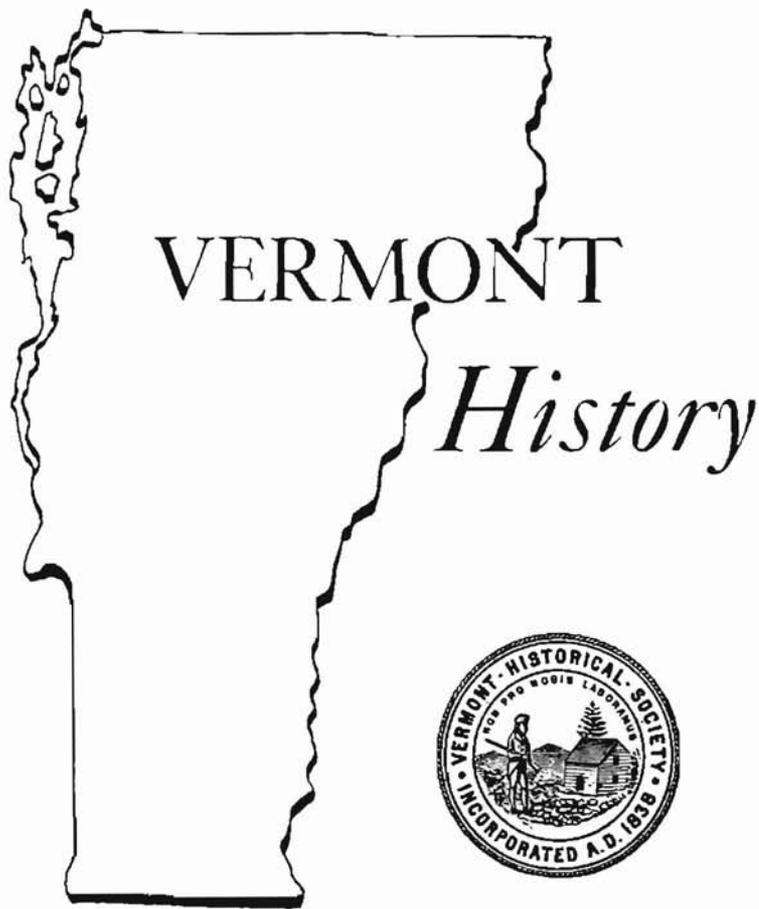


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## *In This Issue*

Contributors To This Issue	.....	76
Editor's Comment: Vermont's Stone Chambers and the Nature of History	.....	77
Vermont's Stone Chambers: Their Myth and Their History By GIOVANNA NEUDORFER	.....	79
Celtic Place Names in America B.C. By W.F.H. NICHOLAISEN	.....	148
A Vermont Bookshelf: Vermont Books in Review	.....	161

TABLE 3  
 COMPASS ORIENTATIONS OF CHAMBER ENTRIES<sup>a</sup>

	NORTH	SOUTH	EAST	WEST	NORTHEAST	NORTHWEST	SOUTHEAST	SOUTHWEST
7		X17°						
8					X50°			
10							X118°	
11		X200°						
13			X98°					
22				X286°				
23			X90°					
24							X153°	
28		X182°						
30			X110°					
37		X178°						
40								
53								
54		X180°						
TOTAL								
TYPE A	1	4	3	1	1	0	2	0
%	8%	33%	25%	5%	8%	0%	17%	0%

TYPE B

1			X108°					
2			X112°					
3		X180°						
4			X70°					
5			X98°					
6	X356°							
9		X198°						
12			X108°					
14		X180°						
15			X98°					
16		X <sup>c</sup>						
17							X136°	
18							X154°	
19			X 98°					
20		X199°						
21								X212°
25								X204°
26			X86°					
27			X80°					
29								X208°
31			X88°					
32							X126°	
34								X242°
35			X100°					
36			X106°					
38			X100°					
39								
42			X <sup>b</sup>					
49								
50				X <sup>b</sup>				
TOTAL								
TYPE B	1	5	14	1			3	4
%	4%	18%	50%	4%			11%	14%
TOTAL								
ALL	2	9	17	2	1	0	5	4
TYPES	5%	22%	42%	5%	3%	0%	12%	10%

- a Compass readings were sighted from center rear of chambers through center of entryways.  
 Compass declinations: 14° for Windham County chambers; 16° for all others.  
 b Data not available.  
 c Rear of chamber inaccessible.

not visible at all or largely obscured by an encircling hillside or banked earth. From a sample of twenty-nine chambers, twenty-six are of dry wall construction on their exteriors, two are fully mortared and one exhibits a combination of dry wall and mortar. The relative absence of exterior wall mortar contrasts to its more frequent appearance on interior walls, where in most instances mortar is found in the interstices between stones, which strongly suggests it was a feature of original construction. The large majority of chambers, thirty-five or ninety percent, are of random rubble construction consisting of laid up, uncut fieldstone of irregular shapes and sizes. Although only nine chambers exhibit wedge or splitting marks, weathering hampers an accurate assessment of whether or not stones were dressed prior to utilization. Simple splitting, for example, is often impossible to determine on the easily cleaved limestones and schists which naturally outcrop only inches thick.<sup>72</sup>

In size, the thirty-one rectangular or square chambers range from 1.63m (5'3") to 6.34m (20'8") in length, from 1.12m (3½') to 3.52m (11'5") in width, and from 0.70m (27½") to 2.32m (7½') in height. The diameters of the four circular or semi-circular chambers average 2.86m (9'4").<sup>73</sup> Although the largest chambers tend to be of Type B construction, this class of chamber exhibits the largest variation; Type A chambers tend to be more uniform in size. (See Table 4.)

TABLE 4  
CHAMBER DIMENSIONS

	LENGTH	WIDTH	HEIGHT		LENGTH	WIDTH	HEIGHT	DIAMETER
TYPE A				TYPE B				
7	4.13	3.21	1.75	11	2.26*	1.66*	0.85*	
8 <sup>b</sup>	1.38 Ave. Dia.		1.07*	12	3.33*	1.63*	1.50*	
10	4.60*	1.81*	1.84*	13 <sup>b</sup>			1.60	2.28*
11	4.55*	2.38*	1.74*	14	(3.30)	(2.55)	(1.50)	
13	3.12*	1.83*	1.39*	15 <sup>a</sup>				
22	2.18*	1.12*	1.22*	16			1.58*	2.75
23	3.00*	1.51	1.97	17	4.14*	1.67*	1.51*	
24	4.02*	1.80*	1.32*	18	5.21*	2.85*	1.56*	
28	6.23*	2.27*	1.83*	19	4.00*	3.37*	1.74*	
30	3.35*	1.66*	1.64*	20	4.45*	2.67*	2.07*	
37	2.54*	1.62*	1.55*	21	a	2.40	1.70	
40 <sup>c</sup>				22	2.31*	2.39	2.14*	
53 <sup>d</sup>				23	1.63*	1.37*	0.70*	
54	2.00	1.19	1.47	24				
AVERAGE	3.61	1.85	1.57	25	3.63	1.30*	1.79*	
				26	2.64*	1.81*	1.97*	
				27	6.34*	1.56*	1.53*	
				28	4.43*	3.39*	1.72	
				29	3.99*	2.64*	1.55*	
				30			1.55*	3.54*
				31	5.95*	3.40	1.84	
				32	6.13*	2.98*	2.11*	
				33	3.16*	2.17*	1.53*	
				34	5.35	1.57*	1.55*	
				35	(2.95)	(0.84)	(1.33)	
				36	3.85	1.93*	1.66*	
				37				
				38	3.66	2.44	1.79	
				39				
				40				
				41	5.66	3.52	2.32 <sup>c</sup>	
				42				
				43				
				44				
				45				
				46				
				47				
				48				
				49				
				50				
				AVERAGE	4.11	2.32	1.66	2.86

- \* Average of two.
- Average of three.
- a Data not available.
- b Irregular more than circular.
- c Maximum height of arched roof.
- d Main chamber has collapsed; measurements are of entry passage only.



*Chamber No. 26. Collapsed hillside chamber (Type B), Orange County. Note details of ceiling construction and side wall masonry.*

*Chamber No. 14. Hillside chamber (Type B), Windsor County. Note entryway lined with large upright slabs.*

Although the floor plans of the chambers exhibit individual variation, the majority are rectangular with a four-cornered interior. Six L-shaped structures have extensions or "ells" either to the left or to the right from the entry. Two chambers are square; one is round; and three are semi-circular or irregular. The majority of chambers have straight-sided walls perpendicular to the ceiling and describe a box. The only fully corbelled chamber is the lone circular structure [No. 6]. Four chambers combine straight lower lateral walls and partially corbelled upper walls.<sup>74</sup> With two exceptions, all the chambers have earthen floors. One structure [No. 1] has a flat bedrock floor extending out from the chamber entry. A carved lengthwise groove runs the length of the bedrock slab, extending from the center back of the chamber to the exterior through the entry. The only fully mortared chamber has a cement floor.<sup>75</sup>

Whatever the construction type and individual variations in size and other structural details, with but two exceptions, all the chambers were built with stone ceiling slabs. (See Table 5.) (One of the two exceptions [No. 40] was built off and entered through the foundation of a larger structure and has a ceiling of wooden logs. The other [No. 50] has a unique arched ceiling of mortared random rubble construction.) The salient feature of the stone slab ceiling construction architecturally connects all the stone chambers and forces a comparison between many otherwise dissimilar structures. With the exception of one chamber (described below) the ceiling slabs span the entire width of the chambers. Laid perpendicular to the side or lateral walls (which support them) and parallel to each other, the slabs range in number from one to ten. The ceiling slab construction varies, ranging from a neat row of slender slabs to the use of several rougher-looking, broader stones. A close examination of the tiny spaces between the ceiling slabs in some of the hillside chambers discloses a layer of smaller stones laid upon the large ceiling slabs prior to covering the chamber over with earth. Some of the chambers thus appear to have a greater thickness of soil covering on their roof than is actually the case.<sup>76</sup>

The lone exception to the basic ceiling slab type of construction is a unique, semi-round subterranean chamber [No. 3] entered via a small triangular opening at the top of the mound. Rather than being laid parallel to each other and spanning the width of the chamber, the three irregularly shaped ceiling slabs overlap rather intricately to form the triangular entry.

Generally, the number of slabs per chamber depends both on the size of the structure and the sizes of slabs used. A comparison of Tables 4 and 5 indicates that small chambers do not necessarily have fewer ceiling stones. For example, although Chamber No. 31 is one of the largest

TABLE 5  
CEILING CHARACTERISTICS

	NUMBER OF SLABS	DRESSED/TRIMMED	NATURAL BEDROCK	WEIGHT OF 3 LARGEST SLABS <sup>d</sup>		
				#1	#2	#3
TYPE A						
7	10		X	1185	792	620
8	10		X	234 <sup>c</sup>	73	247
10	7		X	734 <sup>c</sup>	1565	1721
11	9		X	1208 <sup>c</sup>	1643	1241
13	3		X	1573	1541	393
22	5		X	706	547	a
23	3+		X	1764	a	a
24	7		X	a	a	a
28	3+		X	4157	9858	569
30	5		b	293	829	1420
37	4		b	1601 <sup>c</sup>	1084	1700
40 <sup>a</sup>						
53 <sup>b</sup>						
54	3		X			

TYPE B

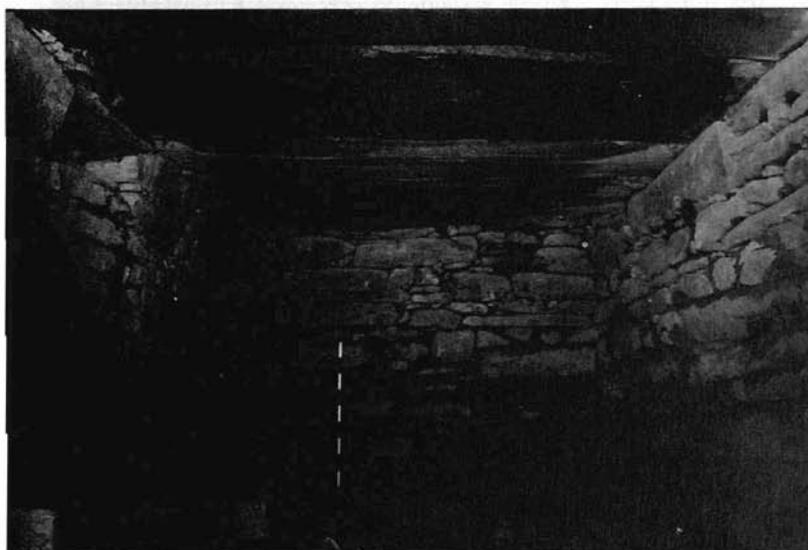
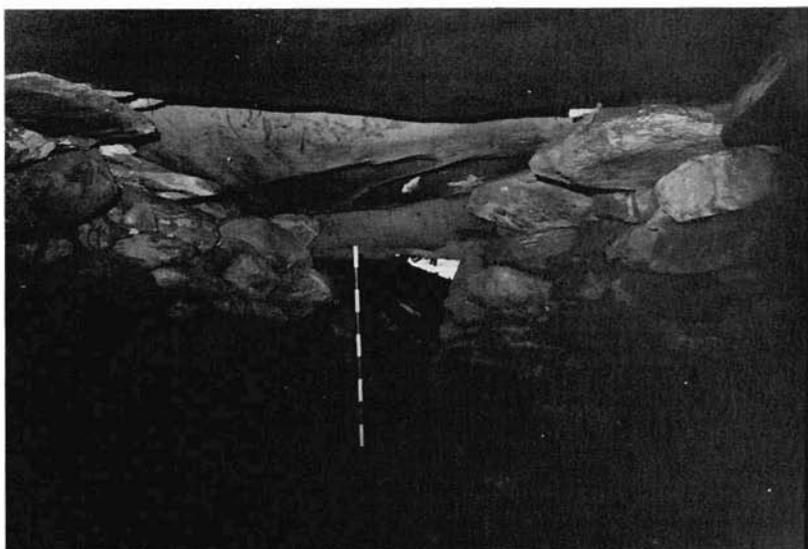
1	5		X	a	a	a
2	4		X	691 <sup>c</sup>	594	1466
5	3		X	691 <sup>c</sup>	1460	a
4	5*		X	1964	637	a
5 <sup>a</sup>						
6	6		X	a	a	a
9	6		X	4205 <sup>c</sup>	1365	1021
12	5		X	1593 <sup>c</sup>	7692	4185
14	5		X	768 <sup>c</sup>	a	a
15	8		X	a		
16	2+		X	5081	9059	
17	1			3719		
18	3		X	625 <sup>c</sup>	698	a
19 <sup>a</sup>				a	a	a
20	3		b	a	a	a
21	5		X	564 <sup>c</sup>	a	a
25	3+		X	1698	a	a
26	3+		X	4150	1627	1678
27	6		b	408 <sup>c</sup>	4892	1485
29	3		X	788	a	a
31	4		X	6515	1901	3969 <sup>c</sup>
32	9		X	2822	3409	5769
34	3		X	a	a	a
35	5		X	633 <sup>c</sup>	a	a
36	2*		X	a	a	a
38	5		X	2576 <sup>c</sup>	a	a
39	9		b	a	a	a
42 <sup>a</sup>						
49 <sup>a</sup>						
50	Arched Ceiling		Random Rubble			

a Data not available \* Passage entry only; presently collapsed inner chamber probably also capped with slabs.

b Not determined

c Lintel stone + May originally have been additional slabs

d Compared to denser, more compact marbles the recrystallized limestones of the Waits River and Gile Mountain Formations are lighter in weight. Although the marble industry uses 168 lbs. per cubic foot for calculating stone weight the weights of the ceiling slabs were computed on the basis of limestone density (110-160 lbs. per cubic foot). Since the Waits River limestone falls to the lower side of the scale, the formula of 135 lbs. per cubic foot was used to compute the weight of the ceiling stones. Not all chambers were constructed of the recrystallized limestones, however, and several of the weight calculations tend to the low side. Slab weights were computed only for those stones for which adequate thickness, width and length measurements were available.



*Chamber No. 29. Hillside chamber (Type B), Windsor County. Ceiling slabs are of Waits River limestone; note details of ceiling construction.*

*Chamber No. 11. Chamber built off barn foundation (Type A), Windsor County. Note details of ceiling construction.*



*Chamber No. 3. Close-up of small triangular entryway. From outside looking in.*

*Chamber No. 3. Triangular entryway, composed of overlapping ceiling slabs. From inside looking out.*

structures with a length of 5.95m (19'5"), it only has four ceiling stones in contrast to Chambers Nos. 7 and 8 with respective lengths of 4.13m (13½') and 1.85m (6') which each have ten ceiling stones. Although a number of ceiling stones weigh several tons, most fall within a quarter ton to one ton range. Because it is frequently impossible to determine the thickness of a ceiling stone, a critical factor in calculating its weight, weight approximations should not be attempted on the basis of a slab's length or width. (See Table 5.)

Only ten chambers, all Type B and built into hillsides, exhibit what appear to be vent holes. Most often located in the upper back wall of the structure's interior and extending up through the sod layer covering the chamber, the vents average 0.37m (14½") in length, 0.25m (10") in width and 0.60m (23½") in height. Incorporated into the masonry, the vent openings range in appearance from roughly constructed holes to neat, rectangular chimney-like structures.

Repeated summer field observations suggested that the ambient temperature within the chambers was always less (or cooler) than the outside temperature. Maximum and minimum interior and exterior temperature readings recorded over two to four hour periods for the fifteen chambers in the best state of preservation (with no attempt to cover open entryways) revealed that regardless of structural differences, interior temperatures of 56° - 62°F. are maintained in summer weather conditions of 66° - 83°F.

In addition to the more discrete physical attributes of each chamber, with one exception, all of the stone chambers are physically associated with a late eighteenth century or nineteenth century farm complex, either in use or abandoned. An understanding of the history and structural development of the farms is difficult; homesteads did not exist as fixed entities in time and the make up and location of buildings frequently changed. Over the years, buildings housed a variety of functions, and the present absence of physical evidence does not preclude the existence of a structure on a particular spot. In some instances, a house was built on the foundation of an earlier structure; in other cases informants who express knowledge of an older house are not certain of its exact location or date of construction. Log cabins, for example, seldom had foundations, making their sites difficult to locate.<sup>77</sup>

Table 6 presents the currently observable cultural environment related to each chamber and provides distance measurements between chambers and particular cultural features. One chamber [No. 36] is located near a barn foundation but there is no present evidence of a related dwelling; another [No. 2] is located 84m southwest of a three sided depression which may or may not mark the site of a previous habitation or barn; and a late

TABLE 6  
CULTURAL CONTEXT OF CHAMBERS

	DISTANCE FROM HOUSE	DATE CONSTRUCTED	DISTANCE FROM HOUSE FOUNDATION HOLE	DISTANCE FROM BARN/OUTBUILDINGS	DISTANCE FROM BARN/OUTBUILDING FOUNDATION HOLES	DISTANCE FROM ROAD	WATER SOURCE/DISTANCE	PROPERTY FIRST SETTLED
TYPE A								
7	12m	c. 1760		chamber under carriage shed.		87m	*	c. 1760
8	chamber in basement	c. 1760		12m		75m	*	c. 1760
10	30m	c. 1855		chamber on lower level of barn.		80m	*	pre-1816
11		c. 1807	3m		chamber within barn foundation hole.	15m	well-70m	1833?
13		+	chamber within foundation hole.			20m	well-6m	a
22	adjacent	a			chamber extends off barn (?) foundation hole.	25m	*	c. 1800
23		+	chamber within foundation hole.			20m	*	c. 1768
24		+	20m		barn-15m; chamber extends off shed foundation hole.	10m	*	1778?
28	38m <sup>d</sup>	pre 1855		63m	chamber extends off cider mill foundation hole.	60m	well-38m	1784?
30		+	chamber within foundation hole.		barn - 43m	3m	brook-20m	a
37		+	chamber within foundation hole.		barn - 32m	x <sup>a</sup>	*	a
40		+	x		barn; chamber extends off foundation hole. <sup>c</sup>	x <sup>a</sup>	*	a
53	x	1840 <sup>d</sup> +	x		chamber extends off barn foundation hole.	x	*	a
54		+	chamber within foundation hole.			15m	10-15m	a

	DISTANCE FROM HOUSE	DATE CONSTRUCTED	DISTANCE FROM HOUSE FOUNDATION HOLE	DISTANCE FROM BARN/ OUTBUILDINGS	DISTANCE FROM FOUNDATION HOLES	DISTANCE FROM ROAD	WATER SOURCE/ DISTANCE	PROPERTY FIRST SETTLED
TYPE B CONT								
27	10m	c.1805		barn - 25m		15m	well-18m	c.1800?
29	55m <sup>d</sup>	a		55m		48m	*	c.1785?
31	6m	1807 +	X		barn - 39m adjacent to of chamber		rear**	pre-1809
32		+	10m <sup>c</sup>		2m <sup>c</sup>	75m	well-120m cistern-9m	c.1782
34	75m	a				8m	*	a
35	10m	1784-89 +	29m	barn - 1m		4.3m	*	a
36			6m <sup>b</sup>		30m <sup>c</sup> (barn?)	80m	spring-60m	1784?
38		+	27m		69m	35m	+	a
39	8m	c.1806		barn - 6m		2m	*	pre-1806
42 <sup>a</sup>						5m	a	pre-1824
49 <sup>a</sup>								
50	9m	c.1784				X	a	a

a Data not available.

b Possible foundation hole.

c Nature of foundation undetermined.

d Second house built in same site.

+ House foundation hole not dated.

X Evidence of feature; distance measurement not available.

\* Cases where a source not located but with a nearby farm complex, the assumption made that there was some provision for a steady supply of water.

\*\* Informed of one but could not locate.

	DISTANCE FROM HOUSE	DATE CONSTRUCTED	DISTANCE FROM HOUSE FOUNDATION HOLE	DISTANCE FROM BARN/ OUTBUILDINGS	DISTANCE FROM BARN/OUTBUILDING FOUNDATION HOLES	DISTANCE FROM ROAD	WATER SOURCE/ DISTANCE	PROPERTY FIRST SETTLED
TYPE B								
1	31m	recent +	32m		barn - 30m - 40m and other buildings.	16m	spring-29m	pre-1830
2			84m <sup>b</sup>	sugar house - 16m		170m	well-20m	c.1780's
3		+	38m			30m	brook-73m	c.1798
4	36m	recent +	16m	31m	barn - 32m	29m	well-28m	c.1788
5	18m	a +	35m	barn - 35m		70m	*	a
6	32m	pre-1800		carriage shed - 20m	barn - 13m	abandoned 70m used 23m	spring-70m well-24m	pre-1800
9		+	7m <sup>c</sup>			11m	brook-25m	c.1795
12	8m	1805		barn - 30m		27m	well-18m	pre-1801
14	55m	c.1807			7m <sup>c</sup>	28m	spring-26m	pre-1807
15	60m <sup>d</sup>	1840				45m	well-18m	c.1789
16	76m	1790	15 <sup>c</sup>	barn - X		41m	well-23m	1780?
17						c.4km.	well-18m	1795?
18	70m	n	X			58m	*	a
19	X	a			barn <sup>X</sup>	X	*	a
20		+	12m		barn - 14m	75m	spring-64m	a
21		+	8m			35m	well-14m	pre-1800
25		+	28m		barn - 39m	35m	well-30m	1775?
26		+	3 in vicinity closest at 30m			adjacent to rear of chamber	*	a

nineteenth or early twentieth century sugar house presently situated adjacent to this chamber may have been set upon a pre-existing foundation. Only one chamber in the entire sample [No. 17] stands completely isolated from any buildings or foundation holes, and several lines of evidence indicate that no buildings ever existed near the site. It is also the only chamber at any distance from a roadway, although it is nonetheless accessible by hiking about a quarter mile from an abandoned stage road. In all instances the roadways associated with chambers are old highways or turnpikes many of which are still in use.<sup>78</sup>

In a number of instances the masonry of foundations of associated structures is virtually identical to that in nearby chambers, which strongly implies that the same mason or masons built both the foundation and the chamber, probably in the same period of time. The five Type A chambers situated within foundation holes provide the best examples of chambers with masonry walls indistinguishable from the surrounding foundations. A professional stone mason emphatically stated that Chamber No. 32 and the house foundation nearby were built by the same person(s). Chamber No. 11 indisputably shares one wall with the barn foundation and it is unequivocally contemporaneous with or more recent than the attached barn.

Individuals who have questioned the origin of the stone chambers have generally ignored the potential information of oral tradition. In every instance local informants, often life-long members of communities which have chambers, had either grown up on one or more properties associated with the chambers or their families descended from the early settlers of the properties. As archival research confirmed, familial relationships in these small clannish communities are complex, frequently long-standing and highly interwoven, and the relationships can often be traced from one farm to another either within the same community or in neighboring towns. Because of these traits, oral tradition in rural Vermont communities provides a major and reliable source of largely undocumented but valuable historic information.<sup>79</sup>

The body of oral tradition concerning Type A chambers was thin. Those located within house foundation holes were referred to by many as bases necessary to support the massive chimney structures when fireplaces were huge and integral parts of dwellings. Tradition held that Chamber No. 8, a tiny bladder shaped structure located within the basement of a beautifully preserved pre-Revolutionary house, was built as a hide-out during Indian raids. One informant whose great-grandfather homesteaded the property associated with Chamber No. 28 indicated that the attached foundation hole supported a cider mill and the chamber served as a storage area where barrels of cider aged.

In contrast to the relative dearth of oral evidence available for the Type A chambers, a considerable body of evidence surrounds the Type B structures. An 1891 issue of the *Vermont Phoenix* refers to one chamber as "a stone pig pen . . . built by Mr. Lewis Miller in the apple orchard west of his house, where the pigs ran at large in the summer time. It was founded," the article continued, "upon a rock and covered with large flat stones and earth, making the enclosure look like a tomb."<sup>80</sup> Although the property associated with the chamber was "the Miller Farm" from 1830 until 1890, Miller himself died in the mid-nineteenth century, and the *Phoenix* based its information on an interview with Miller's daughter.

Unanimous opinion in one community identifies another chamber [No. 18] as a burial site, although descriptions of the deceased vary somewhat, from an Indian to a young girl. The most detailed oral tradition of any chamber [No. 17] concerns Oliver Plaisted, from whom comes the chamber's local designation as Oliver's Cave. To avoid conscription into the army during the Civil War, according to the story, Plaisted, mentally unbalanced and too old for active duty, fled to a wooded mountainside on the property of his former tutor, Joel Ellis.<sup>81</sup> While some versions of the story claim that Plaisted utilized a pre-existing structure, most versions state emphatically that he built the structure himself. The authenticity of the latter version is supported by the fact that a local man owns the jackscrew with which Plaisted supposedly raised the single roof slab into place. The jackscrew has been in the man's family ever since his grandfather took it in trade from Plaisted for fodder for the lone cow which lived on the mountain with the unbalanced draft dodger. Plaisted and his activities provided a common source of local gossip in the nineteenth century, and one informant, born in 1898, indicated that he had heard many tales about poor Plaisted both from his father, born in 1868, and his grandmother, born in 1838.

Local residents refer to a number of Type B chambers as root cellars. Many have stood empty for decades, but some have been used for storage of foodstuffs within recent memory. One man remembers talking in the 1930's to an eighty-year old descendant of the family who homesteaded the property associated with one chamber [No. 16]. The old man told him that two chambers [Nos. 14 and 16] were built as root cellars and one had a door, long since removed. A resident of a town with another Type B chamber [No. 2] recalled shelves, now gone, which once lined the walls of the structure and affirmed that it served for root storage. Another chamber No. 36 was constructed by a Mr. Woodward [b. 1819] for use as a "root and grain" cellar. This informant remembers her grandmother-in-law (a Woodward) commenting, after having moved from the property, that she missed the old root cellar as the one under her

new house did not keep food as well. Two other informants indicated that two other chambers in the sample [Nos. 12 and 31] were built as root cellars, that it was common knowledge in the community, and that the information had been handed down from older generations. One informant provided an excellent example of "the powers of memory of successive generations."<sup>82</sup> Many years ago he talked with a man in his sixties whose father had told him that *his* own grandfather had helped build five of the chambers as root cellars [Nos. 9, 12, 31, 36 and 43]. The construction of three of these chambers as root cellars is repeatedly mentioned, and in two cases the informants place the chambers back at least four generations in time.

Some chambers have been utilized in recent times for food storage, and apparently one chamber [No. 27] currently serves as a food storage facility in which carrots and turnips, packed into plastic containers, reportedly keep well all winter. Another structure [No. 29] has been variously used for lambing sheep, as a root cellar for storage of mangel wurtzel and most recently for housing cabbages fed to poultry. Archeological investigations of the chamber entryway uncovered a sheep shearing implement as well as other nineteenth century trash.<sup>83</sup> According to the present property owner, related by marriage to earlier settlers of the property, its vent was enlarged so that the cabbages could be rolled down into the structure. Another chamber [No. 31] was used for potato storage at one time. An informant who grew up near another chamber [No. 39] remembers that apples, vegetables and cider were kept in this structure and fondly recalled that the cider was excellent after wintering over in the chamber.

According to informants, three chambers [No. 15, 34, and 39] were built as family burial vaults. One of them [No. 15], built in 1828, had two family members entombed there until the 1890's when they were re-interred in the public community cemetery. Another chamber [No. 49], the burial tomb of Major David Wright and five members of his family, was built by Wright in 1814 after the death of his wife Hannah.<sup>84</sup> The lone chamber [No. 50] in western Vermont is rumored to have been built as an ammunition storage berm during the War of 1812.

Despite the wealth of oral tradition, an examination of deeds, land records, road surveys and proprietary records associated with the land and farms on which the chambers are located revealed no mention of them. The deeds generally contain statements such as "home farm with land and buildings" and make no specific description of any of the structures. Of all the maps examined, only one town map, produced in 1949 and showing the lot lines with houses and roads in existence "about 1800 (between 1762-1891)," notes the location of chambers. This map, which shows two



*Chamber No. 17. Freestanding chamber, unrounded (Type B), Windsor County. The only chamber not associated with an abandoned or existing farm complex and locally identified as Oliver Plaisted's hideout.*

chambers [Nos. 1 and 3], does not identify two other chambers [Nos. 2 and 4] also in the neighborhood, and two other nearby stone chambers destroyed within the last generation.<sup>85</sup>

The burden of the oral evidence indicates that many of the chambers served a variety of purposes closely associated with nineteenth century rural living in northern New England, and further that at least some were constructed specifically for such purposes. But this evidence does not prove that each individual chamber or even the general mode of their construction developed out of local historic traditions and technologies or served a needed function in that context. Furthermore, while the descriptive data demonstrate that the chambers exhibit certain common patterns of location and construction and point to distinctive traits of particular structures, these data do not indicate either their date of construction or their purpose. The answer to the fundamental question of whether or not the chambers are deviant to their setting thus demands an examination of the setting, both environmental and cultural. As virtually all the chambers are situated in late eighteenth century and nineteenth century farmsteads, the setting is, then, defined by all pertinent historic, economic, and agricultural factors.

Early settlement in Vermont gravitated toward the higher elevations rather than in river valleys. In the period between 1760 and 1830 settlement and the farmsteads were characterized by self-sufficiency, a subsistence pattern which further contributed to the location of the hill farms. The bulk of the needs were met on the farm itself diminishing the necessity of easy transportation and communication.<sup>86</sup> Virtually all the chambers are associated with upland farms situated mostly above 1000' elevation.

The utilization of hillside or banked architecture is apparent in New England and elsewhere in the early settlement period. New settlers typically built a small, temporary shelter which could be rapidly constructed and easily heated in winter.<sup>87</sup> In parts of New York state, for example, settlers customarily used temporary dwellings for up to seven years prior to building a permanent dwelling.<sup>88</sup> In Vermont the head of the household and older sons often spent one or more summers preparing the land before moving the entire family, basic household possessions, and livestock. Availability of materials, exigencies of landscape, and architectural traditions determined the type of temporary dwelling which included: conical huts of branches, rushes, wattle and turf;<sup>89</sup> bark houses;<sup>90</sup> sunken pits;<sup>91</sup> and "dugouts," "caves," or "cellars" built into hillsides.<sup>92</sup> While the use of branch, rush, wattle, clay, and mud shelters derived from building types well known from English country districts,<sup>93</sup> construction techniques which incorporated available banks or hillsides appear to be a local response to the cold winters and generally hilly topography of the Northeast and Mid-Atlantic region. Although not a common practice, these pioneers sometimes used stone to line the dugouts:

These cellars were made by digging a shallow pit in the ground, preferably in a bank, and then lining the sides of the excavation with stone walls carried above the ground enough to give a height of about seven feet [ca. 2.1m], or by setting against these sides upright logs long enough to give the same height. These stone or wood walls were then banked high with earth on the outside . . . and were roofed over either with logs laid close together and plastered with clay, or with bark or thatch on poles. The probability is that the roofs were of considerable pitch and were thatched.<sup>94</sup>

The construction of hillside dugouts as a temporary form of dwelling was not limited to New England; such dugouts were common in eighteenth century Pennsylvania,<sup>95</sup> areas of Wisconsin<sup>96</sup> and elsewhere in the Midwest<sup>97</sup> in areas settled in the nineteenth century. The widespread use of this functional construction technique over a long period indicates its adaptability. Further, its use from seventeenth century southern New England to nineteenth century Wisconsin clearly indicates that the banked over Vermont chambers represent an architectural tradition with deep American roots.<sup>98</sup>

The settlers abandoned temporary dwellings as soon as possible for log dwellings, which they considered an intermediate form of habitation before the construction of a frame, brick, or stone house.<sup>99</sup> From the earliest settlements to about 1830, houses with central chimneys were common to much of Vermont, and "the amount of stone used in [their] . . . construction was very great, and the sheer mass of this tremendous pile of masonry is astounding, when, as has sometimes happened, the house has collapsed and the chimney stack remains standing . . . More imposing in size than even the stack of the chimney at the 1st floor level was its foundation in the cellar. Chimney foundations 10 and 12 feet square [ca. 3.0 - 4.0m] and even larger, are not uncommon."<sup>100</sup> Oral tradition indicates that several of the chambers in the sample were built as supports for massive center chimneys. Five Type A chambers are situated within the four walls of abandoned foundation holes. While they exhibit the identical stone slab ceiling construction characteristic of the other chambers, they tend to be smaller than the other chambers and have neither earth covering nor vent openings. The fact that a "great many of these chimney bases are not filled with rubble but are left hollow" substantiates the oral tradition of their construction as chimney supports. "The purpose of the opening into the chimney base is a matter of conjecture: some say the space was used as a larder to keep food cool; others that it served as storage for wood ashes used for making lye."<sup>101</sup>

Settlement generally moved from south to north in Vermont, and several generations of pioneers repeated the well-established cycle from the first tenuous shelter to the comfortable farm house. Self-sufficient Vermont farms gradually entered the market economy.<sup>102</sup> Because of the short-growing season, the difficulty and expense of transporting bulky agricultural produce to market, poor soil and other factors, agriculture in Vermont's first decades presented a mixed picture. Only with the coming of sheep to the Green Mountains did Vermont find a staple product suited to the region. By 1830, Addison County "raised a greater number of sheep and produced more wool, in proportion either to territory or population, than any other county in the United States."<sup>103</sup> Most farms had kept a few sheep among their livestock for necessities such as wool, tallow, grease and meat, but by 1840 "not even in the south was there so much devotion to a single crop," frequently to the relative exclusion of all other agricultural activities.<sup>104</sup> In 1837, Rutland County had the largest sheep population in the state, followed by Windsor County, then Addison and Orange Counties.<sup>105</sup> By the mid 1840's, sheep raising began to decline for a variety of reasons, and many Vermont farmers turned to sheep breeding which remained a significant activity in western Vermont until the 1880's, when Vermont farmers had already begun to shift to

dairy farming.<sup>106</sup> Western grain, cheap and readily available since the advent of the railroads, increasingly provided a rich winter feed, making possible year-round milk production. The advent of the silo and the concept of ensilage in the 1880's further contributed to the ease with which cows could be supported throughout the winter.<sup>107</sup>

The changing agricultural patterns were clearly reflected in the kinds of crops which were raised and in the techniques of food storage. Because oral tradition links a number of the chambers to root cellars, the importance of root crops needs elaboration. Many local histories and other secondary accounts imply that corn and other grains, especially wheat, were the predominant crops raised for livestock in nineteenth century Vermont. Although wheat yields were high in the early years of tillage, land fertility dropped rapidly. Overuse and insufficient replenishment of nutrients brought on a rapid impoverishment of land, which in a matter of a few decades became a ubiquitous and circular problem, difficult to alleviate. Diminishing crop yields meant that fewer livestock could be supported and declining numbers of livestock caused a scarcity of fertilizing material for the next growing season.<sup>108</sup> Until the development of transportation facilitated importation of cheap western feed, Vermont farmers had to rely on their own ability to feed their livestock.

Concomitant with the declining grain yields, Vermonters increasingly turned to raising sheep, an industry which peaked in about 1840 with 1,700,000 sheep in the state.<sup>109</sup> This intensive period of sheep raising engendered crop diversification and use of all available produce to obtain sufficient feed.

Vermont farmers had to overcome the difficult problem of providing winter feed. Although the use of western grains, especially after the 1840's, significantly supplemented local crops, only after the introduction of the silo and the concept of ensilage could corn, wheat, and other forage crops be easily stored as succulent fodder. Northern farmers thus needed crops which were easily raised, nutritious, readily stored, and easily fed to their livestock throughout the winter. Root crops, which oral tradition closely links to the chambers, met all these needs.

Throughout most of the nineteenth century root crops were of major significance in Vermont and the New England's economy.<sup>110</sup> Farmer Ora Paul of Pomfret reported in 1878 that "through the long tedious winters of our latitude there is nothing so good as roots of some kind to promote the health and keep in thriving condition all kinds of domestic animals."<sup>111</sup> Henry Safford of Quechee wrote that "no farmer can afford to raise young stock or keep milch cows without an abundance of roots. I speak from twenty years experience in root raising."<sup>112</sup> Roots had many advantages: they were inexpensive to raise;<sup>113</sup> they retained their juices and