckwheat were standard orchard crops, all of which were harvested before the apples ripened. As the trees matured, they were pruned, mulched and fertilized. These practices have changed little over the past 200 years.

A portion of a family's apple stores was typically cut and dried for candy and sundry baked goods; however, the majority of the apples produced during the early 19th century were used for cider making and its various by-products such as jelly, vinegar, wine and brandy. Cider was a staple drink

for Vermonters and many community cider mills were erected in towns and villages around the state during this time. Cider was often made into the more potent form of cider brandy and in 1810 173,285 gallons of apple brandy were produced in Vermont's approximately 125 distilleries. Apples for home use were stored in the house cellar or separate stone cellar, while the surplus apples and apple beverages were generally sent to market.

Although apples were largely raised for family consumption, commercial orchard farming in Vermont started as early as the 1810s on Isle La Motte. Fall harvests were initially shipped by boat to Canada, and by mid-century Vermont was exporting a large volume of winter keeping apples to England and to the urban centers of the eastern United States, a practice that continues today.

In spite of the growing trend towards commercial orchard farming during the first half of the 19th century, the number of farmers raising apples for export was relatively small, and apple growing as a whole had begun to decline by the 1840s. Problems of soil exhaustion, tree aging, insect blight and periods of harsh weather combined to cut short the early success of orchard farming. In addition, temperance activists destroyed several orchards and brought an end to most of the brandy and cider business. By 1840 the number of distilleries in Vermont had dropped to two. The loss of this lucrative apple product, alongside a series of ruined crops and the increasing availability of southern fruits in Vermont markets during the winter months, discouraged most farmers from raising apples for purposes other than family consumption, and many orchards were either abandoned or cut down altogether.

At the same time that apple growing in Vermont was suffering a temporary setback, horticultural science in general was gaining a foothold in American agriculture, and various horticultural organizations were founded on the national and local levels. Around 1850 the Vermont Horticultural Society was founded, and renamed the Champlain Valley Horticultural Society in 1851. In addition experts began publishing reference books on horticulture. Chauncey Goodrich, for example, published his The Northern Fruit Culturist in Burlington, Vermont in 1849. During the 1860s the rise of agricultural periodicals also contributed to the dissemination of horticultural information. During the 1850s and 1860s a number of nurseries were started which advertised

a wide range of fruit varieties. Nurserymen built large packing houses with stalls around the perimeter for sorting young trees. These trees were usually destined for small home orchards where growing a range of varieties could prolong the season. A few 19th century gentlemen farmers also forced grapes and other fruits in heated greenhouses.

The period 1870-1900 was marked by a renewed interest in apple growing on the part of Vermont farmers. Improved methods of transportation, the introduction of new varieties for eating and cooking purposes, and the development of refrigerated storage on rail and steamer transport opened new markets for apple growers. In addition, better canning, drying, and packaging processes, in conjunction with a growing market for apples for eating and cooking purposes in cities throughout the northeast, encouraged more farmers to develop large-scale orchards for distinctly commercial purposes. Although the majority of Vermont's market apples still came from small diversified farms, several large 50-100 acre orchards were established in western and southern Vermont. Grand Isle County was the leading producer of apples during this period. Addison, Rutland, Bennington, Chittenden and Windham were also important apple producing counties due to their gentle rolling terrain, relatively temperate climates, and rich, porous soil. As orchardists set improved varieties with more careful and systematized planting and maintenance methods, they leased honey bees from local apiarists during blossoming season in order to ensure cross pollination. After apples were hand picked and graded they were stored in barrels packed generously with sawdust to ensure freshness. Barrels were used for packaging until 1932 when they were replaced with crates. After packaging, the apples were promptly stored in house cellars, stone chambers, or in special fruit or apple houses which came into use during this time as orchard experts encouraged the storage of apples in a well ventilated, frostproof, and odor-free environment. Most apples were sent to market before winter and were shipped by canal to western states, and by rail to points south. Shipments to England also increased at this time. Some of the most popular varieties included Baldwins, McIntosh, Rhode Island Greenings, Northern Spies, and Fameuse.

The 1890s marks the high point of commercial apple growing during this period as the science of apple growing, storing, and processing became more advanced. Refrigerated cold storage was introduced, thus enabling orchardists to preserve

their excess crops during the winter months. Later, in the 20th century, large central cold storage and packing plants were built in Putney, Shoreham, Brattleboro, Fair Haven, Rutland, and Grand Isle. Apple driers/evaporators were manufactured in Bellows Falls in the 1880s, considerably accelerating the process previously done by means of hearth, sun or kiln drying. Insecticide spraying was also introduced to Vermont orchardists during this period, though it did not come into widespread use until the 20th century. Finally, the Vermont State Horticultural Society was founded in 1896 in the agricultural building at the University of Vermont. The society served an important educational function, and its annual meeting brought experts from around the country to lecture on the latest in horticultural improvements.

By 1900 the orchard business had fallen into a second decline. Part of the problem was that, in spite of the various late 19th century improvements, Vermont apple growers on the whole were slow to modernize. In addition, the northwest had emerged as a major competitor in the eastern markets. Orchard experts, including the State Department of Agriculture, responded by encouraging farmers to take advantage of the expanding market just beyond Vermont's borders and to develop larger, more modern orchards to accommodate the growing demand for apples throughout the northeast. It was also suggested that farmers focus on raising a limited variety of apples and specialize in distinctively local apples less easily raised elsewhere. Starting in 1910, Vermont experienced a renewed, although tentative, interest in commercial apple growing. Apple growers hired teams of workers for the autumn harvest, relying on French Canadian pickers during the war years. In 1915 the "Apple Grading and Packaging Act" was passed setting standards for the packing, grading, and marketing of apples. The advent of the automotive industry in the 1920s provided considerable stimulus to commercial apple growing as truck transport facilitated marketing, and tractors aided the now widespread process of spraying. In addition, apple growers started raising larger crops of fewer, higher quality varieties. This was also the period when privately owned single-purpose mechanical cold storage and packaging plants came into use on some of the larger orchard farms. These consisted either of converted buildings such as dairy barns, or new structures built as inexpensively and cheaply as possible. By 1930 there were orchards ranging from 50-100 acres in nearly every section of the state except for the northeast. The largest orchard in Vermont belonged to Edward

H. Everett of Bennington. Started in 1911, the orchard is described in Arthur Stone's The Vermont of Today as "by far the largest planting in New England, and quite probably the largest privately owned apple orchard in America, if not the world." Called, simply, "The Orchards," Everett's planting included approximately 65,000 trees "located on the eastern slope of Mount Anthony and on Carpenter Hill in Pownal."

Though apple growing once again hit a low point in the late fifties, it has since increased, with the center of production in Addison County. While Vermont does not rank among the leading apple growing states in this country, orchard farming continues to play a role of relative significance in Vermont agriculture.

I. Name of Property Type Farmstead

II. Description

The historic Vermont farmstead usually includes a farmhouse, main barn, a series of outbuildings, well or spring house/box, barn and farm yards, orchard, vegetable garden, farm dump, paths and roads, pond or other natural source of water, and outlying meadows, pastures and woodlots bounded by fencing and hedgerows. Vermont farmsteads are generally not deeply set back, but are sited close to the road. They are found throughout the state, from the valley floors to mountainsides. Connected farmsteads are mostly located east of the Green Mountains.

For specific information on individual buildings within the farmstead, see individual entries in Section F under Associated Property Types.

The family dwelling was the center of the farmstead; it was not only where the family ate and slept, but it also served as the workplace for both agricultural and non-agricultural, domestic, and commercial activities. The farmhouse was where cheese and butter were processed, vegetables and fruits canned and dried, where household manufacturing activities such as weaving, spinning, leathermaking and other small cottage industries were located, and where the business records were kept. It was also the place where families and the extended "family" of the community gathered for various entertainment and cultural activities such as music-making, quilting and other kinds of "bees," and dances or "kitchen junkets." The farmhouse typically fronted the road, though very early (pre-1800) farmhouses were often built to face south, regardless of the orientation of the road. They also were often situated so prevailing winds took the farm odors away from the house.

During the 18th century agricultural processing and household manufacturing took place in the main dwelling, but after 1800 this work was more often located in an ell or wing. Frequently, the original dwelling became an ell if a larger farmhouse was added onto it. After 1850 it was common to build houses with extended ells. The ell typically contained: a summer kitchen, which served as the family kitchen during the warm months of summer in order to keep the main house relatively cool; a work space, which

might contain a laundry area, dairy storage, canning storage, a "loom room" or space for any other domestic manufacturing activity; farm laborers' quarters; grain or corn storage; and finally, a shed for wood, and possibly a privy and wagon storage. When fireplaces were the chief mode of heating and cooking, cellars beneath the main body of the dwelling often contained massive masonry or brick chimney supports. These were sometimes open arches and their interior was used for storage of various supplies and foodstuffs. In addition to the main farmhouse, there might be a second dwelling built for a hired hand or tenant farmer. These dwellings are typically smaller than the main house and have less architectural detail. Their location relative to the main house varies.

Next to the farmhouse, the main barn was the most important structure on the farm. It was the largest building on the farmstead, and typically housed livestock, hay and possibly grain. Other barns might include a horse/carriage barn, sheep barn and hay barn. One or more wells or springs provided a steady source of water. Outbuildings might include one or more of the following: corncrib, granary, poultry house, piggery, maple sugar house, root cellar (either free-standing or integrated into another building), pump/well or spring house, silo, milk house, workshop, garage, tool shed, machine shed, lard house, and icehouse. Privies, of course, were a standard farmstead feature; they were either separate freestanding structures or were built into the shed attached to the house. The freestanding privies were often moved about over time. Less common barns and outbuildings include apple barns, hop houses, ash houses, smokehouses, tobacco barns, cheese "factories" and creameries, lime kilns, and windmills or other power sources.

In addition to the buildings, the open space components of the farmstead such as the farm yards, fields and woods, also had specialized functions. Hubka describes the three-yard system--front, door and barn yards--as developing into a typical feature of many 19th century farms after 1820, a time when farmers were first beginning to reorganize the farmstead. The front yard served as the most formal of the outdoor spaces and might be bounded by a fence and/or the planting of shade trees. Hubka defines the dooryard as the space in front of the ell which served as an active outdoor workspace which "gathered the various labors" of the farm.

The dooryard generally faced south or east. Finally, the barnyard, located off the main barn, served as the livestock yard and was typically located on the south side of the barn sheltered from the cold north winds.

Other important outdoor spaces were the kitchen garden, which supplied the family with vegetables, herbs, and flowers, and a fruit orchard of some kind, usually apple. While the orchard was often located near the farmhouse, farmers occasionally planted fruit trees along the perimeter of their fields as well. Flowering plants were frequently planted near the house; besides their aesthetic function many they were also planted for medicinal purposes. "Marker trees" were often planted to commemorate important events such as marriage, childbirth or the building of a house.

In addition, the families' day-to-day domestic activities, agricultural and processing tasks produced one or more farm dumps which were generally sited in the woods at a distance from the farmhouse.

Beyond the central farmstead lay the fields and woodlots, connected to each other and to the action center of the farmstead by a series of paths, lanes and roads. Hubka describe a four-part field system as typical of the New England farm. The crop lands were located closest to the farm core and road, then mowing fields, then pasture, all of which might be bounded either by rows of hedges or trees, or by fencing as means of marking property lines, and keeping livestock out of the cultivated fields. Stone walls can sometimes be used to discern which fields were used for pasture, and which for cropland. According to a recent study, stone walls often separate different forest types which may indicate a former land use. Abandoned fields formerly used for pasture or hay, for example, tend to bear conifers, whereas former cultivated croplands frequently bear hardwoods. (Dorney, pp.97-98). In the case where trees line one side of a wall it generally indicates the side used for crop cultivation; where a plow would naturally have to stop just shy of the wall, animals often grazed right to the fence line. (Dorney, pp.78-9)

Ponds are a common feature in pastures and possibly mowing fields. The woodlots were located furthest out, and may not be contiguous to the rest of the farm. Their peripheral location bears no relation to the importance of their role

on the New England farm. Hubka's term for the New England farmer as "summer farmer and winter woodsman" illustrates how central woodlots were to the New England farm as farmers spent most of their winters in the woods, cutting timber for the local sawmill and cordwood for the stoves of family and neighbors. Sugar bushes were also very important on a farm. The maple trees tapped each spring in order to make maple syrup and sugar was, and continues to be, an important source of income for most farmers.

Fences were used increasingly during the 19th century as means of keeping livestock in and marking farmstead boundaries. Stump and stone walls not only functioned as fencing, but they were also by-products of land clearance. Where no fencing was needed, stones were simply placed in piles.

Variations:
A variation on the separate structures, or "detached farmstead" is the "connected farmstead" in which the main buildings--"big house, little house, back house, barn"--are all connected. This concept developed around the middle of the 19th century as a means of reorganizing and modernizing the New England farmstead without altering the basic agricultural operations to any significant degree. Connected farmsteads are most common east of the Green Mountains in eastern Vermont, as well as New Hampshire and Maine. Hubka attributes the occurrence of connected farmsteads on one side of the Green Mountains and not the other to the fact that western Vermont came into more contact with non-English, industrial, urban influences than did the eastern sections due to its proximity to New York's Hudson and Champlain Valleys. (Hubka, pp.23-24)

Hubka cites the primary motivating factor behind the building of these connected farmsteads as the decline of the New England agricultural economy due to effects of western competition and industry. It suited the mixed agricultural economy, and while it made the farm more efficient, it allowed for the retention of the traditional mix of operations. The connected farmstead design was also an economically viable means of modernizing the farmstead as it often simply involved moving around, or tearing down and reusing, existing buildings.

Some Finnish farmsteads in Ludlow contain early 20th century

saunas which are typically small, single-story wood frame buildings with a door, small windows, and possibly a chimney.

Changes over time:
Changes to farmsteads over time include: change in farm location and siting; technological changes; construction of more specialized outbuildings; tearing down of old, functionally obsolete buildings; moving or remodeling existing structures for new uses; lengthening the kitchen ell in response to growth of, and diversification in agricultural and domestic activities; fewer outbuildings and more consolidation; less marked delineation of the once formal front yard; the decline in the use of the family apple orchard; change in land use; changes in farm size; removal of fencing, hedgerows and orchards to make way for expanded field cultivation; the reversion of open land back to forest; the advent of municipal utilities, indoor plumbing (privies fall into disuse) and central heating (woodshed, wood-cutting is less essential); changes in labor force (i.e. switch from family labor to hired hands may result in building an ell or wing on to the farmhouse, or building a separate dwelling for the hired hand and his family); changes in the division of labor.

III. Significance

Intact historic farmsteads (50 years or older) are extremely rare since farmsteads change frequently in the types and placement of agricultural buildings. Technological, economic and social changes have rendered certain building types unnecessary or obsolete in which case such buildings might be destroyed, moved and/or readapted for new uses. Thomas Hubka, in his book Big House, Little House, Back House, Barn (1984), remarks on the frequency of building movement on New England farmsteads: "One of the most consistent patterns of building usage for New England settlers of all periods was to save houses and barns by moving and reusing them... The buildings that were reused were not saved in a spirit of nostalgic preservationism, but were unceremoniously readapted in a practical no-nonsense spirit of farm improvement and modernization. Massive interior and exterior reorganization was clearly the accepted societal norm." (pp.138-9) In spite of this frequency of change, however, the farmstead maintained its

basic character: a main dwelling and barn with a cluster of outbuildings, a well or spring house, yards, paths and roads, farm dump, kitchen garden, orchard, pond, and fields, pastures and woodlots bounded by fencing and hedgerows.

The number and variety of buildings that comprised the typical 19th and early 20th century farmstead reflected the diversity of operations that took place on most Vermont farms. As agriculture has grown more specialized over the past fifty years, however, the traditional type of farmstead has become increasingly rare.

The farmstead was the primary social and economic unit of life in New England for over a century. The New England farmstead, with its cluster of structures and specialized activity areas, derives from the English tradition of locating the various farm operations in separate structures. Farmers in 18th and 19th century New England retained this traditional form because it suited the region's mixed agricultural economy. After the opening of the Erie Canal in 1825, competition from the larger, more specialized farms of the West rendered New England farmers increasingly limited in the type and quantity of products they could produce. Consequently, instead of going in for large-scale specialization, New England farmers by and large retained their diversified operations, only now they operated with an eye toward an ever expanding, and increasingly competitive commercial network instead of the former practice of producing primarily for home and local consumption. The remaining decades of the 19th century were thus ones of considerable agricultural experimentation on the New England farm as flexibility proved a farmer's greatest asset if he was to continue to make a living off the land. As Hubka points out, "the continuous practice of outbuilding construction demonstrates the extent to which a changing agricultural context forced New England farmers to diversify their farm production system and constantly readjust their building organization." (Hubka, p.61)

Just as farmers tried a variety of different agricultural operations during this period, there was also considerable experimentation with the buildings themselves. As early as the 1820s, when the effects of western competition were first felt, agricultural experts began to devise ways to "modernize" the New England farm and make it more efficient. Not only did the individual farm buildings undergo a series

of modifications, particularly during the second half of the 19th century, but the farmstead as a whole was reorganized to some degree. Around 1850, for example, the attached farmstead idea developed as a model of efficiency in some parts of New England, mostly east of the Green Mountains. For the most part, however, the basic character of the traditional farmstead, with its detached cluster of barns and outbuildings, was retained.

With the growing specialization and technological sophistication of agriculture over the past 50 years and more, the average Vermont farmstead has undergone considerable alterations. As former sideline operations such as sheep, poultry and pig raising have been discontinued, the buildings used to house such livestock and their feed are no longer needed. Instead, a single large barn to house the dairy operation, and a few outbuildings such as equipment sheds and hay storage facilities are all that are needed. Specialization has also wrought significant changes on the agricultural landscape. The growth of the average herd size on most Vermont dairy farms has resulted in greater amounts of acreage devoted to the raising of livestock feed such as hay, corn and alfalfa; in the process, fruit orchards have been destroyed and stone walls and hedgerows removed to make way for more cropland.

IV. Registration Requirements

Farming in Vermont has traditionally been a diverse activity fluctuating with the seasons and with changing technologies, social patterns and market economies. Consequently, buildings and landscapes have routinely been reused, altered and moved to meet the changing needs of the farm. Farms in Vermont represent an evolution of agricultural techniques and social mores as farmers have routinely added new buildings to their collection of earlier structures and found new uses for their land. It is to be expected that on a typical Vermont farm one will find moved buildings, additions or alterations to structures, changes in use, demolitions and new construction, as well as changes in land patterns and use. These losses, alterations and additions are significant as they represent the diversity, evolution and ever changing nature of farming in the harsh Vermont climate. In general, the more "successful" a farm has been, the more likely the farmstead is to have undergone change over time. Eligible farms will range from abandoned but intact 19th century farms to working farms displaying a variety of new buildings and land uses.

The physical characteristics of the farmstead is as stated in the property type description. In general, properties meeting registration requirements should have been built and/or established on or before 1941 and the historic development of the farmstead should be clearly recognizable and understood.

There are a wide range of historic contexts that a farmstead may be eligible under and may in fact represent a number of them, as most farms in Vermont evolved over time. A farmstead should represent at least one historic context and should be evaluated within these contexts to determine whether it is a rare example of the type, a relatively common or good representation or a poor example of its property type. In some cases, detailed development of historic contexts at the local level may illuminate additional areas of local significance, which may make the farmstead eligible for the National Register even though it may not appear to meet these registration requirements.

Farmsteads will usually be eligible under Criteria A and/or C, and more rarely under Criteria B. Some farmsteads will exist solely as archeological sites and will be eligible

under Criteria D and/or A. With the changing nature of Vermont farming and the abandonment of farms, some outbuildings can be expected to exist as archeological resources.

Because farmsteads, by nature, are continually changing both in the collection and use of associated buildings and land, there will be many variations of the property type which will be eligible. Components of an eligible farmstead will include all or some of the following: a farmhouse, barn, outbuildings, and a surrounding parcel of land historically associated with the farm. Additions and new construction can be expected, particularly on working farms.

Additions, new construction, and relocation of buildings will not necessarily detract from a farmstead's eligibility. Due to the evolving nature of farm technology, social mores, and the diversity of farming in Vermont, additions and alterations to buildings, new construction, and the moving of buildings has been a traditional part of farm operation. Changes made since the historic period are often acceptable as they represent the evolutionary nature of farming in Vermont. However, these changes should not visually overwhelm the traditional structures and landscape to the point where the historic farmstead can no longer be understood.

In areas of the state where farming has not been a viable industry for several decades, it can be expected that local significance may play a more important role in determining the eligibility of a property. In these areas, farms with buildings whose structural integrity may be somewhat diminished may be eligible due to their being the sole surviving example of the property type in the area.

A farmstead need not retain integrity for all components of the property or in all areas of integrity. It will be necessary to identify what aspect(s) of integrity of a property are particularly outstanding. In some situations, certain aspects of integrity may play a greater role in a property's significance than others and may negate other areas of integrity that are less intact.

Location and Setting

While a farm need not retain all of its historic landholdings in order to be eligible for the National Register as a farmstead, it must retain a portion of them. The land immediately surrounding the farm buildings must be retained. There must be enough open land and farmyard area still connected to the buildings to convey a sense of the farming heritage of the property. In some areas it may be that the immediate farm complex and the bulk of the farmland historically associated with the farm are under separate ownership. Evidence of historic field patterns and agricultural operations is desirable and will add to a property's integrity and significance. This may include open fields, woodlots, sugarbushes, hedgerows, stonewalls, fencelines, lanes and roads, orchards and other cultural vegetation such as lilacs, locusts, maples, or elms.

New agricultural use of the historic landscape will not necessarily detract from the significance of a farmstead. Changing use of the land and its resources and changes over time in types of agricultural produce is part of the Vermont farming tradition and represents the diverse and continual evolutionary nature of the industry. The dynamic nature of a farmstead may result in new land patterns, such as second growth trees obliterating former fields or new ways of using the land. Development of farmlands may detract from the farm's significance if it overwhelms the historic farm buildings and erases any trace of the historic landscape.

Relocation or widening of roads may have forced moving buildings to a new location on the farm, thus changing the traditional relationship between the buildings. These changes should not necessarily disqualify the farmstead from National Register eligibility if it retains its integrity in most other areas.

Design

The integrity of the design of the farmstead's structures can be expected to vary based on the tradition of reuse and moving farm buildings, as well as the introduction of new buildings on working farms. Farms retaining a collection of buildings that all date from a distinct, limited period of significance, and are laid out in a pattern typical of that era, reflect agricultural practices from one particular

period of time and are especially significant.

Working farms or farmsteads containing buildings and landscape features representing differing eras of Vermont farming and farm technology are also significant as they represent the evolutionary history of farming in the state. These farms can be expected to have several periods of significance and may include a number of building types, some of which may be non-contributing but are necessary for the property to continue successfully functioning as a farm.

Additions to buildings can be expected as farms have traditionally grown and their organic nature may reflect the evolution of the particular farm operation.

If the farmhouse and/or barn are the most significant elements of the farmstead, the main blocks of these buildings should not have been greatly altered after their period of significance. The farm buildings must retain enough stylistic and structural features to identify them as being built during their particular period of construction.

While it is not required, the retention of the original layout or use of the interior of the farm buildings may add to the farm's significance. Evidence of traditional areas of domestic use within the farmhouse will enhance significance.

Materials

In general, buildings must retain most of their original materials and they must be relatively intact. If a significant number of the buildings are severely deteriorated, and therefore only marginally contributing, the farm would not be considered eligible unless there were some compelling local significance, such as the last remaining farm of a type. Extensive replacement of original materials with modern substitute materials will diminish significance.

Use of significant indigenous materials in farm buildings will enhance significance.

Workmanship

Some alterations to the farmhouse and main barn are expected and acceptable as long as the main block of each building remains relatively unaltered.

Workmanship may also be found in landscape elements such as stone walls. Intact examples of significant period draft technology, such as timer frame joinery, will enhance significance.

The tradition of reusing farm buildings for new purposes may lead to modifications in the original structural systems. Adaptive reuse of historic farm buildings will not necessarily alter their significance if the structures can still be understood as farm buildings and have not lost their significant historic features.

Association and Feeling

Associative qualities, while not required, will increase the significance of the property. These may include such things as the sights, sounds, and smells of livestock and crops which enhance the understanding of the property's agricultural heritage. A property should be given added consideration if it is still a working farm, as this serves to emphasize the historic role of the property.

A well documented historic record and/or extensive oral tradition of the farmstead can contribute to its informational value and historic significance. This type of knowledge will help assess the relationship of existing buildings and landscapes to the historic farm. It will help to understand how the property has evolved, how intact the landholdings are and how it relates to other farms in the area. Information and understanding of the local farming tradition may identify certain farmsteads as sole surviving examples of a type of farming within an area. These properties would be considered especially significant.

Criteria Considerations

Farms are likely to include properties as contributing resources that are generally excluded from the National Register.

Vermont farms traditionally contain structures that have been moved from one location on the farm to another. Because this pattern historically has contributed to the evolution of farming in the state, moved buildings may be included as contributing resources if one or more of the following apply:

- they are still on land traditionally associated with the farm
- they retain original materials
- they retain their traditional use
- they represent the history of agricultural, social and/or technological change on the farm

Family cemeteries are often significant components of a farm, particularly one that has remained in the same family for several generations. These properties may be included as contributing resources of the farmstead if they meet all of the following:

- they remain relatively intact and are clearly bounded
- the majority of stones are more than 50 years old
- they are clearly associated with the farm (contiguous open land should remain between the cemetery and the farm buildings)

While not required, the following qualities can add to the significance of a family cemetery:

- they represent traditional local burial patterns
- they provide a source of information regarding the residents of the property

The potential for archaeology to contribute to the understanding and significance of a farmstead should be considered. While full registration requirements still must be developed for these resources, historic archeological resources may be included as contributing resources on a farmstead. These types of resources may include foundations of houses, barns and outbuildings, former privies, dump sites, etc. These resources may provide further information regarding early phases of the farm's history as well as its social and technological development that is no longer evident in the built environment.

I. **Name of Property Type** Stock/Model (Gentleman) Farm

II. **Description**

Stock and gentlemen farms include those characteristics described in the Farmstead description although on a larger, and often much grander scale. In addition to the main house, or "manor," other expected property types include: housing for domestic and farm laborers, elaborate livestock barn(s), breeding barn(s), and carriage/horse barns, a show ring, creamery, maple sugar house(s), icehouse, corncrib, granary, spring(house)/pump(house), wells, privies, and greenhouse. Landscape features may include cropland, mowing fields, pastures, woodlands (including a sugar bush), ponds, orchards, stone and/or wood fencing, hedgerows, and flower and vegetable gardens. Gentleman farms are likely to contain elaborate landscape features, particularly around the main house, or manor. Gardens, fountains, pools, stone-laid walks, walls and patios, avenues of trees, yards, gardens, garden houses, and tea or summer houses are all fairly common features on the grand gentleman farms. In addition, farm dumps, and refuse deposits accompanying both domestic and agricultural activities are expected. Stock farms appear to have been largely concentrated in the Champlain Valley region, particularly Addison and Rutland Counties, although well known examples of large, gentleman farms also exist in Burke (Caledonia County), Woodstock (Windsor County) and Plainfield (Washington County).

For specific information on individual buildings within the farmstead, see individual listings under Associated Property Types.

Variations:
One unusual gentleman farm had orchard farming as its primary operation. According to Arthur Stone in his book The Vermont of Today (1929), "What is by far the largest planting in New England, and quite probably the largest privately owned apple orchard in America, if not in the world, is known as "The Orchards" and embraces approximately 65,000 trees. It is owned by Edward H. Everett estate of Bennington, started in 1911, and is located on the eastern slope of Mount Anthony and on Carpenter Hill in Pownal." The Everett estate is now Southern Vermont College.

Changes over time:
Stock and Gentleman farms had their heyday in the late 19th and early 20th century, but had begun to decline around the time of the First World War. By the Second World War most of these farms had either ceased their operations or were converted to other uses such as academic institutions and agricultural museums. Interior changes are expected in all surviving buildings, but especially in the manor house, resulting from the advent of indoor plumbing, central heating, use of smaller rooms, etc.

III. Significance

It is not known how many stock/model farms were established in Vermont in the 19th and early 20th centuries. Known model farms that have survived include William S. Webb's Shelburne Farms in Shelburne, Frederick Billings Farm in Woodstock, Willard S. Martin's Greatwood Farms (Goddard College Campus) in Plainfield, Joseph Battell's Morgan Horse Farm in Weybridge, and Elmer Darling's Mountain View Farm in Burke.

Although the history of stock breeding in Vermont dates back to the 1790s it was not until the latter half of the 19th century that farmers began to specialize in the breeding of stock to any significant degree. (see Stock Breeding context)

Purebred sheep, horses, cattle and, to a lesser extent, pigs and poultry, were the popular livestock raised on Vermont's stock farms during the latter half of the 19th and the early 20th centuries. Considerable fortunes could be made from the sale of purebred stock during this time; the profits were largely invested in the purchase of new stock, additional land, and in the construction of elaborate farmhouses and barns containing the most up-to-date features in design and technology.

Stock farming in Vermont ranged from the smaller well-to-do sheep, horse or cattle breeder to the very large model or "gentleman" farms. These larger farms were often established by successful businessmen who decided at some point in their career to own a large farming operation. Though few in number, they were distinguished from the more typical stock farm in their sheer size and the complexity of

their operations. Typically these gentleman farmers consolidated their landholdings by buying up numerous smaller farms in the surrounding area. William S. Webb, for example, bought up some twenty-five farms in the late 1880s to create his 4,000 acre Shelburne Farms. The Darling farm in Burke expanded its landholdings to 8,000 acres, making it the largest farm in Vermont. Alongside the purchase of numerous parcels of land, the landscape was often altered in the process. In the establishment of Shelburne Farms, for example, no part of the landscape was left untouched. Frederick Law Olmsted, designer of New York City's Central Park, was responsible for the design that included the construction of new roads, hills and groves to create a series of views and a sense of a vast, sprawling landscape.

In addition to their superior stock breeding operations, gentleman farmers such as Webb, Vail, Darling and Martin were interested in experimental agriculture on all levels; their farms included a wide variety of operations such as horticulture, crop husbandry, dairying, orchard farming and maple processing. While these men were distinctly progressive, promoting agricultural improvements and education through their own endeavors in modern farming, they also consciously emulated the wealthy landed gentry of England with their vast property holdings, model farm complexes and superior herds.

IV. Registration Requirements

I. Name of Property Type Apple Barn

II. Description

An apple barn is typically a two-to-three-level, wood-frame barn with either a gable or gambrel roof, and a stone or concrete foundation. Windows are a standard feature to allow for necessary ventilation, and they are typically double-hung sash windows. A ventilator, either crown metal, or wood cupola, might be constructed to provide additional air flow. The main entrance is generally at eaves center and, if necessary, is approached by means of an earthen or wood ramp for vehicular access. The entrance is wide enough to allow for the passage of a wagon through to the inside. For entrance into the basement level where the bulk of the apples are stored, additional entries can be found on either the gable ends or the opposite eaves side. A single chimney, placed at either gable end, might be constructed to regulate the temperature during the winter months.

The first air-cooled fruit storage structure in New England is the c.1890 apple barn built by T. L. Kinney on his farm (State survey #0705-36 South Hero, Grand Isle County).

Refuse deposits containing a large number of apple seeds and discarded machinery, whole or in pieces, may exist.

Variations:
Barns or other appropriate property types were converted to fruit storage. In such cases, alterations to the existing building that might occur include: the insertion of additional windows, and possibly additional floors; the construction of a chimney; closing up former entryways and opening new ones.

A few fruit houses have been found that were formerly used for other purposes: i.e. a barn and a church.

Changes over time:
Apple barns have been converted to stables and used for alternative storage purposes.

III. Significance:

Apple barns/fruit houses are located in or near an orchard, and are most likely to be found in Grand Isle, Addison,

Windham, Chittenden, Bennington and Rutland counties due the relatively high concentration of apple growing in those parts of the state.

As apple raising in Vermont developed on a commercial scale during the late 19th century, improved methods of handling and storing the fruit became a growing concern of orchardists. Prior to the 1890s, apples and other fruits were generally kept in house cellars, separate stone cellars, or storage pits; however, the inability to regulate the temperature with such storage methods led to the construction of special barns with the necessary ventilating and heating for the proper storage of fruit.

IV Registration Requirements

I. Name of Property Type Ash House

II. Description

Ash houses are small (average size 10'x10'), single story gable-roof buildings constructed of stone or wood frame, with no foundation, no windows, and a single gable-front entrance. In addition, lye stones may have been used in ash manufacture, and refuse deposits containing dense layers of ash are often present.

Variations:
While most ash houses were simply used for storage purposes, some may include a separate room for processing the ashes into potash. In this case, all that might be necessary is a mechanism for boiling the ashes and some means of ventilation, such as windows or an actual roof crest ventilator. Typically, however, potash processing took place outside of the ash house in a large iron kettle suspended over an open fire.

Ash houses may have served the additional or subsequent function of a smoke house.

References to the existence of town/village/community ash houses have been found; however, there is no information available at this time as to their characteristics, historic occurrence/survival or geographic distribution over time.

Changes over time:
Ash houses may have been used for storage purposes.

III. Significance

It is not known how common ash houses once were in Vermont. Since they no longer served a necessary function by the late 19th century, and as their small size limits adapting them to uses other than smokehouses, it is likely that most of these structures exist only as archeological sites today.

The ash house served as a storage area for ashes, procured from felled trees, which were used for making potash for soap, bleach and gunpowder. Potash processing was most widespread during the period of late 18th century settlement when vast tracts of forested land were being cleared. However, the existence of such structures dating to as late as the 1870s

attests to both their possible use on Vermont farms long after the early settlement period, as well as to the persistence of certain subsistence activities on many Vermont farms throughout much of the 1800s.

IV. Registration Requirements

I. Name of Property Type Smokehouse

II. Description

As the sole function of smokehouse is to surround the meat in a dense smoke, all that is necessary is a fireproof building with a chimney. Consequently, smokehouses are typically small, single-story, gable-roof buildings, constructed of brick or stone and possibly resting on stone foundations. There is generally a single gable-front entrance and a chimney.

Variations:
Occasionally smokehouses served the dual function of ash storage.

III. Significance

Smokehouses have probably never been a common feature on the Vermont farmstead as most farmers smoked their meats in a barrel instead. In addition the availability of commercial foodstuffs in the 20th century has precluded the need for smoking meats on the farm. Consequently, although smokehouses are occasionally found on farms today, they are an exceedingly rare property type.

Most Vermont farms in the 19th century provided their own meat supply. Smokehouses were constructed on farms as a place for curing the meat by means of dense smoke. The cured meat was subsequently stored in a cellar, or some other cool storage area.

IV. Registration Requirements

I. Name of Property Type Early Barn 1780-1900

II. Description

The Early Barn is a gabled, rectangular, eaves-front structure with only one floor plus hayloft, fieldstone foundation, and hand-hewn, mortise-and-tenon framing. The dimensions of this barn type were so commonly 30x40 that it is known by that name ("thirty by forty") by farmers today. Its framing chronology falls into two general periods: 1780-1840, and post-1840. The older barns tend to have larger timbers than the later barns- 12"x12" for example and there is much hardwood used such as beech and oak, mixed with softwood. Timbers are both hewn and sash-sawn (up and down). Riven braces (split logs, not hewn or sawn) are rare. Posts are often flared or "gunstocked" with double tenons on top for the girt and plate. The tie beams are hewn, and the rafters tapered. Long pieces of wood are often used, such as 40'x8"x11" plates, for example. A groove is typically cut into the underside of the gable plate to receive the first row of boarding. The bay widths are often irregular, for example 12'-13'-11'-12'. The roof pitch is steeper than the later barns (9/12), and the frame might consist of principal rafters and horizontal purlins, a system which was extremely rare after 1840. Some of the very early barns (pre-1800) may have had no sills, in which case the posts were footed on stones with mortised ribbon timber located approximately 12" up the post. Sills were often added later, but the ribbon and evidence of foot repairs may remain.

In the post-1840 barns there is less variation in timber size, and framing members are usually 10"x10" or, more commonly, 8"x8". There is less shaping of the timber, and the wood used is generally softwood. The use of softwood stemmed in part from the lack of available hardwoods by this point, as well as from the fact that softwoods (such as spruce) are stronger and more resistant to rot. While heavy framing timbers are often hewn, after 1870 the use of the circular saw for cutting the lighter members becomes increasingly common. Softwood generally requires simpler joinery than hardwoods; consequently, instead of the double tenon system used formerly, girts are sometimes dropped at the gables to stagger the joinery. The roof pitch is less steep than formerly, and framed with common rafters only.

Considered purely functional when built, the Early Barns were rarely clapboarded or trimmed in any way, but usually sheathed with vertical weatherboard. They have large, central or nearly central, eaves-front, double-leaf doors that often were later converted to single-leaf sliding doors, sometimes in both eaves sides. There are no other openings, though a long transom above the door sometimes lights the central area.

The interior plan of the Early Barn is tri-partite, with a central passage into which to drive a hay cart, or for storage of a carriage. Typically, the livestock were housed at one gable end, in an area partitioned off by a six foot wall with one or two doors. At the opposite gable end was kept hay, along with a small room partitioned off for another use, perhaps for a bull, chickens, or tools and equipment.

Refuse deposits containing architectural debris, agricultural trash and discarded implements may be nearby.

Although Early Barns are rare, it is expected that they will be found state-wide.

Variations:
Some early barns were constructed of logs.

Changes over time:
Early Barns were sometimes raised to accommodate manure basements, and have visibly extended corner posts. Early Barns with basements represent the transition to Bank Barn technology which occurred around 1850. In such cases, the Early Barn was typically moved to a slope, and the orientation was changed to gable-front, which necessitated cutting through the big tie beams on the gable ends. Other additions may also have been attached to accommodate a growing herd size during the late 19th or early 20th centuries. It is not unusual, for example, to see a Bank or Ground Level Stable Barn attached to an Early Barn, reflecting the considerable expansion of dairying in Vermont during the late 19th and early 20th centuries. Additions may often be added to the sides (lean-to shape) or to the ends.

III. Significance

Once a common sight on the Vermont landscape, there are very

few free-standing Early Barns remaining today. Most were replaced with larger, more modern barns beginning in the second half of the 19th century. Others were radically altered and were either placed over basements, or incorporated into larger barns.

The Early Barn was the barn type used by Vermont farmers during the late 18th and early 19th centuries, and its simple, functional design reflects the agricultural practices of that time. Unlike the later barns which were designed for operational efficiency and commercial production, the Early Barn was a general-purpose barn and was intended for basic animal shelter and storage purposes, housing the livestock and hay on the first floor, with additional space for hay storage in the loft above. While horses, chickens, sheep and pigs were sometimes housed in separate structures, it was not uncommon to keep all the livestock under one roof. Prior to the advent of commercial farming, farmers kept only enough livestock for their own needs, hence the barns were relatively small in size.

Often Early Barns survived late into the 19th century as hay/field barns, long after use of the barn type for livestock ceased. They are most easily identified by location: out in a field, far removed from the house or any roads.

IV. Registration Requirements

I. Name of Property Type Early Bank Barn 1850-1890

II. Description

Early Bank Barns are most commonly gable-front, two-and-a-half story barns with fieldstone foundations, and a large, central, double-leaf door to the main level served by either an earthen or wooden ramp. The gable-front drive-through design allowed for more convenient expansion than its Early Barn predecessor as the central drive could continue through to any rear gable additions. The main level contains stalls for livestock and possibly a section for grain and equipment storage, and a hay loft is located in the half story above. Rooms were sometimes partitioned off in the basement for the storage of root crops. After 1860, loading the loose hay into the barn was sometimes facilitated by a hayfork, a suspended, mechanical grappling hook on a sliding track hung from the ridge pole. The hayfork, formed of a pair of opposing three-prong forks, could be opened or closed, raised or lowered, and moved along the track by a mechanism of ropes and horse-drawn pulleys. The manure basement was usually accessed by a second double leaf door, often in the rear gable end, which opens out toward the fields, thus facilitating spreading manure. Manure basements, especially those under horse stables, were often used as pigpens.

Unlike Early Barns, door and window openings in Early Bank Barns can include pass doors (smaller doors for people), small stable windows to light the stable area (often one window per stall) and gable openings, which range from simple cut out openings to full 6/6 sash windows.

Early Bank Barn framing is mortise and tenon, usually a combination of hand hewn and sash sawn. Sash-sawn timbers were used until around 1870-80 when the use of circular-sawn (introduced c.1850) members in barns became more common. The barns are rarely clapboarded, but are sometimes trimmed with corner, frieze and lintel boards. Some Early Bank Barns connected to houses in continuous architecture feature the full stylistic trimmings of the house, invariably Greek Revival style, including returning box cornice, corner pilasters and peaked lintel boards. Though Early Bank Barns are relatively few in number, they can be found throughout the state.

Refuse deposits containing agricultural trash, discarded implements and architectural debris may be found nearby.

Changes over time:
Early Bank Barns typically have at least one and often a number of additions or alterations. Such changes not only reflect the rapid development of commercial dairying and the consolidation of greater numbers of livestock on fewer farms during the 20th century, but they also reflect the various regulations on sanitary handling and processing of milk, and proper maintenance of livestock. Milkhouses are perhaps the most common addition to Early Bank Barns and their construction was particularly widespread between 1920-40 in compliance with regulations requiring the proper storage of milk (see "Milkhouse" section of Property Types). Another common addition is the attachment of a one-story milking parlor, usually at the basement story. Milking parlors, large rooms built exclusively for milking, were first used on Vermont farms around the 1950s and are designed accommodate 8, 12, 16 or more cows at a time. The construction of milking parlors usually accompanied other construction on/in the main barn. Silos were almost inevitably added any time after 1879-80 when the first silo in Vermont is recorded as having been built, though later silos were constructed independently of the main barn (see "Silo" section of Property Types). Finally, in compliance with sanitation requirements established by milk processing companies receiving Vermont milk, many farmers shifted the stable area down to the former manure storage area whereupon concrete flooring was installed and additional fenestration inserted.

III. Significance

Though Early Bank Barns can be found throughout Vermont, the numbers are small relative to the number of Late Bank and other more recent barn types. This is partially due to the introduction of larger, more complex barn types that followed the Early Barn which prompted either the removal or the extensive alteration of the earlier barn.

While the Early Barn served the needs of farmers engaged in early small-scale diversified agriculture, by the 1850s the Early Bank Barn reflected changes in the burgeoning agricultural economy towards specialization, improved technology and increased efficiency.

The railroad, arriving in parts of Vermont in the 1850s, greatly expanded the market for farm products such as butter and cheese and provided increased incentive for farm efficiency. The improved cultural contact with other regions of the country also hastened the spread of new agricultural techniques.

An inherent problem with the Early Barn was the lack of storage space for manure, which was usually shovelled into a pile outside the barn. As the nutrients leached out from exposure to the elements, both the quality of the fertilizer and the efficiency of the farm were reduced. These single level barns also failed to take advantage of Vermont's hilly terrain. Thus, the Early Barn gave way to the Early Bank Barn, which is approximately the same size as its predecessor, was used in generally the same way, but is tucked into a hill to provide basement for manure, and direct access and upper floor for the livestock. These barns are sometimes referred to as "Gravity Flow Barns" because of the movement of hay from the loft to the main floor stables, and the manure from there to the basement. Often the existing barns were simply re-modeled into a gravity flow configuration with a basement inserted beneath, in which case they might be moved to a new site, and their orientation shifted from eaves to gable front.

IV. Registration Requirements

I. **Name of Property Type** Late Bank Barn 1880-1930

II. **Description**

A typical barn of this category is gable front, has one, two or sometimes three primary floors (floors used for livestock), and a steep gable roof often topped by one or more cupolas. Late Bank Barns are all of mortise-and-tenon framing, usually circular sawn rather than hand sawn, and ashlar (and later concrete) foundations more often than fieldstone. The predominant form seems to have been the upstairs cattle stable, and some are still in use today, although basement level cattle stables may have been equally widespread. While Late Bank Barns are often built into a bank, they are sometimes freestanding, with an upper floor served by a high drive from adjoining higher ground. A high drive (sometimes referred to as a "bridge," "dormer ramp" when enclosed, or "wharfin") can be an open or enclosed ramp that leads to a raised corridor intended as a passageway for a horse-drawn cart, or for cattle coming in from the fields. In common usage, the term "high drive" refers to an enclosed ramp that projects from the main barn. While early ramps tend to be constructed of solid earth, the open wood plank ramp came to be preferred as it prevented the build up of moisture in the stable area beneath the high drive entrance. Since some high drives were built at a later date than the main barn, construction details of both (i.e. timber size and dimension, and sawmarks) should be compared for morphological accuracy. All Late Bank Barns have "hay mows" -- large bins for hay storage, usually running the full length and height of the barn, that are loaded from the high drives. The specific arrangement of stables, hay mows and high drives, however, varies tremendously among Late Bank Barns.

One known arrangement is quite similar to the tripartite Early Barn configuration, though in larger, gable-front block. The primary level for cattle is entered by a large central door sometimes served by an open high drive. Along the left eaves side is a cattle stable, and directly below it in the basement level is manure storage. The basement level might also contain pig pens and a section for root storage. Below the high drive corridor, in the basement, is a horse stable. The entire right side is used as a large hay mow, extending into the hayloft in the attic.

Another known configuration has a high drive entering directly into the hayloft area, high in the gable peak. To either side of the high drive drop deep hay mows. Cattle enter the stable area, which is aligned below the high drive corridor, through a large gable end door that is sheltered by the high drive as it rises to the main block. The basement level, if there is one, can accommodate a variety of functions such as manure storage and horse stables.

A similar form, most commonly found in northern Vermont and possibly of French Canadian origin, has two eaves-front high drives -- a visually striking configuration that allows a farmer to drive his team in one and out the other, thus avoiding the problem of backing a team through a single high drive after unloading hay. An alternative configuration designed to facilitate the movement of the hay wagon can be found in many large barns and it consists of a single high drive with a trussed turn around at the end of the drive. Location of the wooden stanchions can be very helpful in understanding the original configuration of a Late Bank Barn.

An interior feature that occasionally occurs in a Late Bank Barn is one or two early interior silos, either underground or upright. Underground silos are likely to be square, stone-lined pits. Upright interior silos are built of wood and are incorporated into the framing system of one of the bays. In cases where Late Bank barns have had concrete flooring installed, any subterranean remains would no longer be evident in an above ground survey. Interior silos were used between 1880 and 1900 after which time silos tended increasingly to be constructed on the exterior of the barn (see "Silo" section of Property Types).

Following extensive experimentation on the multi-level, gravity flow concept, the Late Bank Barn period peaked for about twenty years, from about 1895 to 1915, and often produced incredibly large and complex barns. Some examples are quite tall, and combine careful grading with ashlar ramps and high drives to provide major access to three or more levels.

Round or polygonal barns represent a radical experiment in efficiency, with the stable radiating around a central silo for ease of feeding, and equal access to all cows for the milker, who was spared hauling milk down long aisles (see

"Round Barn" section of Property Types).

Compared to the Early Barn, many Late Bank Barns built after the turn of the 20th century are virtually dairy factories. These may include stables and pens for a variety of animals, interior silos, multi-level high drives with turn arounds, vents built into the walls from the floor to the open roof eaves, and equipment storage areas, as well as extensive architectural exterior ornament. Cupolas, for example, gave barns the picturesque quality desirable in the late 19th century, and provided much needed ventilation due to the heat produced by larger herds. They also provided access to the roof for repairs, and a suitable base for lavish weather vanes. Usually louvered, cupolas are square or polygonal, with hip, mansard or flared roofs, and are often the only decorative element on a Late Bank Barn. The limits of ornamentation however, were set only by the wealth and pretension of the owner. Indeed, some Late Bank Barns are as ornate as the houses associated with them.

The gambrel roof reappeared on barns around 1900, after an absence of a century, at first having only slight second pitches and resembling gable roofs. It enclosed greater volume than the gable roof, and was constructed with shorter rafter components. Around the same time, sheet metal came into use as a roofing material.

Late Bank Barns are usually the easiest to identify and date, although early examples sometimes resemble Early Bank Barns. Large size multiple levels marked by stable windows, steep, broad gable roofs, ashlar foundations and ramps, circular-sawn, mortise-and- tenon framing, and cupolas are the most common identifying features. The barns can be found throughout the state.
Refuse deposits containing agricultural trash, discarded implements, and architectural debris may be expected.

Changes over time:
Late Bank Barns typically have at least one and often a number of additions or alterations. Such changes reflect not only the rapid development of commercial dairying and the consolidation of greater numbers of livestock on fewer farms during the 20th century, but also the various regulations regarding the sanitary handling and processing of milk, and proper maintenance of livestock. Milkhouses are perhaps the most common addition to Late Bank Barns.

While some were built with the main barn, most were added later, particularly between 1920-40, in compliance with regulations requiring the proper storage of milk (see "Milkhouses" section of Property Types). Another common addition is the attachment of a one-story milking parlor, usually at the basement story. Milking parlors, large rooms built exclusively for milking, were first used on Vermont farms around the 1950s, and can accommodate 8, 12, 16 or more cows. The construction of milking parlors usually accompanies other construction on/in the main barn. Silos, if they were not built at the same time as the original structure, were almost inevitably added, though later silos were often constructed independently of the main barn. Finally, in compliance with sanitation requirements established by milk processing companies receiving Vermont milk, many farmers shifted the stable area down to the former manure storage area whereupon concrete flooring was installed and additional windows inserted.

III. Significance

Since many Late Bank Barns have not outlived their function and continue to serve the needs of the Vermont dairy farmer, they are likely to be found throughout the state of Vermont, although in steadily decreasing numbers. Many existing Late Bank Barns have undergone significant alterations over the years in response to economic, regulatory and technological changes that have occurred over the years.

The short-lived Early Bank Barn rapidly evolved into the diverse Late Bank Barn type during and after the Civil War. As the influence of writers such as Andrew Jackson Downing became evident in Vermont houses in the 1860s and their design and ornamentation were completely rethought, barns also drew increasing attention to design, both functional and decorative. Periodicals such as the American Agriculturalist, immediately following the Civil War, and books on barn and outbuilding design such as Halsted's 1881 Barns, Sheds and Outbuildings, promoted the concept of agriculture as a specific science which required specifically designed buildings.

By 1850, shifting agricultural practices brought about a number of important changes in the design of barns and outbuildings. The sheep raising era in Vermont encouraged farm consolidation during the 1830s and '40s, while the rise

of commercial dairying in the state after mid-century brought about a need for larger herds, improved livestock maintenance and more efficient methods of production. Together these factors combined to transform the barn from a simple shelter and storage space to a more complex and specialized building which, by the early 20th century, began to take on an almost industrial aspect on some of the larger, more prosperous farms.

The tremendous experimentation with barn forms during this relatively long Late Bank Barn period produced an incredibly diverse stock of multi-level barns, including large gable or gambrel roofed barns, and even round and polygonal barns. The Late Bank Barn may be the most numerous barn type in Vermont.

Late Bank Barns were distinguished from Early Bank Barns primarily by larger size, the introduction of the expensive bridge and highdrive, and by a higher degree of design complexity. This increased the potential for using multi-level and gravity-flow barn technology. In general, the more complex a barn, the later the date.

IV. Registration Requirements

I. Name of Property Type Ground Level Stable Barn
1915-1960

II. Description

Ground Level Stable Barns are long, narrow, rectangular buildings with walls no higher than perhaps 12', topped by massive flared gambrel roofs that comprise most of the building mass. Floors are concrete and always on ground level. Walls are of either balloon framing, modified post-and-beam framing, and sometimes mortice-and-tenon construction. Multiple wooden truss units, often prefabricated, form the expansive gambrel roofs, which enclose greater volume than gable roofs. Despite the possible presence of high drives to these attic areas, the concept of gravity flow, where several levels are in constant interaction, is no longer evident. By the 1930s it was generally accepted that manure storage directly below the stable was unsanitary. In the case where livestock were housed in the basement, the lack of sufficient light and ventilation was similarly unhealthy. Consequently, all operations were moved above ground with the Ground Level Stable Barn. This barn type is often sided with novelty siding, vertical planks, clapboards, or sometimes historic asphalt or asbestos siding. Each eave side is punctuated by a rhythm of numerous stable windows. Roofs, usually sheathed with sheet metal, corrugated metal, or slate, sometimes have exposed rafter tails along the eaves and ridges topped by crown ventilators (cylindrical, stamped metal ventilators with square bases and sometimes crowning weather vanes). Stables consist of long rows of metal pipe stanchions with an individual, automatic water trough for each cow on the outside, and a conveyor built into the concrete floor in the aisle for manure removal.

This simple design obviated several inherent problems of Late Bank Barns. The wooden Bank Barn floors, aside from being unsanitary, also required high maintenance. Animal wastes, which are high in ammonia, cause wood to rot quickly, and tales of cows falling through rotted floors and hanging from their stanchions illustrated the costs of neglect. These wastes also worked into the structural frame and contributed to the deterioration of some Late Bank Barns. Manure basements were also potentially explosive due to methane gas that accumulated if not properly ventilated. Also, horses as beasts of burden were gradually replaced by

Also, horses as beasts of burden were gradually replaced by machines, so horse stables were no longer required in barns, further encouraging simplified barn designs.

The plumbing and manure removal systems of the Ground Level Stable Barns reduced the amount of time that had to be spent with an animal, an important consideration as herd size continued to increase. By the mid-1950s many features of the Ground Level Stable Barn, such as concrete floors, metal stanchions, and the separation of cows and horses, were required by milk handlers receiving Vermont milk. Also required were milkhouses -- small, insulated buildings separated from the stable areas for storage of fresh milk until it was collected. These small gabled buildings are found on many Vermont farms today. They sometimes form small ells off the main barn and have roof types to match the main block (see "Milkhouse" section of Property Types).

Two of the most significant advantages of a Ground Level Stable Barn was its use of relatively low-cost materials and its ease of construction. By the early 20th century, large, material and labor intensive, mortise-and-tenon-framed structures became prohibitively expensive. The Ground Level Stable Barn consequently signalled the end of traditional mortise-and-tenon framing techniques, which had persisted over 50 years longer in barn construction than house construction.

Earlier examples of Ground Level Stable Barns (pre-1920) can sometimes be identified by the presence of square, Mansard-roofed cupolas in addition to crown ventilators. The roofs of the barns of this type became proportionately larger on later examples, providing larger hay storage capacity. By the 1960s, the gambrel roof on Ground Level Stable Barns had given way in some cases to rounded gable roofs, thus maximising interior volume.

Refuse deposits containing agricultural trash, discarded implements and architectural debris may be nearby.

Changes Over Time:
Alterations commonly found on Ground Level Stable barns include the addition of a milkhouse, a milking parlor (first used on Vermont farms around the 1950s), and possibly one or more wings to accommodate increased herd size or additional storage space. With the advent of milking parlors, the

stanchions in barns are often removed.

III. Significance

The Ground Level Stable Barn is a common barn type in Vermont. As Ground Level Stable Barns continue to serve the needs of today's farmers they have, by and large, been less subject to removal or alteration than the older Bank Barn type.

Despite the continued refinements made to Late Bank Barns into the early 20th century, a shifting domestic economy, combined with new regulatory demands on the dairy farmer, signalled the end of Late Bank Barn construction by 1930. The Ground Level Stable Barn accompanied increased farm mechanization and it has a one-level design intended to accommodate still larger herds. This type of barn is also efficient, cheap and sanitary. Many are still in use today.

IV. Registration Requirements

I. Name of Property Type Round and Polygonal Barns
c.1900-1917

II. Description

The round or polygonal barn is typically a 2 to 4 level wood frame bank barn with stone or concrete foundation, constructed around a central haymow or silo, and capped with a conical or hipped conical roof. The basement level is used for manure and possibly root storage. The second level contains the dairy stable where the cow stalls are arranged around, and facing in toward, the core silo or haymow in radiating sections. The third and fourth levels are used for hay storage, with the third entered by a high drive which continues along an interior circular drive built around the perimeter of the silo. Depending on the design, the hay is either dropped down through a central hay chute or, in the case of the central silo design, it is dropped through trap doors to the stable below. In the central silo design a round silo extends up through the center of the roof and features either louvered openings or windows and possibly a weathervane. Fenestration is regularly spaced around the stable area and marks each bay or, in the case of polygonal barns, each side.

In Caledonia County, noted St. Johnsbury architect Lambert Packard designed several round barns.

Round barns can be found in Orleans, Addison, Lamoille, Orange, Franklin, Caledonia, Grand Isle and Washington counties.

Refuse deposits containing agricultural trash, discarded implements and architectural debris may be nearby.

Variations:
Some round or polygonal barns do not contain interior silos; instead, the central space is used as a hay drop for the cows to feed from.

Changes over time:
Alterations may include the addition of a milkhouse, and the attachment of a one level milking parlor, as well as any other additions necessary to accommodate both the spatial and regulatory demands on the dairy herd. In compliance with a 1950s dairy regulation requiring concrete flooring in

the stable area, barns still in operation are likely to have had the stable area moved down to the basement and concrete flooring installed.

III. Significance

Due in part to their short time frame as well as to their experimental character, round and polygonal barns are a rare property type, not only in Vermont, but in the country at large.

Round and polygonal barns not only contribute a visually striking element to the rural landscape, but they also represented a radical experiment in efficiency during the late 19th and early 20th centuries. The stable radiated around a central feeding core and the milker was spared the hauling of milk down long aisles with equal access to all cows. In addition, round and polygonal barns were believed to have spatial advantages as circles, in theory, enclose the greatest area in relation to the perimeter.

According to a recent historical survey of round barns prepared in West Virginia, the first round barn in the United States was built by George Washington at his farm in Fairfax County, Virginia, in 1793. Another early round barn was built by the Shakers, a people famous for their ingenuity in creating striking functional designs, in 1824-8 in Hancock, Massachusetts.

It was not until the late 19th century, however, that the round barn was touted as a potentially useful and indeed progressive barn type by agricultural experts. Initially, the polygonal shape was popular as the round barn was considered too expensive to construct. By 1900, however, advancements in engineering and construction technology rendered the round shape both feasible and the more practical of the two. Accompanying the development of the round barn was the use of an interior round wooden silo instead of the central hay mow of earlier barns.

While round and polygonal barns met with initial success since they were relatively inexpensive to construct, labor efficient and able to withstand strong winds, they never achieved widespread popularity. The round barn type appealed to wealthy stock breeders and progressive-minded farmers, whereas the vast majority of farmers preferred to

design their barns in the traditional rectangular shape. In addition, it was soon recognized that the problems inherent in the basic design of round and polygonal barns outweighed their advantages. For example, the silo, if wood, was more likely to rot when placed at the center of the barn, and the strong odor of ensilage made any attempts at air purification almost impossible. Another problem lay in the obvious difficulty the shape presented where expansion was concerned. Finally, the shape was not as conducive to good lighting as the more narrow, rectangular shaped barn. Since dairy farmers during this time were becoming increasingly concerned with features such as proper light, pure air, flexibility and clean, durable surroundings, round and polygonal barns quickly went out of favor, though a few continue to be used to this day.

IV. Registration Requirements

I. Name of Property Type Horse/Carriage Barn

II. Description

The standard horse barns built during the second half of the 19th century are typically one and a half story gable roof buildings with clapboard or vertical board sheathing, and stone or concrete foundations. A double-door entrance is located at the gable center and is generally either a strap hinge or sliding door. The entrance is often flanked by two windows. Double-hung sash, sometimes featuring peaked lintels or other ornamental surrounds, occurs throughout the barn except in the stable area towards the rear which is illuminated with a row of small single-light windows, one per stall. A haydoor is often located over main entrance at the 1.5 story level, and there may be additional doors on the eaves sides and/or rear gable end. The rear section of the barn contains a stable area, which is entered by a single door, a harness room, and, if not located in the hayloft above, a grain room. The front half of the building is generally used for the carriage or wagon. Architectural embellishment varies from barn to barn and may include features such as central wall dormers marking the front entrance, decorative cross bracing on the entrances and hay doors, and the application of board-and-batten siding for exterior sheathing. Carriage barns associated with elaborate residences sometimes mimic the style and detailing of the house and might feature details such as a mansard roof, corner quoins, cornice brackets and other High Victorian details. One of the most common decorative features is a single cupola rising from the center of the roof ridge, which serves both aesthetic and ventilation purposes. The cupola, usually the single most elaborate feature of the building, often serves as an indicator of the owners' prosperity. Cupolas are either square or polygonal, contain louvered openings on each side, have either a hip, mansard or flared roof and are occasionally topped by a weathervane.

Horse barns can be found throughout the state, both on farms as well as in more densely populated residential areas. The most elaborate examples are generally located on former stock breeding farms and in conjunction with houses built by the wealthy in urban areas.

Refuse deposits containing discarded horse/carriage

equipment and architectural debris may be expected.

Variations:
Though the gable-front orientation is the most common, occasionally such barns are eaves front. In such cases the basic interior layout may be the same as that described above, or it may be designed in a bank barn configuration with the stable area in the basement, the carriage and granary area on the second level, and a hay loft above. Eaves-front carriage barns associated with large elaborate residences occasionally feature multiple entrance bays.

The plain gable roof structure with vertical board siding, simple front sliding or hinged door, few windows, and no cupola is the most basic and functional example of the horse barn or stable, and is most likely found on small farms.

Wagon sheds were a fairly common building type in the 19th and early 20th centuries. These differ from the horse/carriage barn in that they were used solely to house vehicles and harness equipment.

Changes over time:
When the car replaced the horse as the standard mode of transportation in the early 20th century these barns were often converted into garages or used for simple storage use.

Horse barns may be added on to over the years for additional storage or work space.

III. Significance

Since many horse/carriage barns have since been converted into garage, storage and even apartment space, they continue to serve a useful function. Consequently these types of barns can be found frequently throughout Vermont, both in rural areas as well as in more densely populated urban residential areas. While these conversions may significantly alter the interior, they generally leave the exterior intact.

Although horse barns have existed in Vermont since the early days of settlement, until the 1850s most farmers tended to house most or all of their livestock in one building. Typically, only the more affluent farmers went to the trouble of constructing a separate barn. It was not until

the second half of the 19th century, when horses began to replace oxen for farm work and transportation that the horse barn became a relatively common feature on the Vermont farmstead and began to take on features of a distinctive type. This type is sometimes referred to as a carriage barn since it often housed carriages, wagons and harness equipment as well. In addition to its place on the farmstead, this type is commonly found in urban residential areas which developed during the latter decades of the 19th century. In these locales it is either independent of, and set back from the main house, or attached.

IV. Registration Requirements

I. Name of Property Type Hay/Field Barn

II. Description

The hay barn is similar to the Early Barn in its basic form. It is typically a 30'x40' eaves front, one-and-a- half story, gable-roof structure with a stone foundation. It is often sheathed in vertical board siding with little or no embellishment of any kind. It contains either one or two large entrances with drive-throughs for the wagon, and hay doors are located on the upper level. The interior consists simply of an open storage space.

Hay barns appear to be fairly common farm buildings, while field barns are more rare. They appear to be fairly common in the Champlain Valley region (i.e. Franklin and Addison Counties).

Changes over time:
When the tractor replaced the horse in the early 20th century, there was no longer a need for field barns and most hay barns were either torn down, abandoned, or moved to the main farmstead. In the latter case, the field barn either maintained its original function, or it was attached to the main barn to provide additional hay, stable and storage space. In the not uncommon case where the same builder was responsible for the construction of both the field barn and the dairy barn, this task was a relatively simple one as the identical framing systems could be neatly integrated.

III. Significance

Field barns are more scarce today than they were in the late 19th and early 20th centuries as their function has since been obviated by the introduction of the tractor. Hay barns, on the other hand, are still relatively common farm buildings.

Hay barns were built to provide additional hay storage space, and they are a relatively common building type on Vermont farms. They can be found both in the main farm complex as well as in one or more hay fields, in which case they are sometimes referred to as "field barns." The main reason for locating hay barns in the fields was to relieve the work horses of the burden of transporting numerous hayloads on hot summer days across considerable distances to

and from the fields.

IV. Registration Requirements

I. Name of Property Type Sheep Barn

II. Description

The typical sheep barn consists of a two-level, eaves-front, gable-roof bank barn with a stone foundation. The sheep were housed in the ground or basement level which generally opened onto a pasture or sheep run with a southern exposure. The basement may contain a low ceiling for warmth, and an earthen floor. In addition, there may be a room used for root crop storage. The upper level, which is approached from the side opposite the sheep run, is generally double height and used for the storage of hay, which is dropped down to the lower level by a series of hay drops. Wool was generally stored either in the upper level of the barn, and in some instances barns featured a separate "wool room" for such purposes.

Sheep barns are most likely to be found in those areas where sheep were most extensively raised--Addison, Rutland and Windsor counties. To a lesser extent, Orange, Washington, Chittenden, Caledonia, Bennington and Windham counties were also significant sheep farming counties.

Refuse deposits containing agricultural trash, discarded implements and architectural debris may be nearby.

Variations:
Sheep barns are often simply open faced sheds with a southern exposure.

Changes over time:
Some sheep barns were converted to dairy or other purposes.

III. Significance

During the middle decades of the 19th century when sheep were raised extensively in Vermont, sheep barns likely occurred, in varying degrees, throughout the state. However, since the decline of sheep farming after the Civil War, and the shift from sheep to dairy cows, many of the former sheep barns have either been torn down, abandoned or converted for dairy use. There appear to be relatively few sheep barns identified and still standing in Vermont.

While dairying has been the state's leading agricultural

activity throughout the 20th century, the century previous was marked by Vermont's considerable reputation as a sheep farming state, first for the production of wool and then for the breeding of high quality stock. Though the "wool craze" was relatively brief, spanning the 1820s through the early 1840s with a brief revival during the Civil War, Vermont sheep farmers continued to raise quality-bred stock for export until the early 20th century.

One of the advantages of raising sheep is that they need very little maintenance, particularly where shelter is concerned. Although some kind of protection is needed, the more the sheep are exposed to the elements the thicker their fleece becomes. Little is known about the sheep barns built during the wool era in Vermont as most of them have been removed or altered for other uses. Nonetheless, it is likely that they were either open sheds, or simple timberframe barns containing few windows, a large open space at the ground level, where the sheep were housed, which opened onto a pasture or sheep run, and an area for the storage of hay and/or wool. It is likely that in some cases, sheep were housed in the main barn with the rest of the livestock.

When sheep farming shifted from wool to stock breeding during the latter half of the 19th century, the sheep barns constructed during this time tended to be somewhat more elaborate than those built during the wool era. In addition to their function as a shelter for livestock, the barns served a kind of status function. Sheep breeding was, for some, a very lucrative business, and wealthy breeders typically advertised their success with their barns, building large, sturdy structures crowned with ornamental cupolas. Nonetheless, while the appearance of some sheep barns grew more elaborate, sheep continued to be housed in much the same way as was formerly the case, that is, in a large open space with an earthen floor at the basement or ground level which opened on to a pasture or sheep run. As stock breeders often raised at least one other type of livestock, sheep barns were sometimes combined with, or connected to horse or dairy barns. For the most part, however, they were built as independent structures.

IV. Registration Requirements

I. Name of Property Type Fulling Mill

II. Description

A typical early 19th century fulling mill would be expected to have the following characteristics: a gable or shed roofed wood-frame building with tall, stone foundation (serving the dual purpose of providing a strong support for the milling machinery, and protecting the mill from rot and flooding due to its proximity to the water), a waterwheel, mill races, sluices or penstocks, fulling stocks, and fulling machinery (hammers attached to water wheel by a series of gears and shafts). There may be a dam, mill pond, former mill road and possibly a fuller's house associated with the fulling mill.

Additional physical remains might include: tenterhooks, discarded tools and machinery parts, cloth remnants, architectural debris, and possibly carding tools/machinery.

Fulling mills were located throughout the state during the first half of the 19th century. According to Steponaitus, during the 1820s carding and fulling mills had increased so much that "virtually no settlement was more than ten miles from such an operation." (p.41)

As fulling mills were market-oriented, and required an abundant water supply for their operations, they were typically sited on banks of streams or rivers, and located on or near a main road so as to be easily accessible to their patrons.

Fulling mills might be located near, or combined with a carding mill.

Changes over time:
After the introduction of textile mills, some fulling mills were converted into small-scale textile factories. Most were likely abandoned, destroyed or possibly converted to other non-textile milling functions.

III. Significance

Fulling mills were very common in Vermont during the first half of the 19th century. They first appeared on the Vermont landscape in the 1780s when seven fulling mills were

established. Their numbers multiplied over subsequent decades, reaching a peak of over 200 between 1815-25 when sheep farming in Vermont was on the rise. (Steponaitus, p.11) After 1850, due to the steady decline of wool raising in Vermont, together with technological improvements in processing machinery and the rise of the factory system of wool manufacturing where all operations took place under one roof, Vermont's fulling mills gradually went out of operation. The last known operating fulling and carding mill in Vermont was in Barton c.1910. (Steponaitus, p.102) Today, fulling mills exist only as archeological sites, although it is not known at this time if any of these sites survive.

Fulling mills represent the gradual transition of wool processing from home manufacture to factory production.

During the earliest years of settlement, textile manufacturing occurred primarily at home in the farm dwelling. Beginning in the 1780s "as the population grew and lifestyles improved, textile operations began to leave the home, small mills and eventually factories opened." (Steponaitus, p.1) Between 1780 and 1789 seven fulling mills were established in Vermont, including two in Bennington, one in Shelburne and the remaining four dispersed in between. This number multiplied over subsequent decades, reaching its peak in the 1820s when sheep farming in Vermont was on the rise and large-scale factory production was not yet widespread.

During this transitional period between home and factory production, the various stages of wool processing occurred in at least two, and sometimes three different geographic locations: the family dwelling, the carding mill and the fulling mill. After the wool was sheared, sorted and cleaned at the farm, it was sent to a local carding mill where it was combed and straightened. The carded wool was then brought back to the farm where it was spun and woven into fabric, then given to the local fuller who was responsible for shrinking and thickening ("fulling") the fabric. In Douglass L. Brownstone's A Field Guide To America's History the fulling process is described as follows: "At the mill, the woven cloth was placed in long troughs of warm water called fulling stocks. Heavy oaken hammers geared to the waterwheel beat the cloth thoroughly while the addition of soap or fuller's earth completed the

cleaning and processing. When the cloth was sufficiently fulled, it was spread out to dry on tenterhooks -- racks rimmed with hooked iron nails that held the cloth tight and prevented further shrinkage. The racks of finished cloth sat in front of the fuller's mill, conveniently serving as advertisements while they dried. The last step in fulling was raising the nap on the tautly spread cloth. Nature provided an admirable tool for this in the teasel, a plant whose flowering heads are filled with curved rigid bracts, making them perfectly suited for the chore." (Brownstone, p.104)

The most common power source for fulling mills was water, although the early, smaller mills may have used animal power. Mills converted water into power by directing it through a head race (the stone-lined conduit leading from the water source to the water wheel) and sluice or penstock (a pipe used for conducting water) to a water wheel which was attached to the fulling machinery. Once the water passed through the wheel it flowed into the "tail race" and back out into its original source. When streams were slow-moving a dam was constructed in order to provide enough head (the vertical distance between the head race and tail race) to increase the rate of flow.

IV. Registration Requirements

I. Name of Property Type Carding Mill

II. Description

Prior to the widespread use of mechanical carding machines, carding was done by hand and the early carding mills consisted of a simple shed. With the introduction of mechanical carding, a more substantial building was required to handle the carding machinery and power generation. These larger carding mills may have consisted of: a gable or shed roofed wood-frame building with tall, stone foundation (serving the dual purpose of providing a strong support for the milling machinery, and protecting the mill from rot and flooding due to its proximity to the water), a waterwheel, mill race, sluice or penstock, and carding machinery. There may be a dam, mill pond, and former mill road associated with the carding mill.

Other physical remains may include discarded tools, machinery, and architectural debris.

Carding mills were distributed throughout the state during the first half of the 19th century.

Changes over time:
Some carding mills were turned into small-scale textile factories after the demand for carding mills began to decline.

III. Significance

Some of the first known carding mills were established in Vermont in the 1790s in Middlebury, Hinesburg, Poultney and Woodstock (all three were combined fulling and carding mills). Their numbers multiplied over the next few decades, reaching their peak in the 1820s when they were located fairly evenly throughout the state, with Essex county containing the lowest concentration and the southeast corner of the state (Orange, Windsor and Windham counties) containing the highest. (Steponaitus, p.47)

After 1850, the steady decline of wool raising in Vermont, together with improvements in mechanical processing equipment and the rise of the factory system of wool processing where all operations took place under one roof, Vermont's carding mills gradually went out of operation.

The last known operating fulling and carding mill in Vermont was in Barton c.1910. (Steponaitus, p.102) Today, carding mills are most likely to exist as archeological sites, although it is not known at this time if there are any left in Vermont.

Carding mills represent the gradual transition of wool processing from home manufacture to factory production.

During the earliest years of settlement, textile manufacturing occurred primarily at home in the farm dwelling. Beginning in the 1780s "as the population grew and lifestyles improved, textile operations began to leave the home, small mills and eventually factories opened." (Steponaitus, p.1)

Carding mills served one of the functions in the various stages of wool processing prior to the widespread use of centralized textile mills where all stages were conducted under one roof. After the wool was sheared, sorted and cleaned at the farm it was sent to a local carding mill where the wool was combed and straightened. Mechanical carding machines were introduced in the early 19th century, although it is not known how widespread they were in Vermont. Carding mills were sometimes combined with fulling mills.

IV. Registration Requirements

I. Name of Property Type Wool Depot

II. Description

Wool depots are typically multi-story gable-roof buildings of stone or brick construction, located on the bank of a river, creek or lake. The eaves sides typically have blank walls, while the gable ends are marked by a succession of central loading doors flanked by a pair of windows at each story. Projecting loading hoists occur at the peaks of both gable ends. Refuse deposits containing agricultural trash and discarded implements may be expected.

Variations:
In addition to the major sheep depots, some of the country stores that took wool in trade had substantial wool bins.

Changes over time:
Wool depots have often been reused as a store and/or residence.

III. Significance

Wool depots were located on major waterways, such as Lake Champlain, and possibly on the Connecticut River. The decline of wool raising in Vermont beginning in the late 1840s, coupled with the transportation shift from the waterways to the railways in the 1850s spelled the decline of wool depots as a functional type. While some were removed, others were converted to retail, residential and possibly other purposes.

Today, wool depots are important historical markers of a short yet extremely prosperous period in the commercial and agricultural history of Vermont. Until the coming of the railroad in the 1850s, the major waterways (Lake Champlain and the Connecticut River) served as the key transportation routes for Vermont commerce, and improvements upon these routes during the early part of the 19th century were responsible for much of Vermont's early commercial development. The opening of the Champlain Canal in 1823, for example, not only provided access to an extensive network of markets for Vermont goods, but it also stimulated the rise of sheep farming in Vermont as farmers discovered a large market for their raw materials in New England's burgeoning woolen industry. Wool depots were essentially

lakeshore storage houses, where wool was brought by local sheep farmers and wool dealers for storage prior to shipping it to market by boat. The drop in wool prices resulting from outside competition and the abolition of the protective tariff on woolens in 1846 was in large part responsible for the decline of wool raising in Vermont by the late 1840s. In addition, the coming of the railroad at this time shifted transportation routes from the waterways to the railways, and storage depots built along the banks of former water routes no longer served a useful function.

IV. Registration Requirements

I. Name of Property Type Piggery

II. Description

Piggeries are typically small functional structures with little ornamentation, providing enough room for pig pens and occasional storage space above. Found throughout the state, they generally are gable-front structures of masonry or wood frame construction with stone foundations featuring a single front entrance, and, depending on the size of the barn, additional openings at the back opening onto a fenced-in space for the pigs. The interior is typically divided into pens. Additional features may include windows, ventilators on the roof ridge, and a hay door over the entrance marking the hayloft. Piggeries constructed contemporaneously with the dairy "gravity flow" barns may be constructed in a similar manner, that is, with pig pens located on the main floor, and manure storage and root cellar below, and hay, dried corn, and meal on the top story or stories.

Refuse deposits containing discarded implements, such as hog hooks and scrapers, and remnants of tubs for dipping carcass, as well as other agricultural trash, and architectural debris may be found nearby.

Variations:
Some piggeries consist only of a stone foundation with a roof and no intermediary walls. The more elaborate piggery may contain a system of underground feeders from other parts of the farm complex.

Changes over time:
Alterations may include an addition, whether a simple lean-to, a full wing or ell, or a change in function.

III. Significance

Pigs were once a standard feature on Vermont farms, particularly during the days when families provided most of their own food. Since pigs are no longer raised on the same scale as they were during the 19th century, and since many of the early piggeries were most likely crude wooden structures built for basic shelter, they are no longer as common as they once were and are likely to exist mostly as archeological sites.

Hogs and pigs were typical livestock on 19th and early 20th century farms. Pigs were often housed in the basement of horse barns. They kept the manure leveled off, worked over the manure for undigested horse grains, and kept warm in the process. Pigs and hogs were raised both for income and local consumption throughout the 19th century and they continue to be raised, although on a smaller scale, to this day.

IV. Registration Requirements

I. Name of Property Type Poultry House 1910-1940

II. Description

Poultry houses range from small, single story shed roofed structures to tall, multi-story buildings.

Since ventilation is perhaps the single most important consideration in housing poultry, the salient characteristic of poultry houses is the presence of windows and ventilation devices. A common poultry house consists of a long, narrow wood-frame, shed-roofed structure with south-facing windows closely spaced.

Small poultry houses might consist of a shed- or gable-roofed structure of one or two stories with stone or concrete foundation. The smaller structures generally feature a single entrance and one or two large windows for light and ventilation.

Refuse deposits containing agricultural trash, discarded implements, and architectural debris may be nearby.

Variations:
Some poultry houses are multiple-story wood-frame structures with gable or gambrel roofs and concrete foundations. Windows are either horizontal or vertically-hung sash and occur in a close, rhythmic succession at each story. The roof ridge is typically punctuated with a series of metal ventilators and/or dormers which serve as an additional means of maintaining the circulation of fresh air within the barn. Some houses feature a door at each bay on each story to facilitate cleaning the inside.

Dairy barns were sometimes converted to poultry houses. In this case intermediary floors were installed, windows inserted and additional ventilation devices built in. Occasionally, poultry houses consist of additions to the main dairy barn, in which case they are recognizable by the prevalence of windows and ventilation devices.

Some farms have different chicken coops for different types of birds such as young chicks, pullets, laying hens, and broilers.

III. Significance

Poultry houses probably occurred most frequently during the 1930s, 1940s, and 1950s when large-scale commercial poultry raising was at its peak in Vermont.

Since the 1950s interest in poultry raising in Vermont has steadily declined, and as a result there are relatively few poultry farms left in the state. Because poultry houses are specifically designed for poultry raising, their interior arrangement is not easily adapted to other other uses; many former poultry houses have thus been abandoned or destroyed.

Throughout the 19th century, most families in Vermont raised poultry. While they were raised primarily for home consumption, the surplus eggs and meat were generally sold for profit. Poultry raising never amounted to more than a sideline for most farmers, and was mostly confined to providing for the family's needs. In the early 20th century, however, poultry raising developed into a an increasingly commercial operation and it proved a lucrative business not only for poultry farmers, but for dairy and other farmers as well. During the 1930s, poultry raising was recorded as one of the leading sources of income for Vermont farmers. In conjunction with the considerable rise in both the number and size of poultry flocks being raised, the buildings used to house large poultry operations began to take on an almost industrial aspect in their scale, their overall symmetry, and in their ordered repetition of windows, doors and ventilation systems.

IV. Registration Requirements

I. Name of Property Type Tobacco Barn (drying barn)

II. Description

Tobacco barns are typically long, single-story wood-frame, gable roof barns with no windows and supported either by stone foundations or wood or stone piers. The pier supports not only provided additional air flow beneath the barns, but they are also indicative of the transient nature of many tobacco barns which were often moved about to different fields. Openings include large sliding door entrances at the gable front, and hinged, vertical ventilation slats located along the eaves walls. In addition, tobacco barns might feature wood ventilators on the roof ridge. Ventilators are either short, or they are full length and create a monitor roof effect. These ventilation mechanisms were used to control the amount of moisture in the barn. The interior of tobacco barns consisted of a large open space where the tobacco leaves were hung in tiers for drying. There was also often a space set aside where the tobacco was baled and stored, either for direct sale, or for transport to the sorting shop.

Refuse deposits containing agricultural trash, discarded implements and architectural debris may be found nearby.

Although tobacco cultivation was mostly confined to the southern part of the Connecticut River Valley, shade tobacco was grown as far north as Bradford in Orange County.

Changes over time:
Former tobacco barns have either been destroyed, abandoned or converted to other uses.

III. Significance

Tobacco barns are scarce in Vermont partly due to the fact that tobacco growing was never widespread in this state. In addition, the barns, while simple in their design, are nonetheless specialized enough so that they are not easily converted to other uses.

Commercial tobacco growing occurred as early as the 1700s in the Connecticut River Valley just south of the Vermont border. However, it was not until after the Civil War when tobacco growing reached peak production levels that it began

to spread north into Vermont where it flourished only briefly. Tobacco growing was one of a number of ways in which Vermont farmers diversified their operations at a time when a fundamental agricultural shift from sheep raising to dairying was taking place. According to a 1955 Vermont Life article, during the early years of the 20th century "Vermont ranked first among the 48 states of tobacco yielded per acre." (p.22) Moreover, Vermont was estimated to have approximately 500 acres in tobacco at the peak of its production. The towns of Vernon and Putney had the most acreage until the 1920s, at which point the town of Westminster became the leading tobacco town in Vermont.

Tobacco barns were located in the actual tobacco fields and were used for curing and storing the tobacco. The cured leaves were subsequently taken to a "sorting shop" for sorting and grading prior to their sale. Those farmers who did not have such a shop near or on the farm premises often sold their tobacco directly from the drying barn. Large farms owned by tobacco companies tended to construct tobacco barns in groups, often siting them in a long, gable-to-gable line. On the smaller tobacco farms, however, they were typically built singly.

IV. Registration Requirements

I. Name of Property Type Hop House

II. Description

Hop houses are typically long, single-story wood frame barns. While some were simply designed with enough room for drying, bleaching and baling, others contained a dormitory section for the hop pickers. Hop houses often contain some kind of ventilation device to allow the smoke and fumes to escape.

Refuse deposits containing agricultural trash, discarded implements and architectural debris may be nearby.

Hop cultivation was centered in eastern and northeastern Vermont in Orleans, Windsor, Orange, Essex, and Lamoille counties. The town of Concord was a large hop growing region, producing over 8,000 pounds of hops in 1860.

III. Significance

Hop cultivation was one of a number of ways in which Vermont farmers diversified their operations during the mid-19th century in response to major market shifts. Hops, used solely for flavoring and preserving beers, ales and other malted beverages, were grown in New England and New York in the early 17th century. During the 18th and early 19th centuries eastern Massachusetts and southern New Hampshire were the leading hop producing regions in the nation. Problems of insect pests and decreasing soil fertility in these regions led to a gradual decline in productivity, and by the 1840s hop cultivation shifted to New York and Vermont. The growth of an urban beer-drinking population and improved methods of transportation helped stimulate an interest in hop cultivation in this state, and since Vermont had few commercial breweries, hop growers shipped most of their harvests to urban markets elsewhere in the northeast. The peak of Vermont's hop cultivation occurred between 1850-70 when it ranked as the leading hop producer in New England, second only to New York in the nation as a whole. After 1870 competition from western hop growers and problems of crop infection and declining soil fertility brought a gradual end to hop cultivation in Vermont. At the same time, the expansion of the dairy industry provided farmers with a lucrative commercial outlet, and by 1900 Vermont's hop era was over.

Rarely, if ever, did Vermont farmers just raise hops; instead it was generally one of a number of diversified operations. An acre of hops was typical and four to five acres was considered large. Hops were cultivated in June. They were planted around tall wooden poles up to 20' high at 3-4' intervals, and strings were attached from the plants to the top of the poles for the plants to climb on.

Hop harvest began in early September before the first frost. Hops were harvested by placing the hop poles horizontally across two upright forked poles attached to a large wooden hop box. Two pickers typically worked at a box, picking the hops off the vine and placing them in the box. At the end of the day the boxes were gathered onto a wagon or stone boat and hauled to the hop house where they were placed into kilns to dry, then bleached with brimstone in a large iron kettle to kill any bugs still in the plants. The dried, bleached hops were then packed in large canvas bales and sold to dealers who in turn sold them to breweries. The vast majority of the hops grown in Vermont was sold out of state as there were so few breweries in-state. Occasionally hop yeast was sold locally for bread-making.

On some of the larger farms, young men and women from surrounding towns were hired to help with the harvest which usually lasted about three weeks, depending on the size of the crop. On a farm in Concord, Vermont the workers slept in a room partitioned off from the hop-kiln in the hop house, and they boarded at the farmhouse. When the last of the hops were picked a "hop dance" might be held in the farmhouse kitchen to celebrate the harvest.

IV. Registration Requirements

I. Name of Property Type Root Cellar

II. Description

Root cellars are of two types: integrated into an already existing structure such as a house, barn or outbuilding; and built as an independent structure, either freestanding and mounded over with soil or built into a hillside or bank. The first type typically features dry-laid stone partitions, a post-and-lintel entrance, slab ceiling and earthen floor.

The independent structures are typically rectangular chambers featuring random rubble construction consisting of laid up, uncut fieldstone of irregular shapes and sizes. The floors are generally earthen, and the ceilings consist of stone slab construction which are laid perpendicular to, and are supported by, the side walls, and laid parallel to one another. Often, there is a layer of stones placed on top of the slabs prior to depositing the top layer of earth. Most of the chambers are almost entirely covered with earth, leaving only the facade front section exposed. Root storage required proper temperature, ventilation, and the right degree of moisture to prevent the root crops from spoiling. While the use of masonry as a construction material satisfied these requirements to some extent, earth and sand were also necessary for insulation. The entrance is typically post-and-lintel construction, and located on the front wall which is often oriented towards the south or east. This facilitated the melting of snow in winter, and provided the best source of heat to prevent the stores from freezing during the cold months. The size of root cellars varies, ranging anywhere from approximately 5'-20' in length, 3'-11' in width, and 2'-7' in height.

Associated physical remains may include the farm house and outbuildings, well, roadways, fencing or retaining walls, and architectural debris such as wooden doors or door posts. Root cellars probably existed throughout Vermont while most of the stone root cellars are located in the hill country in the easternmost part of the state. They are often associated with late 18th or early-mid 19th century farm complexes.

Variations:
There is one known circular, three semi-circular, one square, and six known L-shaped stone root cellars in

Vermont. Three cellars have entrances not located on the front facade: one has a side entrance, one is entered through a triangular hole in the ceiling, and the other is entered by means of a stair. Two cellars feature ceiling construction other than stone slab: one contains a ceiling constructed of logs, and another features a ceiling of arched random rubble construction. Two chambers feature floor materials other than that of earth: one contains a bedrock floor, and the other a cement one.

In light of the relative scarcity of stone root cellars in Vermont, it is likely that most people used wood instead of stone construction. The frequent use of wood was most likely due to lack of sufficient building stone in certain regions in Vermont, as well as to the fact that it is an easier material with which to build.

III. Significance

Root cellars were probably a statewide phenomenon. Stone root cellars, however, appear to be primarily concentrated in the eastern part of the state in the Vermont Piedmont region where a readily-split type of rock, perfect for stone construction, predominates.

Unfortunately, the large characteristic stone roof slabs were frequently removed from abandoned root cellars and used for stone paths, steps, and patios elsewhere. Virtually all stone root cellars close to traveled roads were cannibalized in this fashion, quickly resulting in the destruction of this property type in the 20th century.

As sheep farming developed during the first half of the 19th century, farmers had to find a means of providing winter feed for their flocks. Although wheat and other grains continued to be raised after the general decline in their commercial production, adequate methods of storing grain for use during the winter months were not developed until the introduction of the silo in the 1870s. Roots, on the other hand, were easy to grow and store and they provided a nutritious source of feed during the winter months. They were stored variously in pits, in farmhouse or barn cellars, or in specially built outbuildings which were either integrated into an existing structure, or built independently into banks or hillsides, or built as isolated structures and mounded over with soil.

As house cellars were often considered too warm, and most barns did not contain cellars until after 1850, the use of pit and hillside cellars was considered the best means of storing certain kinds of foodstuffs during the first half of the 19th century. After mid-century, with the advent of the gravity-flow, or Early Bank barn, farmers more often stored their roots in partitioned areas built into the barn cellar instead of constructing a separate root cellar elsewhere on the farm.

During the last quarter of the century, as dairying replaced sheep farming as the mainstay of Vermont agriculture, modern methods of feed storage were introduced and ensilage superseded the use of roots for the feeding of livestock on most Vermont farms.

The root cellars are often outstanding vernacular examples of dry-laid, stone construction using large stone roof slabs. Although this type of construction was used for many other types of structures, root cellars, especially in eastern and central Vermont, commonly featured this particular style of construction.

IV. Registration Requirements

I. Name of Property Type Corn House/Crib

II. Description

The corn crib is one of the most recognizable buildings on the farm due to its distinctive design. The corn crib is typically a one or one-and-a-half story, gable-front structure resting on wood or stone posts to allow air circulation from beneath. The walls sometimes slant outwards toward the roof, and at least one wall is slatted to allow for additional air circulation. The purpose of the slanted walls is to catch the upward flow of air, as well as to keep rats from climbing up, and to prevent rain from coming though the slats. An additional rodent deterrent was sometimes employed wherein metal pans were placed upside down between the posts and the floor of the crib. There is usually a single, centrally located door at the gable front, and possibly a window overhead under the gable peak.

Refuse deposits containing corn husks and architectural debris may be nearby.

Corn cribs probably existed throughout the state, although they are likely to exist as archeological sites today.

Variations:
A corn crib may simply consist of a small gable front structure with one or two slatted walls for drying purposes.

Changes over time:
Corn cribs may have been reused for storage purposes.

III. Significance

Indian corn was one of the first crops planted by the Vermont settler in the 18th century. The crop not only provided feed for the livestock, but it was a staple of the family diet as well. However, it was not until the rise of commercial dairying in Vermont during the second half of the 19th century that Indian corn was grown on a large-scale and corn cribs, used for drying and storing corn on the cob, were probably a standard feature on the Vermont farm.

Prior to the Civil War farmers did not generally bother with building a separate building for corn drying, and instead used the floor of another barn for such purposes. In such

cases, barn walls where the corn was stored were slatted to allow for air circulation. With the substantial increase in corn cultivation following the Civil War the use of a separate structure became more popular. Constructing a building specially designed for the quick, safe drying of corn was generally considered preferable to the barn floor method since, according to Byron D. Halsted's 1881 book Barns, Sheds and Outbuildings, "storage in the garret is a very laborious business, and unless spread very thin, the corn is liable to injure by mold. Spread upon the barn floor it is always in the way, and free plunder to all the rats and mice upon the premises. Corn is more liable to injury from imperfect curing than any other grain that we raise" (p.128). Due to the size of its kernel, Indian corn dries far more slowly than other grains, and it takes months to completely dry. Open cribs or "rail pens" were sometimes used, though the fully enclosed and carefully designed closed crib, or house, was considered the best means of drying corn quickly and safely.

With the advent of machinery capable of harvesting corn by the kernel in the 20th century, corn cribs gradually became obsolete.

IV. Registration Requirements

I. Name of Property Type Granary

II. Description

Granaries are typically small single or one and a half story, wood frame or masonry, gable-roof buildings with stone foundations, and clapboard or vertical board sheathing. There is usually a single, central entrance and few or no windows. The distinguishing characteristic is the existence of openings, whether louvers, slats or metal grates, inserted in the walls to allow for plenty of air flow inside the building, and for protection from rodents. Grain is stored in a series of bins on the main floor, and any additional floor space is used for storage.

Refuse deposits containing grain and architectural debris may be nearby.

Variations:
Some farmers stored their grain in the farmhouse garret.

Changes Over Time:
Granaries may be converted for storage or other purposes.

III. Significance

It is not known when granaries were first used on Vermont farms, although it is likely that they came into more common usage with the rise of commercial dairying during the latter half of the 19th century. One of the common locations for grain storage on Vermont farms was a section of the main barn, typically in the hay loft area in a series of grain bins so the grain could be sent down a system of chutes to the stalls. In this case, the exterior wall of the granary section of the barn might be slatted to allow for additional ventilation in that part of the barn. One of the problems with storing grain in the main barn, however, was that the grain tended to attract mice and other rodents into the livestock area. To prevent this, many farmers built separate structures located away from the barn. Occasionally these separate structures might house pigs and/or chickens, but typically they functioned simply as grain storage barns.

IV. Registration Requirements

I. Name of Property Type Grist Mill

II. Description

A 19th century Vermont grist mill typically consists of a wood-frame or masonry building, two or more stories in height, located on the bank of a river or stream. It features tall stone foundations serving the dual purpose of supporting the weight and vibrations of the mill machinery and protecting the building from water damage. The main loading entrance is generally a wide door which opens on to a loading dock. Window openings may vary in size and placement, allowing enough light inside for the miller to work. The inside of the mill contains storage bins and milling machinery (the water wheel- may be interior or exterior, wheel pit, mill stones, hopper(s), gears, axles, shafts, bolting cylinder, and possibly a system of pulleys, ropes, a windlass, conveyors, elevators, blowers, etc.) The exterior features include: stone-lined head and tail races, penstock, and possibly a dam, and mill pond.

Other physical remains that might be expected include: discarded tools and millstones, machinery parts, abandoned mill roads, grain/meal/flour deposits, flour sacks and architectural debris.

Grist milling did not require a large labor force, and the mills were frequently operated by the miller and his family; consequently, any associated housing would likely include a miller's house near the mill.

During the first half of the century, at least, grist mills were ubiquitous in Vermont and few, if any, towns were without one. Since they rely on water for power, they are located on streams and rivers. Waterfalls and dams are often key indicators of the site of a former mill.

Variations:
Some of the larger mills were more automated, using a series of conveyors and elevators to transport the grain from one stage of the operation to another.

Steam, animal and wind power may have been used in some mills, though water power was the most popular.

Changes over time:
Grist mills that have been used into the 20th century are likely to have had their machinery replaced with more modern milling devices (e.g. power shifts to cast iron turbine to electric) Since grist mills were superseded by large, centralized industrial feed and flour mills by the turn of the century, many were abandoned or converted to different uses. Due to their proximity to water, many have been washed away by freshets and floods. Several 19th century grist mills have been restored and turned into museums. At least one grist mill in West Rutland has been turned into a feed store.

III. Significance:

During the late 18th and first half of the 19th centuries, grist mills were very common. They were used to grind both corn and wheat. Most towns and villages in Vermont had at least one. After the middle of the 19th century, the rise of large-scale centralized industrial flour and grain mills, and the increasing availability of store-bought flour gradually eclipsed the small, local grist mills. Moreover, due to their proximity to water sources, many of the early grist mills have been lost to freshets and floods. Today they are rare and exist mostly as archeological sites.

Grist mills represent the transition from grain processing as a home manufacture to factory production.

Grist mills were one of the earliest manufactories in Vermont. Built as soon as a settlement grew large enough to support one, grist mills were one of the mainstays of the agricultural community and they survived as long as farmers were producing grain for their own use. During the late 18th and early 19th centuries, Vermont was the bread basket of New England, and wheat was one of the primary cash crops for Vermont farmers. Historian Lewis Stillwell notes that "there was an estimated annual surplus in Western Vermont of 30,000 bushels (of wheat) as early as 1792." (p.99) Growing numbers of grist mills began to dot the banks of Vermont's rivers and streams, grinding flour for both export and local use. With the devastation wrought by the wheat midge and weevil during the late 1820s, however, the wheat belt shifted west and as early as 1830 Vermonters were buying flour from their New York neighbors. Although flour exports declined sharply, many farmers continued to raise cereal crops for their own use, thus

After 1850, as farmers began to pay greater attention to the care and feed of their livestock, grist mills began to serve the growing local demands for custom feed. With the coming of the railroad, western grain was shipped to Vermont in increasing amounts to be processed into animal feed. Around this time the local gristmilling process gradually changed over to a more automated one, utilizing a system of belts, pulleys, conveyors, and elevators to transport the grain and meal from one operation to another. Millstones were used until the early 1880s when milling with porcelain, iron or steel rollers came along, largely driving millstones from the scene.

During the late 19th and early 20th centuries, the combined factors of growing urbanization and the rise of large, centralized, fully-automated processors where grain was ground, and uniformly packaged under the same roof, spelled the decline of the local grist mill and its ultimate disappearance (with the exception of a few) from the visible rural landscape.

The Gristmilling Process:

The most common power source for grist mills was water, although some of the smaller mills may have used animal or wind power and a few larger, late 19th century mills may have used steam.

Mills converted water into power by directing it through a head race (a stone-lined conduit leading from the water source to the water wheel) and sluice or penstock (a pipe used for conducting water) to a water wheel. The water wheel was attached to the milling machinery consisting, at the very least, of a series of gears and shafts connected to the mill stones in between which the grain was ground, and the bolting cylinder where the flour and meal were sifted. Once the water passed through the wheel (in the case of grist mills, the "overshot wheel" was commonly used) it flowed into the "tail race" and back out to its original source. The amount of "head" (the vertical distance between the head race and tail race) determined the effectiveness of the overshot type of water wheel, the most efficient and commonly used wheel in grist mills. When streams were slow-moving, a dam was constructed in order to provide enough head to increase the rate of flow.

Very simply, the grist milling process went as follows: the farmer backed his wagon up to a loading dock where sacks of grain were unloaded then hoisted or carried up to the second story of the mill. The grain was then dumped into a hopper through which it fell between the mill stones was ground into flour and meal. The flour and meal fell from the mill stones directly on to a bolting cloth where it was sifted into a bin located directly below. The coarser meal might be fed through a wider weave of bolting cloth to sift a second grade of flour from the bran. The miller then shovelled the flour and meal from their various bins back into sacks to be returned to the farmer.

IV. Registration Requirements

I. Name of Property Type Feed Mill/Elevator

II. Description

Grain elevators typically consist of tall, multi-story, tower-like, wood-frame structures with flat, or shallow, gable roofs and concrete (or possibly stone) foundations. The upper floors are used for storage, and the mixing of grains takes place on the main floor. If the whole grain is ground on the premises, additional space is necessary for the grinding equipment. The building is generally sparsely fenestrated, and windows are typically large, multi-pane sash. In addition, elevators typically feature a warehouse attached to the main building which is where the bagged feed is stored prior to shipment, and an office, which is either located in the main building or it might consist simply of a small attached wing.

Pre-1940 grain elevators are typically located on the main rail routes, often in mill/industrial towns.

Refuse deposits containing agricultural debris, discarded implements and architectural debris are expected.

Changes over time:
Often new buildings are constructed to accommodate expansion, in which case new elevators and warehouses might be built alongside the existing ones.

III. Significance

The early grain elevators in Vermont mark the beginnings of local commercial grain production and distribution in the state. Grain elevators are used for the storage and mixing of feed for commercial sale. The early elevators were built along railroad lines and were occasionally sited on a river next to a grain mill where the grain was ground into feed before it was sent to the elevator for mixing. Other elevator operations ground the feed on the premises.

The name grain "elevator" derives from the way in which the main building functions, involving a vertical process. The feed is initially taken by elevator to an upper story where it is stored in a series of grain bins. It is then dropped through a series of chutes, or "cones" to the main floor below where the mixing process takes place, and the feed is mixed

according to a particular company formula. The mixed feed is subsequently conveyed by elevator up to the mixed feed storage area where it is stored in another series of bins. Some of the feed is shipped in bags while the rest is shipped in bulk and is fed directly from the mixed feed bins into the freight cars by a series of pipes. Grain elevators continue to operate in fundamentally the same way, though the railroad is used mostly for incoming grain shipments, and trucks are used for outgoing feed shipments.

IV. Registration Requirements

I. Name of Property Type Silo

II. Description

The earliest silos were trench or pit silos, square or rectangular in shape, and greater in length than in depth. They were constructed of masonry and were typically located within the main barn to keep the fodder dry and protect it from freezing temperatures. With this early type of silo the fodder was placed in the pit or trench, packed down by foot, then covered with either straw and wood planking, or a heavy layer of dirt or clay, the weight serving to pack the fodder even further. This tight packing method facilitated the fermentation process while cutting off the oxygen supply, and preventing the fodder from decaying. A wood plank roof or overlay was occasionally used for additional protection.

In the 1879-80 Vermont Department of Agriculture Report, General Grout of Barton describes the construction of his 1879-80 silo as follows: "I made an excavation in an elevation of ground and laid in cement split stone, making the interior 15'x40' and walls 15' high. These I plastered with cement and also cemented the bottom so as to make walls and bottom water and air tight. I then put on top (of the chopped corn stalks) 6" of rye straw; upon this I laid 1 1-2" spruce plank and loaded them heavily with stone." (174-5)

By the 1890s farmers began to construct silos above ground, since it was quickly realized that designing a vertical silo, with far greater depth than length, produced an automatic gravitational packing process which lessened some of the labor of stomping on the fodder and covering it with earth. Nonetheless, packing continued to be a standard part of the operation, using either a person or a large animal such as an ox or bull, to do the work. Interior silos were constructed by simply building walls of stone or matched lumber around a section of one of the barn bays. Foundations were either stone or concrete, and the floor consisted simply of packed earth. Finally, two doors were usually built, one at the base and the other opening on to the highdrive or threshing floor, and a small opening was provided near the top where the silage was fed.

While the interior placement of the silo persisted, around the turn of the century it became increasingly common to locate silos outside of, and adjacent to the main barn, occasionally

in pairs, and connected by means of a long narrow chute. In addition, wood replaced stone as the standard construction material. Wood was less costly and far easier to build with, an important consideration in the days when farmers typically built their own silos. The early exterior silos were, like their predecessor, square or rectangular in shape. They were often equal in height to the barn, and contained a concrete foundation and gable roof. Typically, the roof contained a dormer window, sometimes referred to as a trap or silage door, where the fodder was fed into the silo. The interior of the silo was lined with vertical battens to minimize air leakage; nonetheless, the existence of corners allowed for occasional air leakage and the subsequent molding and spoilage of the fodder.

A partial solution to the problem of corner spoilage was developed soon after the development of the upright silo, and the square silo began to give way to a polygonal shape. Polygonal silos were formed of sawn boards stacked like masonry, and were generally either hexagonal or octagonal. The roof shape was typically either conical or hipped conical to accommodate the more cylindrical shape of the polygonal form. Finally, around the turn of the century the round silo was introduced. Though still not absolutely air-tight, this shape eliminated the problem of corner spoilage and it has been the standard form ever since. The early round silo was constructed of relatively thin wood staves, reinforced with a series of metal bands or hoops; the roof was either conical or hipped conical shaped. These wood stave silos continued in popularity until World War II.

During the 1930s, and perhaps as early as the 1920s, concrete was introduced as a construction material for silos. These early concrete silos were concrete stave, which consisted of pre-cast blocks of concrete with a series of metal bands similar to those used on the wood stave. They were smaller in size than the post-War concrete silos, and averaged, like the wood stave, approximately 12' in diameter and 20' high. After the war, the size of silos increased considerably, and concrete silos were constructed with a minimum diameter of 20' and a minimum height of 50'.

In addition to the construction of larger silos, another change in silo construction that occurred after the war developed in response to the introduction of grass silage to Vermont farms. Since grass tended to spoil easily in the wood

silos, farmers experimented with alternative ways of storing this new silage. The earliest experiments reverted back to the original silage method--that of storing the silage underground. However, problems of muddy bottoms and snow cover during the winter led to the building of concrete trenches, or bunker silos, a type that is still in use today. More common was the construction of upright cement and tile silos, which continued in popularity throughout the forties and fifties. Cement silos are still being built today. Metal silos were introduced during the late 1950s and have since been replaced by the blue metal and glass-lined "oxygen limiting" Harvestor silos of today, considered the most air-tight silos to date. The most recent popular development in silage storage is the plastic disposable "Ag-Bag" silo which, due to its relatively low cost and efficient loading capabilities, may replace the more traditional upright silo, which are found throughout the state.

Refuse deposits containing ensilage, architectural debris and discarded implements are often found nearby.

Changes over time:
Some of the early square silos, when replaced by more modern ones, have since been converted to storage use. Some silos have even been converted into residential or office space in recent years.

III. Significance

Survey research so far has not uncovered any of the early trench or pit silos. The early upright square, polygonal and round wood stave silos can still be found on a number of farmsteads in Vermont; however, no early interior masonry silos have been located as yet.

The increasing popularity of the disposable plastic "Ag-Bag" method of ensilage threatens the existence of many of Vermont's upright silos. Due to the considerable expense of the modern Harvestore silos, a less expensive method of storing the silage in plastic bags laid out horizontally on the ground has been developed as an alternative. An additional advantage to this disposable "Ag Bag" method of storage is the fact that it is virtually maintenance-free. The unloaders used in upright silos are a source of considerable maintenance problems as they tend to corrode from the acids in the silage. Once broken, they are difficult and

costly to fix and there is no way of removing the silage to feed the cows. Consequently, some agricultural experts believe that "Ag Bags" will gradually replace the upright silo.

While silos known today have only been around since the late 19th century silos in fact date back to ancient Greece. The word "silo" in French translates literally into "pit" and derives from the Greek word "oipus" which is a pit or hole in the ground specifically built for corn storage. This method later spread to the Romans and up into northern Europe with little modification until the mid-19th century when the modern ensilage system, essentially an airtight system of storage that ferments the corn without letting it spoil, was developed. August Goffart of France was the key figure behind this development and his 1877 treatise on ensilage was in large part responsible for the initial popularity of the silo in the United States.

The first silos in this country were constructed in the 1870s. Most of them were located in the northeastern section of the country where dairying had begun to develop on a commercial scale and where farmers were giving increased attention to improving the quality of feed for their dairy stock. At first farmers were suspicious of ensilage, and often the intitial capital cost was such that only well-to-do farmers could afford to build them. It was gradually accepted, however, that the nutrients retained in the fermentation process resulted in more milk per cow at a higher quality than had been the case when hay and pasture grass provided the mainstay of the diet.

The Vermont Department of Agriculture Report of 1879-80 mentions the first silos in Vermont were built that year. There were reportedly four of them, two located in Barton, one in Essex and one in Randolph. By 1900, silos had become fairly widespread in Vermont and they continued to grow in popularity as their design was improved upon during subsequent decades.

IV. Registration Requirements

I. Name of Property Type Milkhouse

II. Description

According to Byron Halsted's 1881 book Barns, Sheds and Outbuildings, the 19th century milkhouse or dairy was a single-story, gable-roof structure constructed of wood or masonry with a stone foundation and located either over a spring or well, or adjacent to an icehouse. It contained one or more windows for light and a single entrance. The dairy might contain two rooms, a milk room and a butter or churning room. The milk room featured a stone setting trench, or cooling tank, at the base of one or more walls where the milk pans were placed in a stream of cool running water. Once the milk had set, the cream was brought into the churning room where it was made into butter. In addition, the dairy might contain a cellar for storing wheels of cheese and tubs of butter. Typically, however, the setting and churning took place in one room, and butter and cheese were stored in wooden containers in the farmhouse cellar or separate stone cellar or outbuilding.

According to a 1916 Vermont Department of Agriculture Bulletin, the milkhouse type that became widespread in the 1920s is also a small one-room, single-story, wood-frame or, rarely, masonry building with a concrete foundation and is either attached to or near the main barn. For the sake of convenience the milkhouse is usually attached to the main barn, and typically separated from the stable area by a narrow hallway and a door to prevent the stable odors from contaminating the milk. It is generally located on the side of the barn closest to the main road or driveway for easy loading on to milk wagons and, later, trucks. To further facilitate loading, some milkhouses contain a raised entrance, the base of which is located in accordance with the average wagon height. If possible, the milkhouse is constructed on or near some kind of water source. It is also best if it is located on the north side where it is subject to the least amount of sun exposure. The roof shape is either shed, gable or gambrel and may mimic that of the main barn. There is at least one and often more windows to allow for sufficient light and ventilation, and a ventilator is sometimes located at the central roof ridge for additional air circulation. Some milkhouses feature chimneys, indicating that stoves were used to keep the temperature inside the milkhouse at sufficiently warm levels during the winter months. Other interior features

typically include either a water tub, or a concrete cooling tank located along the base of one of the walls, and concrete flooring which typically slopes down at a slight angle towards the center of the room for drainage, and finally a sink for washing the milk handling utensils.

Milkhouses can be found throughout the state and are often near or attached to dairy barns.

Refuse deposits containing agricultural trash, discarded implements and architectural debris may be found nearby.

Changes over time:
By the 1940s, most water tubs and trenches had been replaced with mechanical electric coolers, holding 4 to 8 cans. By 1960, bulk tanks were installed on most dairy farms, in some cases resulting in the replacement of the smaller, earlier milkhouses with new, larger ones.

III. Significance

Pre-1941 milkhouses designed in compliance with sanitation requirements for handling milk continue to be used to this day. However, changes in milk handling over the years, such as mechanical electric coolers which were introduced in the 1940s, and even more importantly, the bulk tank which was introduced during the 1950s, prompted many farmers to replace the old milkhouses with larger, modern structures.

Throughout most of the 19th century, dairy processing operations typically took place in the farmhouse in a separate room known as the "buttery." This was a cool, dim pantry containing walls lined with racks or shelves where the fresh milk, once it was strained, was placed in shallow pans to set. Once the cream had risen to the top, it was skimmed off and poured into a wooden churn and made into butter. (See the dairy section in the Agricultural Processing context)

During the 1880s, as dairying began to grow increasingly specialized and improved methods of handling milk and milk products were developed, the Danish method of deep setting was introduced. With the deep setting method, instead of placing the milk pans on racks, they were set in tanks of cool, preferably running, water to insure a faster cooling and setting period. In order to facilitate this method some farmers began to build separate structures known as "dairy" or

"milk" houses which were often located over a cold spring or attached to an icehouse (see "Icehouse" section of Property Types). Many farmers simply used their wells for such purposes. Others used a separate room in the farmhouse known as the "milk room" containing double hollow walls for insulation. Still other farmers built milk rooms inside the actual dairy barn; however, this was deemed less than satisfactory as the odors from the stable often contaminated the milk.

In the early 20th century, health officials and milk handlers from states receiving Vermont milk became increasingly concerned over problems in the handling of milk on the farm. Farmers were encouraged to construct separate milkhouses designed in accordance with minimal sanitation requirements (see Vermont Department of Agriculture Bulletin no.27, July 1916). With the growth of the fluid milk industry during the 1920s milk houses became mandatory for most milk producers. Consequently, throughout the next twenty years nearly every dairy barn in the state had one of these modest yet essential little additions built on to it.

IV. Registration Requirements

I. Name of Property Type Ice House

II. Description

Icehouses are typically single-story, one-room, gable-roof buildings. They generally feature stone or concrete foundations; however, some icehouses, such as those found in summer camp areas, simply rest on wood or concrete piers. While stone icehouses were occasionally built, wood was the standard material as it does not conduct heat. If stone was used, it was recommended that a coat of whitewash be applied to the exterior to reflect the light. If possible, ice houses were built on a slight slope to facilitate drainage from any melting that occurred. To allow for proper drainage some icehouses were built with rough cobble flooring, or, in the case of a more solid type of floor, piping was sometimes installed at the center. Occasionally double walls might be used with a space in between which was either left hollow if sufficient insulating materials were used, or it was filled with sawdust or some other non-conducting material. Openings typically include a single entrance at ground level, an opening under one or both gable peaks to facilitate storing the top layers of ice or to provide additional ventilation, and finally a small ventilator at the center of the roof ridge. An additional feature might be the use of overhanging eaves to help shade the walls from sunlight.

Refuse deposits are expected to be minimal but may contain discarded implements and architectural debris.

Icehouses are found throughout the state and are not just located on farmsteads. In addition to the commercial icehouses located in large towns, small town storekeepers occasionally had icehouses and sold ice to local residents or summer people.

Variations:
Icehouses might simply consist of a room in the main barn (often built into the corner of a hay bay) with double hollow walls for insulation. Some icehouses consist of four walls with no roof.

Icehouses found in the summer camp area of Greensboro do not have foundations but are instead, in keeping with the construction of the camps themselves, supported by wood or concrete piers. They do not have ventilators, and simply

contain a door, and possibly a small louvered or glazed opening under the gable peak.

Underground icehouses, which were less popular than upright icehouses, generally consist of a large pit lined with stones and mortar with a gable roof overhead to keep off the snow and rain, and possibly a ventilator. The ice was packed in the same manner as the upright.

Masonry structures built into hillsides (most likely the north face) to take advantage of the natural soil insulation may have functioned as icehouses.

Combination ice and dairy houses generally consist of a wood frame icehouse as described above, with an attached dairy or "cooling room" which is either of masonry or wood-frame construction. Occasionally the ice storage area was located above while the cooling room was located in a half basement beneath. Another alternative is to place the ice storage both above and around two or three sides of the dairy to allow for maximum cooling.

Changes over time:
It appears that those icehouses that do exist have typically been converted for storage. In summer camp areas, icehouses seem to have been frequently converted to boathouses.

Icehouses built in a corner of a hay bay reverted to hay storage or silage with the advent of electric milk coolers.

III. Significance

During the first half of the 20th century many Vermont farms had an icehouse, although some farms simply had ice cold spring water piped in to the barn or main house. By World War II, the electric refrigerator had obviated the need for icehouses on most Vermont farms; consequently, most icehouses today exist only as archeological sites. The one location where they appear to be fairly prevalent, despite the fact that they no longer perform their original function, is in summer camp communities. Many of the summer communities developed in remote, rural areas where electrification came relatively late. One reason why many farms no longer have their old icehouses, and the summer communities do, is that where the old icehouse might have been torn down on the farmstead to make way for a new building, very often the

icehouses belonging to summer communities were simply readapted for use as a boathouse, sleeping cottage or other function.

Throughout the first half of the 19th century ice was considered a luxury. Ice houses were rare and variously designed, ranging from underground pits to upright wood or masonry structures. Wood was the preferred construction material and straw was generally used as a packing and insulating device. For those who could not afford to build separate structures, a section of the house, the cellar or a shed was used instead.

Around the mid-1800s, the icehouse began to be used for refrigeration purposes, and new methods of construction and storage were devised and improved upon during subsequent decades. With the coming of the railroad to Vermont in the 1850s, commercial ice houses were built along railway lines for storage and transport needs. These commercial icehouses, which specialized in storing ice, influenced the designs and storage methods of the smaller community and private family icehouses. In addition, agricultural periodicals of the time published articles on the various types of ice storage, both pit and upright, and featured basic functional types as well as those of a more elaborate design with the detailing, and sometimes even the overall massing, of the popular architectural styles of the day.

By the late 19th century, as dairying developed into Vermont's leading agricultural activity and various milk-cooling devices were developed, ice began to be used increasingly on Vermont farms. By this time icehouses had become fairly systematic in their designs and some farms began to integrate their icehouses with the dairy or "cooling room." Those icehouses not integrated were instead located either near the kitchen or buttery, or near the milkhouse. Still, the use of ice houses on Vermont farms was relatively rare until the advent of the fluid milk industry in the 20th century when ice became an almost essential device for cooling and storing milk on the farm. (see Milkhouse section of Property Types).

Ice was "harvested" in January or February, the coldest months of the year, during which time frozen ponds, lakes and rivers were visited by ice cutters with a wagon or sled. The ice was typically sawn into standard-size, square blocks to allow for neat, tight packing in the icehouse. Once the ice was brought

to the icehouse a layer of sawdust (straw, or other non-conductive materials were also used) was placed on the floor whereupon the ice was stacked, preferably with water poured between the cracks to eliminate air pockets. The sawdust was placed between each layer, and packed 8"-12" deep on the sides and 24" on top so that the entire surface was completely insulated. Typically, additional space was left between the top layer of sawdust and the roof rafters where some kind of ventilation device was located to allow for any warm air that was generated to rise and escape. IV.

IV. Registration Requirements

I. **Name of Property Type** Pump/Well House

II. **Description**

A pump/well house is simply a small wood or masonry gable roof structure and typically features either a concrete or stone foundation. It varies in size, although it is usually just large enough to cover the pumping mechanism as its primary function is to serve as a protection device. The pump is located over a stone, concrete or brick lined well containing water that is piped in from a nearby water source. The historic piping is either constructed of fir logs with holes bored into them, or of lead. While most pump houses are very simple, functional structures occasionally one can find elaborate structures embellished with almost the same degree of detail as the main dwelling. Such pump/well houses are usually associated with farms belonging to wealthy gentlemen farmers/landowners.

III. **Significance**

It is not known how extensive pump/well houses were in Vermont during the 19th and early 20th centuries; however, with the advent of electrical plumbing pump houses were no longer needed as their sole function was to house the pumping mechanism, hence there are relatively few remaining.

On the farm, along with their use as a water source, well and pump houses were also sometimes used instead of milkhouses for the purpose of cooling and storing milk and cream.

IV. **Registration Requirements**

I. Name of Property Type: Spring House

II. Description

Springhouses are small, wood frame structures with stone or concrete foundations, located over a spring, and are usually just large enough to surround the circumference of the spring opening. The spring water is generally contained in a stone or cement cistern. Springhouses can vary from a simple gable or shed roofed structure, to an elaborate polygonal building with lattice walls and a slate roof capped with a finial. Where possible, springhouses are located on a knoll or some other raised point in the landscape to ease the gravity flow of water through wood or lead piping to the farm house and barns. Water piping, however, was not extensively used until after the Civil War when lead piping was commercially available. Springhouses can be found throughout the state.

Variations:
Many springs were (and still are) accessed by a simple spring box consisting of a stone or concrete lined cistern fed by a spring, with a pipe leading, usually downhill, to the dwelling and/or barn.

Byron Halsted's Barns, Sheds and Outbuildings (1881) describes springhouses as containing a trough and not a cistern. This type of design has so far not been found in any survey research of Vermont springhouses.

III. Significance

It is not known how extensively spring houses were used on Vermont farms and residences during the 19th century. With the advent of electrical plumbing the use of springhouses was often discontinued, though some were maintained for emergency purposes. Research indicates that they are relatively rare.

Spring houses were sometimes used as a decorative and protective device to cover a cistern. Like pump/well houses, prior to the development of electrical cooling devices, they were often used to keep milk and cream cool during the warm months.

IV. Registration Requirements

I. Name of Property Type Cheese Factory

II. Description

The cheese factory is typically a two- or three-story, gable-roof structure of wood-frame or masonry construction resting on a stone foundation. It is often located on a water source for power. To allow for easy access to the basement where the cheese is aged and packed in boxes for shipment, cheese factories are frequently built into a hill with the basement exposed towards the rear gable end. Like many commercial structures of the 19th century, the cheese factory is likely to feature a vertical succession of loading doorways at each story on the front gable end. Where this is the case, a hoisting boom projects from the gable peak above for loading purposes. The main entrance might be elevated with a loading dock at its base to facilitate the transferral of fresh milk from the wagon to the factory. Fenestration, typically double-hung sash, is evenly distributed throughout the building to provide ample light. A chimney is another standard feature, indicating the heat source used to warm the milk. By the late 19th century coal-fired boilers were used.

Inside, the main or first floor is typically used for processing. Divided into two large rooms, one consists of the "make room" or vat room where the actual production of cheese occurs, and the other is the drying, or curing room where fresh wheels of cheese are placed on open racks to dry for about one week. In addition, there must be space for the equipment used for waxing and dry wheels.

The basement is typically where the cheeses are left to age, and it can also be used for cold storage. There is often a large door at this story where the wagon was brought to load up a shipment of cheese. Cheese was shipped and stored in special cheese boxes which were made at the local cheese factory.

The upper floor is used for general storage, and later, when mechanical refrigeration came into use, it might have been converted to use as cheese storage as well.

Typical equipment in cheese factories included large vats, sinks and presses. Refuse deposits containing agricultural trash, discarded implements, equipment and architectural

debris may be nearby.

Cheese factories were built throughout the state of Vermont.

Variations:
Some cheese factories simply looked like houses on the exterior. In this case, if built into a bank, the basement level typically features a large, double-width, sliding door where the wagon was brought to pick up the cheese.

Changes over time:
Many of the former cheese factories have either been removed or converted to another use, dairy-related, or other.

III. Significance

Cheese factories were a common building type in Vermont in the late 19th century, especially in the southern half of the state. When commercial cheesemaking was superseded by the rise of commercial butter production in the 1890s, many of Vermont's cheese factories went out of business and the buildings were either converted to creameries or other uses, or were removed altogether.

The factory system of cheese making in Vermont developed in response to the growing commercialization of dairying during the second half of the 19th century. Prior to 1864 when the first cheese factory in Vermont was built, cheese processing was entirely a domestic operation. The growing market for Vermont cheese in southern New England and New York, and the concomitant need for more standardized products and more efficient methods of production, led to the establishment of the factory system of cheesemaking, previously begun in New York State in the 1850s. While peak cheese production occurred as early as 1869, when cheesemaking was still predominantly a home operation, it was not until the 1870s that the factory system began to flourish in Vermont. By the 1880s cheese factories could be found in towns throughout the state, particularly in the southern half of the state.

In addition to responding to market demand, cheese factories also provided an essential community service of converting the local surplus of fresh milk into a valuable commodity. Operating season for cheese factories was generally June to the end of September. This period coincided with the large increase in production, as well as the most difficult time to

store milk prior to the introduction of mechanical cooling devices. Patrons sold their milk to the factory, and also received whey to use for animal feed.

While cheese factories continued to flourish during the latter decades of the 19th century, improved refrigeration methods, coupled with the growing demand for butter, and later fluid milk, in the sprawling urban areas of southeastern New England and New York led to a gradual decline in factory production in Vermont. During this time many of the cheese factories were either removed, or converted to other uses, often dairy-related, such as creameries or milk-processing plants.

IV. Registration Requirements

I. Name of Property Type Creamery/Butter Factory

II. Description

Creameries are usually built into a bank, in which case a large double door is located at the basement level for the transfer of butter on to the wagon. Windows are located throughout the building to provide an ample light source, and there may be a chimney crowning the roof ridge as well. Pre-1940 creameries required some source of water, but had minimal power needs. Some creameries may have large brick-lined or stone-lined vats built below ground, possibly serving as storage for buttermilk.

Refuse deposits containing agricultural trash, discarded implements and equipment, and architectural debris may be nearby.

After the turn of the century, creameries could be found in most towns in Vermont; however, most of the creameries in Vermont were located in the northern 2/3 of the state.

Variations:
Occasionally creameries were located on somebody's farm. In this case the "creamery" was simply a room attached to the house, or it was a separate building altogether.

Some of the larger, 20th century creameries were substantial industrial structures.

Changes over time:
Creameries were sometimes converted to milk plants, and less frequently, cheese factories or residences.

III. Significance

Around the turn of the century, creameries, otherwise known as butter factories, were a common building type in Vermont. When dairying in Vermont shifted from butter production to fluid milk, creameries were either converted to new uses or removed. Consequently, those few that remain have likely undergone significant alterations to accommodate new functions.

The factory system of butter making in Vermont developed in response to the growing commercialization of dairying during

the latter decades of the 19th century. Like cheese, butter was initially a domestic operation, typically delegated to the female members of the household. Beginning in the 1880s, as the market demand for butter increased in the expanding urban areas of southern New England and New York, cooperative creameries were established to serve the local dairy farmers. Where formerly farmers had used cheese factories as a repository for their surplus cream, as butter brought higher returns they began to bring their cream, where possible, to creameries. During the last two decades of the 19th century, in addition to increased demand and improvements in refrigerated transport, the advancements in processing methods such as the introduction of the cream separator, the power churn and the Babcock Tester, were significant factors in the development of the factory system of butter production in Vermont. Some towns and villages had as many as three creameries in operation at one time, i.e. East Berkshire, Franklin County. In this case, butter production tended to dominate the economic life of the town until World War I when dairy production shifted to fluid milk.

The early creameries were generally built into a bank so that the top floor could serve as the receiving floor and the lower stories contained the processing operations and storage. When farmers brought their cans of cream to the creamery they were brought directly to the receiving room. Here, the milk was weighed on a large scale, after which the cream was thoroughly mixed and a sample taken and placed in a numbered bottle. The sample was tested with the Babcock Tester once a month for butterfat content, the percentage of which determined how much each farmer was paid.

Next, the cream was poured into a large vat which was typically located in the story directly below the receiving room. The temperature of the cream was kept at an appropriate level by means of a coil which contained ice water in the summer, and was heated in winter to turn the ice water to steam. The vat had a compartment in back for this purpose.

When the time came to churn the cream into butter, the cream in the vat traveled down a pipe, through the floor, to a large wooden power churn located in the next, lowest story. After the cream was made into butter it was placed on a butter table where it was stamped and wrapped for the local market, or placed into large wooden tubs to be shipped out by rail.

IV. Registration Requirements

I. Name of Property Type Skimming Station

II. Description

It is likely that skimming stations were located throughout the entire state at one time. They are most likely to be found off the beaten track, i.e. in smaller towns or villages not located on or near a railroad.

III. Significance

Skimming stations accompanied the rise of creameries during the late 19th century. Where creameries were typically located in towns and larger villages located on or near the railroad, skimming stations were built in the more remote villages so that farmers would not have to haul their milk over long distances. Skimming stations were thus associated with a creamery in a neighboring town.

IV. Registration Requirements

I. Name of Property Type Milk Plant

II. Description

Milk plants are typically single-story, wood-frame or masonry buildings with concrete, stone or brick foundations. Windows often feature large industrial multi-pane sash, and a tall smokestack is located adjacent to the main building. At the very least, the interior might contain two large rooms: a receiving and weighing room, and a vat room where the milk is pasteurized. There might also be a refrigerated storage room, and a bottling room for the milk not shipped out by rail. Also, equipment for washing and steaming the milk cans is expected.

Refuse deposits containing agricultural trash, discarded implements or equipment, and architectural trash may be nearby.

The earliest plants were probably built in southern Vermont, and, until the beginning of truck transport to milk plants elsewhere in the state, were built along rail lines for convenience in transport and loading. Occasionally, milk plants were built on individual farms.

Variations:
Milk plants are occasionally two stories, depending on the size of the operation.

Changes over time:
In the case of plant expansion, the addition of wings is likely. The most significant alterations, however, tend to occur on the interior as the plant is altered to accommodate new, more modern equipment over the years.

III. Significance

Around World War I, in response to the growing demand for milk in urban markets both in and out of state, Vermont dairy farmers began to shift from butter production to that of fluid milk. As had been the case with early cheese and butter production, the first areas in Vermont to make the transition to fluid milk were located in southern Vermont due to their proximity to the major urban markets to the south. The invention of the refrigerated railroad car in 1904 made long range transport of milk possible, and milk production spread

quickly north along the major rail lines. While former creameries were sometimes converted to milk plants, special buildings were also constructed during the early years. Milk plants were typically built adjacent to the railroad tracks so that the milk could be fed from the plant directly into a refrigerated car. In the 1920s, as truck transport began to replace the railway, milk plants were built in those more remote regions not located near the railroad, and dairy farmers in such regions were consequently able to shift their operations to fluid milk production.

As milk plants did not require the processing equipment of cheese factories or creameries, they tended to be somewhat simpler, single-story buildings. When the milk was brought to the plant it was typically placed on a conveyor which carried the cans inside the plant where the milk was weighed and sampled. The milk was then poured into a vat whereupon it traveled through a large pipe which contained smaller pipes filled with cool water. From the piping it was fed into a refrigerated train car.

IV. Registration Requirements

I. Name of Property Type Slaughterhouse

II. Description

Although they are occasionally found on farmsteads, slaughterhouses are often located at some distance from any human habitation due to problems of flies and smell. They are typically located on streams for drainage.

The slaughterhouse is typically a gable-roof, wood-frame structure with a stone foundation. It is generally built into a bank with an opening in the foundation to allow for drainage of the blood and offal. Openings include a single entrance and possibly one or more windows for light and ventilation. Slaughterhouses might also feature a ventilator/cupola on the roof ridge for additional ventilation.

Slaughterhouses required a source of water but did not have significant power requirements. Refuse deposits containing agricultural trash, discarded implements and equipment, and skeletal waste may be nearby.

III. Significance

It is unknown how common slaughterhouses were during the 19th century, though it is probable that most farmers did not go to the extra expense of constructing a separate building, but instead simply slaughtered their livestock in the barnyard.

Slaughterhouses are believed to be closely related to the tannery industry. Tanneries and slaughterhouses may sometimes be found in proximity to one another.

The slaughterhouse is indicative of a time when farm families were largely self-sufficient and the majority of the family's foodstuffs were provided from the farm. The growth of the western beef economy and meat-packing industry, alongside the development of improved transport facilities, made commercial meats more readily available to Vermonters during the closing years of the 19th century, which may have brought a gradual decline in the degree of localized slaughter. Slaughterhouses provided tanneries with a constant supply of hides.

Slaughterhouses were also used for commercial purposes wherein a farmer operated his own meat delivery wagon for local customers. When travel became more convenient, and

refrigeration more widely used, such operations went out of business.

IV. Registration Requirements

I. Name of Property Type Tannery

II. Description

A constant and ample water supply is essential to the tanning process. In addition to using water for soaking hides, it was also the most common means of powering tannery mills in Vermont. The earliest mills used animal power, followed by water power, until "by the 1850s all three of these power sources were used in Vermont with a strong preference for water power." (Thomas and Warren) Of a total of 120 Vermont tanneries listed in the 1850 census, 93 were powered by water wheels and 11 by steam.

The type of building used to house the tanning process varied from a simple open shed to a fully enclosed workspace. Characteristic features of a tannery site include a tall, stone foundation (partly to provide sturdy support for the building, and partly to protect the tannery from rot and flooding due to its necessary proximity to water), a tanner's half-rounded beam, sunken and above-ground wood-lined vats for the soaking process, a dam, head race, tail race, penstock, and bark processing mills.

There may be additional sheds/buildings for different steps in the tanning process such as drying and finishing. Workers' housing may be associated with some tanneries.

Refuse deposits including bark spuds, axes, tanners' and curriers' beams, fleshing and dehairing knives, curriers' knives, bits of hide, hair, bark, lime and other waste deposits and architectural debris may be nearby.

Tanneries were once ubiquitous in Vermont and New England. Due to the need for water in the tanning process (for power and soaking) they are located on or near a water source. They may or may not be associated with a slaughterhouse. Some tanneries did the slaughtering on the premises. Since 1860 their numbers have steadily declined. Today they are a rare property type and exist mostly as archeological sites.

Changes over time:
Subsequent to the decline of local tanning after 1860, most tanneries were either converted to other uses, or were left to deteriorate, burned or destroyed. Many may have been washed away in freshets and floods due to their proximity to rivers

and streams.

III. Significance

Tanneries were relatively common in 19th century Vermont. A census of 1810 lists over 200 tanneries in Vermont. By 1850 the number recorded had decreased to 120, and by 1870 only 86 remained. This decline largely stemmed from: the availability of cheaper imports; the depletion of raw materials (hides, bark, lime); the centralization of the leather-manufacturing industry, and better transportation in southern New England; and greater specialization and technological sophistication of machinery required. Vermont's tanneries were gradually abandoned, destroyed or converted to other uses. Most tanneries today exist as archeological sites.

Tanneries were, alongside grist mills and saw mills, among the earliest, and most common industries in Vermont in the late 18th and early 19th centuries. Due to the superior quality of factory-tanned products, the tanning process was commercialized and removed from the household level early in this period.

Prior to the 1830s, tanneries produced for a local market, and the tanner and shoemaker were often the same person. During the 1830s, increased regional trade between Vermont and other northeastern states following the opening of the Champlain Canal in 1825 stimulated the growth of exports to out of state markets.

Tanning requires three basic raw materials: bark, lime and hides. The first step in the tanning process is that of soaking the hide in water or a chemical solution (lime and water) to allow for the removal of hair. The hides were then soaked in a second solution to soften them and facilitate hair removal. Once the hides were soft enough they were placed on a half-round "tanner's beam" and the hairs were scraped off with a special dehairing knife. After all the hair was removed the hides were then soaked in a large vat filled with a tanning solution to prevent the hides from rotting. This solution was made by grinding up bark (usually hemlock or oak) through a bark mill, then soaking it in water to extract the tannic acid. "This solution was then used to induce a chemical reaction that combined the gelatinous underlayer of the skin with the skin itself, forming a waterproof bond."

(Thomas and Warren) The length of the process varied according to the types of hides being tanned.

IV. Registration Requirements

I. Name of Property Type Potato Warehouse

II. Description

The early potato warehouse located along a railroad is typically an eaves-front, rectangular, wood-frame building with a gable roof, concrete foundations, and clapboard siding. Large elevated entrances with loading docks, or platforms, are located at the eaves front facing the railroad tracks. Loading docks may occur at the gable or rear eaves sides. Ventilators and chimneys are located on the roof ridge, which indicate the means with which such buildings were maintained at an even temperature to protect the potatoes from frost and rot.

Refuse deposits containing agricultural trash, architectural debris and discarded implements may be nearby.

The earliest warehouses were located at railroad depots. After the 1920s they could also be found on individual farms. Orleans and Caledonia, and to a lesser extent Franklin and Windsor, counties were the leading potato growing regions in Vermont, and consequently are the most likely places where such warehouses would be located.

Variations:
In the case where a potato grower built his own warehouse, the building might either consist of a converted livestock barn, or it might be a new structure containing most of the above characteristics, yet most likely containing only one loading dock.

III. Significance

Potato warehousing began around the 1920s in response to consumers' demands for better packing and storing prior to shipment. These warehouses were mostly built on railroads running along the eastern part of the state in towns such as Greensboro Bend, Hardwick, Morrisville, Bradford and Bellows Falls. With the increased use of truck transport in the 1930s, some potato growers began to store their harvests in private warehouses on the farm.

IV. Registration Requirements

I. **Name of Property Type** Maple Sugar House

II. **Description**

Sugar houses are either located in the actual sugar bush, or within the main complex of farm buildings. They are typically single or 1.5-story, gable-roof structures with stone foundations and eaves-front entrances. The roof is generally sheet metal and is crowned with an elongated wood ventilator. The interior may simply consist of a single room where the evaporator and other pieces of processing equipment are kept, along with an ample supply of firewood. Occasionally there is additional storage space located at the 1.5 story, and a woodshed is often attached to one side of the building.

According to Everett Willard at the Vermont Department of Agriculture, a "sugar bush" has no strict definition in terms of numbers of trees. Any number of maple trees, whether two or two thousand, is considered a sugar bush. The size of the average sugar bush in Vermont is approximately 1,000 maple trees, though the number has recently been increasing.

Refuse deposits may contain discarded implements and equipment.

Maple sugar houses are found throughout the state. Orleans, Franklin, Lamoille, Caledonia and Washington counties are likely to have a greater number of sugar houses as they have have been the leading maple sugar and syrup producers in the state for nearly a century.

Changes over time:
According to Everett Willard, maple sugar houses have changed little since the turn of the century. Some of the modern evaporators have steam hoods over them, which obviates the need for a ventilator on the roof crest.

Where the earlier sugar houses were constructed in or near the actual sugar bush, technological developments such as the introduction, and rapid adoption of, plastic tubing systems for sap collecting in the last 25 years have allowed the sugar house to be placed in a more convenient location. Both the use of plastic tubing, and the use of oil fuel in evaporators have greatly reduced labor costs which made larger operations feasible. In the case where larger operations were developed, larger sugar houses might be constructed.

III. Significance

Maple sugaring has been a springtime activity in Vermont since the 18th century, and Vermont's Native American people most likely sugared for centuries before then. Today Vermont produces more maple sugar products than any other state in the country. The prevalence of small sugar houses around the state, whether tucked away in the shade of a maple wood, or set in an open field just beyond a cluster of barns and outbuildings, attests to the continued popularity of maple sugaring in Vermont.

Maple sugar production predominated in the 18th and 19th centuries. After 1890, as cane sugar became increasingly plentiful, the demand for maple sugar declined, and maple syrup was processed in greater quantities.

Initially, the processing operation took place outside where the sap was boiled down in a large kettle suspended over an open fire. Gradually this process was moved into the confines of a small shed. Processing methods were significantly improved upon after 1860 as various kinds of evaporators were introduced. It was during this time that special buildings were constructed to house the equipment and provide protection from the volatile weather of early spring. While the processing equipment has grown more sophisticated over the years, the sugar houses themselves have changed little in their basic design and use.

IV. Registration Requirements

I. Name of Property Type Maple Sugar Factory

II. Description

Maple sugar factories are typically masonry buildings of two or more stories with concrete foundations, a flat roof and industrial sash windows. Equipment includes storage vats evaporators, canning and packaging facilities.

Refuse deposits containing agricultural trash, architectural debris, and discarded implements and equipment may be nearby.

Maple sugar factories are most likely to be located in the northern part of the state, usually on a railroad track.

III. Significance

There are four known pre-1940 sugar factories in Vermont, located in Essex Jct., Newport, Jacksonville and St. Johnsbury. In addition, there is a former maple sugar factory in Burlington.

Vermont has always been an important maple producing state. During the latter half of the 19th century, improved methods of processing paved the way for the factory system of maple sugar production beginning around 1909 when the first known maple sugar factory was built in Newfane, Vermont. Maple sugar factories were established at this time in order to facilitate the mass-production and marketing of maple goods.

IV. Registration Requirements

I. Name of Property Type Grange

II. Description

Granges are typically simple, 2-story buildings located in the center of a town or village. Their civic function is suggested by their relatively large size, and double-door entrances. Otherwise, they are generally straightforward gable-front, wood-frame buildings with stone or concrete foundations, simple entry porches, and a large open room inside for meetings, dances, suppers and other social gatherings. Granges built in the 20th century may have kitchens and indoor plumbing facilities as part of the original design.

Granges can be found throughout the state.

Variations:
Some granges were built to serve a dual function, such as the Bridgewater Corners Grange Hall, which was home to a cheese factory as well during the early years. Some granges feature unusual roof types.

Changes over time:
During the 20th century, many granges have added kitchens and indoor plumbing.

Just as many grange halls formerly served a different civic function, they were occasionally converted for other public functions, whether churches, town halls or schools.

III. Significance

The Grange in Vermont developed not only as an offshoot of the national Grange movement, but it also stemmed, in part, from a tradition of agricultural organization dating back to the early 19th century when Vermont's first agricultural societies were organized. Like its predecessors, the Grange served an important social and educational function on the state and particularly the local levels. It also served a brief political function, especially during the late 1880s and 1890s. Four years after its founding in 1870, the number of subordinate granges in Vermont had risen to 160 with approximately 6,300 members. Although membership grew quickly during the early years, the Vermont Grange was maintained on somewhat shaky ground, and after 1875 it experienced a period

of decline when a number of granges were discontinued. Beginning in the late 1880s, however, the Grange was revived and developed into a significant social and, briefly, political organization for Vermont's agricultural community. In 1911 the Grange reached its highest level of membership at 20,000, and although it experienced a second decline after the first World War, it was once again revived and in 1945 constituted the largest agricultural organization in the State.

The first Grange hall built in Vermont was constructed in 1876 in Bridgewater Corners, Windsor County. It was built as a combination Grange hall/cheese factory, and it continues to be used as a Grange hall to this day. However, the building of Grange halls appears to have been relatively rare. More often, the local Granges might purchase a building, or borrow the local town hall, the church vestry, or some other public building for their meetings and various other social gatherings. As Grange membership grew during the the late 19th century, local granges began to acquire existing public buildings such as town halls, churches, schools or stores whereupon they might alter the interiors as necessary.

IV. Registration Requirements

I. Name of Property Type Fairgrounds

II. Description

Typical fairground components include a perimeter fence, a grandstand, bleachers, a racetrack, a show ring, barns where livestock are housed, and a series of exhibition halls where everything from machinery exhibits to floral shows took place.

Refuse deposits containing a limited range of domestic and agricultural trash, discarded tools and architectural debris may be nearby.

Fairgrounds are usually located outside the center of town as a significant amount of space is necessary to house the fair. Rutland is the only known fairgrounds that is currently located in an urban setting.

Changes over time:
Changes mostly include the construction of new buildings (often replacing the old) to accommodate expanding fair programs, and changing exhibitions.

III. Significance

Since many fairs moved to a different location each year, there are very few fairgrounds in Vermont that contain permanent structures pre-dating 1940. The only such fairgrounds known today are the Orleans County fairground in Barton, the Caledonia County Fairground in Lyndonville, the Champlain Valley Exposition in Essex Junction, the Rutland State Fairground in Rutland, the Tunbridge World's Fair in Tunbridge, and the Deerfield Valley Farmer's Day fairgrounds in Wilmington.

Fairs have played an important role in the history of Vermont agriculture since the 1840s. Awarding prizes and presenting agricultural programs at the fairs encouraged the development and adoption throughout Vermont of crop and animal hybrids and of innovations in farm processing and technology. As an annual celebration of agricultural life, the fair has continuously served an important social function by offering a measure of accomplishment for farmers, reinforcing their shared traditions and values, and educating others about agriculture. Although the early fairs were primarily devoted to agriculture, as the 19th century progressed they

increasingly began to serve as an important focus of popular entertainment, featuring horse and harness racing, music, dancing, oratory, drama, and carnival games and rides, among other sports and amusements.

In addition to the state and county fairs, local and regional fairs were also held, so there were probably several fairs in each county over the course of the summer and fall.

IV. Registration Requirements

I. Name of Property Type Fencing

II. Description

There are various types of fencing that have been used on Vermont farms since the early days of settlement. One of the earliest was the stump fence. After clearing the land, fields were dotted with stumps which had to be removed in order to make the ground workable. Consequently, the stumps were often moved to the perimeter of the field and lined up in such a way as to create a tight fence. These fences were remarkable for their general bulk, and the tangled silhouette the roots made against the sky.

Another early fence type is the pole fence. This type of fence is made by driving a set of stakes into the ground in such a way that they form a pair of X's at intervals of about 12'. Rails are then placed between each set of stakes, their ends resting in the crook of the X's. A variant on this type of fence is the stake and rider fence, which is essentially the same except that the rails are placed so that one end is on the X while the other is on the ground, which makes the fence higher and more difficult to get through.

The zig-zag fence is also an early fence type. This is made by simply laying split rails on top of one another in such a way that they create a zig-zag pattern. The bottom rails are often placed on a pair of stones to keep the ground moisture from seeping into the wood. Each joint is held together with two stakes driven into the ground, one on each side of the fence, and secured with wire.

Post and rail fences were relatively common, although they were particularly difficult to construct. The posts consist of split logs which are driven into the ground where they receive the rails in a series of elongated holes where the tapered rail ends are placed.

The stone wall is, by nature of its durable material, the most prevalent type of late-18th and 19th century fencing still found today. Like the early stump fence, early stone fencing was largely a consequence of land clearance. Vermont's stony terrain required the clearing of stones from a field prior to its use for crop raising. The Vermont Farm Year in 1890 describes how, "rather then leave the stone heaped up in piles scattered over the fields, it was painstakingly loaded onto

stone boats, hauled to the edges of a field by an ox team, and made into stone walls." (64) As frost action brings stones to the surface, removing stones to the edge of a field to prepare for plowing was often an annual chore. "Stone for walls were associated with the plowing of cultivated fields each year, but not normally with the unplowed pastures and woodlands." (Dorney, p.43) Because of this annual rock "crop", stone walls were typically built over a number of years. The presence of stone piles on a former farmstead may indicate that stone ceased to be used, or needed for fencing. (Dorney, p.43)

There are two kinds of stone walls: double and single walls, both of which are equally strong. Prior to building the wall, the line of the wall was laid out, then it was dug "down to the hardpan." The walls are constructed with broken joints to make them secure, and they are typically built 20" or more in height. In the case of double walls smaller stones are placed in between the two rows to allow for water fallout and prevent the moisture from freezing on the inside. In addition, "through stones", which are stones running the full thickness of the wall, are laid every 3' as a means of tying the wall together. The field shape delineated by stone walls is usually rectangular, and in the case of field line walls, they do not necessarily enclose fields on all four sides; a wooden fence is probably built to enclose the fourth side. Breaks in stone walls probably indicate former gate holes.

Stone walls are concentrated in parts of the state containing stony soil, at elevations ranging from 700'-1,700-1800'. The Champlain Valley probably has the lowest concentration of stone walls due to its topography and the nature of its soils. According to Dorney's study, "most of the walls in Vermont are in the woods now" (p.73); however, they were originally "concentrated near the house and either surround the house or radiate from it in spiraling arms that usually reach to the lot lines." (p.67) As such, a network of stone walls may lead to the associated cellar hole(s) of a former farmstead. In addition to their location along field and lot lines, stone walls are also frequently found along roads.

The common board fence is another type of fencing, and is mostly used for barnyards. This type of fencing simply consists of a series of sawn boards attached to a succession of wooden posts.

Finally, barbed-wire fencing came into use during the last quarter of the 19th century. Barbed wire was invented out West in the 1870s by a Mr. Glidden, formerly of resident of Cornwall, Vermont. It was first used in Vermont some time around the turn of the century. Early barbed wire was quite different from the kind we are used to today. It consisted of a metal strip cut with one edge jagged and then twisted and attached to a series of posts set into the ground at measured intervals. This type eventually gave way to various types of barbed wire fencing, including the kind which consists of two twisted pieces of wire with a series of "barbs" or cut wire ends placed at intervals along strings of twisted wire which are stapled on to wooden fence posts.

Variations:
Stone walls were frequently paired to create narrow lanes.

Changes over time:
Fences are subject to mending, removal and deterioration. Stone fences are frequently covered over time by trees, shrubs and other growth.

III. Significance

While it is unlikely that there are any wooden farm fences in Vermont that date to the 19th century, there are still a number of stone walls dating to the last century. Stone fencing was common throughout much of the 19th century in most parts of the state. According to a recent study of stone walls in Vermont, they "do not occur uniformly throughout the Green Mountains, but are concentrated in certain soils and topographic locations." (Dorney, p.8) Stone walls occur on predominantly stoney soil, at an elevation ranging from 700' and 1,700-1,800'.

When dairying became the leading agricultural activity in Vermont during the latter decades of the century, many farmers began to use the less durable, but more effective and labor saving barbed wire fencing. Today, changing land-use throughout the state, and the practice of stone looting by people intending to build new "old" stone walls elsewhere poses additional threats to the continued existence of stone walls.

Fences were built as a means of demarking lot lines and roads, as well as to keep livestock out of cultivated fields. In

some cases, they were a useful by-product of land clearance as the stones and tree stumps, rather than being discarded, were instead used for building much needed fencing. The old stone walls which have survived a century or more can show us where former lot lines were, where old roads were, and how a farmer subdivided his land for different agricultural uses. In addition, they serve as the best means of understanding an important and often overlooked type of building technology.

Fence building was a laborious and time-consuming job, and although it was occasionally an autumn task, it was more typically undertaken during the month of April after the busy weeks of the maple sugar harvest were over, and there were still a couple of weeks left before May when the livestock were put out to pasture for the summer.

Alongside factors of cost, the type of fencing used often depended upon the kind of livestock it was being used for. Smaller livestock such as pigs and sheep, for example, required much tighter fencing than larger animals. In addition, sheep could not be fenced in with barbed wire due to the obvious danger it posed for their woolly coats.

IV. Registration Requirements

I. Name of Property Type Cider Mill

II. Description

Cider mills are generally gable roofed, wood frame structures with stone foundations. They are typically 1.5 or two stories high and contain enough room for a grinding mechanism on the top floor, a press and storage space for the barrels on the main floor, and a basement where the mechanical equipment was located, and possibly where the filled barrels were stored. Windows are typically located on the main, and possibly top floors to allow enough light to work by, as well as for ventilation purposes. While some cider mills used horse power, others were powered by water in which case they were built on a river or next to a mill pond and contained a water wheel.

Variations:
Some of the early cider mills were housed in grist mills. Early grist mills were multi-functional and included lumber, seed and cider in their operations.

III. Significance

Cider has been a popular drink in Vermont since the early days of settlement. Even as late as the turn of the 20th century, more apples were used for cider than for eating or cooking. During the late 18th and early 19th century, much of the cider made in Vermont was made into apple brandy. Both brandy and cider were stored in the house cellar or a separate stone root cellar. While some families had their own small grinding and pressing mechanisms, often a large press was shared by an entire community. In this case, a cider mill was constructed to house the necessary equipment.

The traditional cider making process is a very straightforward one. After the apples were picked, they were stored in a series of very large wooden crates, either outdoors, or if there is room, inside the mill. They were then carried to the second floor where they were allowed to ripen until soft. When they reached the right tenderness they were placed in the grinder located directly above the press. While today apple grinders are operated by electrical power, in the 19th century grinders were run by horse or water power. Once the apples were ground, the pulp or "pomace" was dropped down into the press. Prior to the use of cloth, a common feature on today's

presses, the earlier method was called an "oat-straw" process wherein alternate layers of pomace and straw were placed in the press. The straw equalized the pressure from the press and allowed the juice to escape in a sieve-like fashion. The cider was subsequently drawn off into a wooden tub and poured into cider barrels.

IV. Registration Requirements

I. Name of Property Type Nursery/Greenhouse

II. Description

The size of nurseries can range from one acre to fifty or more. The early nurseries had packing houses which were large, wood-frame buildings with stalls around the perimeter for sorting young trees.

The widespread use of greenhouses, glassed-in structures for the cultivation of young plants, accompanied the development of scientific methods of plant and tree growing. Although they can be found on gentleman farms and estates of the late 19th and early 20th centuries, they do not become common in commercial nurseries until the 20th century. Greenhouses are typically low, gable-roofed glassed-in buildings with concrete (or stone) foundations. Underground metal, and possibly wood piping leading from a water source to the greenhouse is expected. There also may be a chimney for stove or boiler.

Refuse deposits are often minimal, although they may contain discarded implements and architectural trash.

The geographic distribution of nurseries is not well documented; however, it appears likely that many nurseries are located in the Champlain Valley where the soil and terrain are especially conducive to nursery farming.

III. Significance

Commercial nurseries were extremely rare in the 19th century. After 1900 they became increasingly popular, and by 1928 there were 36 commercial nurseries in Vermont, mostly in the Champlain Valley.

Although there were nurseries in Vermont as early as the 1820s, it was not until after 1900 that the nursery industry in Vermont developed to any significant degree.

The second half of the 19th century witnessed a growing interest in horticultural science both in Vermont and in the nation at large. Alongside the organization of various horticultural societies, and the publication of horticultural reference books, a few commercial nurseries were established in Vermont at that time. Moreover, gentlemen farmers of the

late 19th century often built greenhouses on their farms where they experimented with various fruits and other plant varieties.

After 1900, improvements in methods of growing plants and trees, alongside an expanding consumer market for such products, led to a heightened interest in both the science and the economic benefits of nursery farming; by 1928 there were some 36 nurseries in Vermont. Vermont's nursery industry served a largely local market, and was described in a 1928 article in The Vermonter as being a "Vermont industry to help Vermonters." The products grown on these farms included trees, shrubs, flowers, vegetables, ferns and berries.

IV. Registration Requirements

I. Name of Property Type Mink/Fox Shed and Feed House

II. Description

While the animals themselves require special care, the actual buildings necessary for raising mink and fox are relatively simple. Shelter typically consisted of long, low wood frame, single story sheds divided into a series of pens on the inside. Where outside runs were built for foxes, mink had to be contained inside most of the time to prevent the sun from singeing their fur.

The feed house was a one or two story wood-frame or concrete building with a concrete foundation. In terms of size, it required room enough to house the grinding machine where the meat of other animals was ground into feed, a refrigeration space to keep the meat fresh, and finally, an additional room or floor where the animals were skinned.

Variations:
On large fox farms, in conjunction with the main shed, a small tower was often built as a means of monitoring breeding activities. These towers were typically 10-15' high and consisted of a small, box-like wooden structures supported on four posts, located in or adjacent to the outdoor fox runs. The enclosed structure at the top contained a window, and was just large enough to seat one person who manned a series of ropes with which the doors to the various pens were opened and closed.

III. Significance

Mink farming was neither extensively practiced, nor was it very long-lived. Since the 1940s the number of mink ranches in Vermont has steadily declined, and today there are only three or four known ranches in the state.

Both mink and fox farming were practiced in Vermont during the 1920s and 1930s in part in an effort to reclaim some of the state's abandoned farmland, and in part as an agricultural sideline to provide an additional source of income. It is one of a number of ways in which Vermonters have attempted to diversify, shifting from mainstream agricultural activities such as dairying, to more unusual, relatively short-lived specialty activities less prone to large-scale, out-of-state competition.

IV. Registration Requirements

I. Name of Property Type Canning Factory

II. Description

The Vermont Business Directory listed three canning companies in Essex Junction, Waterbury and Randolph. Canning companies were chartered with the state in Norwich, Burlington, South Newbury, and Windsor. Grand Isle had a corn canning factory in the late 19th century.

III. Significance

According to Everett Willard of the Vermont Department of Agriculture there are no historic canning factories left in Vermont. It is not known whether there are any former factories still extant, either as archeological remains, or as a standing structure used for some other purpose.

The Civil War stimulated the development of canning as a means of mass-producing and marketing farm produce. Until the close of the century canning was largely a home industry. Home garden plots produced ample vegetables for home canning and family use. Around 1890 farmers raised sweet corn, snap beans and cucumbers for the canning companies which had begun to appear in Vermont.

IV. Registration Requirements

I. Name of Property Type Starch Factory

II. Description

The limited amount of information available at this time suggests that a starch "factory" consisted simply of a building or room large enough to house the necessary processing equipment.

Refuse deposits will be limited but may contain agricultural trash and discarded tools and equipment.

Changes over time:
Former starch factories were sometimes converted to other uses such as a residence or another factory use.

III. Significance

Starch factories were first built in Vermont around the 1830s. After the Civil War when potatoes were raised more for eating and and seed stock than for starch or distillation, the number of starch factories began to decline. Between 1870 and 1890 the number of starch factories in Vermont dropped from forty-four to two.

Beginning around the 1830s when potatoes began to be raised extensively throughout the state, surplus potatoes were often sold to local starch factories where potato starch was extracted for the "sizing" of clothing. Starch-making consisted first of grinding the potato to a pulp, then placing the pulp in a large vat where the water was drawn off, after which it was spread on a series of racks to dry.

IV. Registration Requirements

I. Property Type Windmill

II. Description

Once fairly common features of the agricultural landscape, windmills are a very rare property type in Vermont. They may either be structures attached to the top of another building (such as a well or pump house) or a separate structure. Early windmills had an open wooden structure with a wooden wheel at the top to catch the wind and generate power. Later windmills had a metal frame structure. Most windmills have disappeared over time, although the metal pinnings to the ground may still exist.

III. Significance

Leonard H. Wheeler, who grew up in Bridport, Vermont, invented the Eclipse Windmill while doing missionary work with the Ojibwa Indians in Odanah and La Pointe, Wisconsin. His windmill was patented in 1867. These windmills were used by the Indians to pump water and grind grain. Many of these windmills were also used in Bridport and in other Vermont towns.

Windmills were of significant need on farms before electricity as they provided the power to pump water from the well to the barns and the farmhouse. This was a great labor saving as water had previously been pumped by hand.

IV. Registration Requirements

G. Summary of Identification and Evaluation Methods

Discuss the methods used in developing the multiple property listing.

See continuation sheets for full text.

[X] See continuation sheet

H. Major Bibliographical References

See continuation sheets for full text.

[X] See continuation sheet

Primary location of additional documentation:

- [X] State historic preservation office
- [ ] Other State agency
- [ ] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Specify repository: _____

I. Form Prepared By

name/title Division for Historic Preservation
organization " date August 1991
street & number 58 East State Street telephone (802) 828-3226
city or town Montpelier state Vermont zip code 05602

Summary of Identification and Evaluation Methods

The multiple property listing for the agricultural resources of Vermont is based on the theme, "Agriculture (1760-1940)", in the Vermont State Historic Preservation Plan and the Vermont Historic Sites and Structures Survey (VHSSS), which was begun in 1971. The historic contexts in this MPS are all found in the Historic Preservation Plan. The survey has generally been conducted on a town by town basis, starting in the southern part of the state and moving northward. Survey forms for agricultural properties in the counties of Addison, Franklin, and Caledonia were reviewed in depth to gather much of the specific information about agricultural properties for the property types section.

The geographic area for this context was determined to be the entire state because many of the trends in agriculture were experienced in all or most parts of the state. The time period if from 1760, when the first permanent white settlement began in Vermont, to 1941.

The initial property type for which registration requirements have been developed is "farmstead," as this is the property type most likely to be nominated to the National Register.

The standards of integrity were based on the National Register of Historic Places standards for assessing integrity. Information from the VHSSS and knowledge of the condition of existing properties was used to determine the degree to which allowances should be made for alteration and deterioration.

GENERAL REFERENCES ON VERMONT AGRICULTURE

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