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B3: Paleo-Dunes and Other Post-Glacial Oddities in the Woods and Fields of New Sharon and Chesterville, ME

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PALEO-DUNES AND OTHER POST-GLACIAL ODDITIES IN THE WOODS AND FIELDS OF NEW SHARON AND CHESTERVILLE, ME

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INTRODUCTION

This field trip is a relatively easy set of hill-walks through select areas in the towns of New Sharon and Chesterville Maine (fig 1). Although many field researchers would not consider the towns of New Sharon and Chesterville Maine to be the most prestigious or awe-inspiring geologic research locations, the participation of high school students and other locals has allowed the hidden glacial and post-glacial treasures of these two towns to come to light (and there is at least one spectacular view along the way). The simple question,"Can you tell me what this strange mound of sand out in my back pasture is," and the astute observations of a high school student behind his house, launched an ongoing quest and a multiyear collaboration between the University of Maine and Mt. Blue High School earth science students to discover the story behind a collection of glacial and post-glacial deposits in this area. Although the trip principally highlights various post-glacial aeolian features, it also includes a crag-and-tail deposit, and glacial-marine deposits. If time permits, a short foray into the local uses for Cape Cod Hill Devonian granite is included as well.

TRIP REQUIREMENTS

Casual walking shoes/sneakers will probably be adequate for this trip, but since trip participants will be walking in woods and fields, light-colored, long pants as tick deterrent would be advisable. Bring a lunch and water bottle. Refills of water bottles will be likely, although bathroom stops will be spotty. That being said, several landowners have agreed to allow participants to use the facilities if necessary. Also, there is a general store (Douin's Market, at the intersection of Rte's 27 and 2 in New Sharon, 420624.80m E 4943142.95m N) with good sandwiches and other lunch supplies, very close to the starting point (fig 1). Since the trip will end back on Cape Cod Hill at Stop 1, it will be possible to consolidate vehicles, and leave some at that location.

LOCATION AND GENERAL SETTING

The two general locations that are the focus of this field trip are in the foothills of west-central Maine. One location contains several sites along Cape Cod Hill in the town of New Sharon. At its highest point, the hill stands approximately 890 ft (271m) asl, and the initial study site is at approximately 460 ft (140m) asl.

At the Chesterville location, the first site, is on the northern border of the town along Chesterville Hill between 350 and 480 ft (106-146m) asl. Chesterville Hill is a localized section of Old Bluff Hill/Blabon Hill. (Some publications refer to it as Chesterville Hill and some as Old Bluff Hill). The second Chesterville site is on the northeast flank of Zion Hill at approximately 380 feet asl, just west of Chesterville Hill. The third Chesterville site is between the Chesterville Hill and Zion Hill. The state of Maine bedrock geology map shows that all three hills are Devonian granite (Osberg et al.,1985) which appears as local outcroppings. Both locations are south of the Sandy River Valley, which changes course at Farmington Falls from a southeast flow upstream from the Falls, to a northeast flow downstream from the Falls (fig 1). It eventually empties into the Kennebec River at the town border between Starks and Norridgewock.

In addition to the value of the sediment itself for commercial purposes, many of these deposits are also important as a local groundwater supply. Groundwater is close to the surface and springs are visible at two of the locations. Besides their scientific importance, commercial uses, and groundwater potential, these mounded sediment deposits are a noticeable contrast to the topography of the adjacent hayfields and woods, and consequently, they are somewhat of a local curiosity.

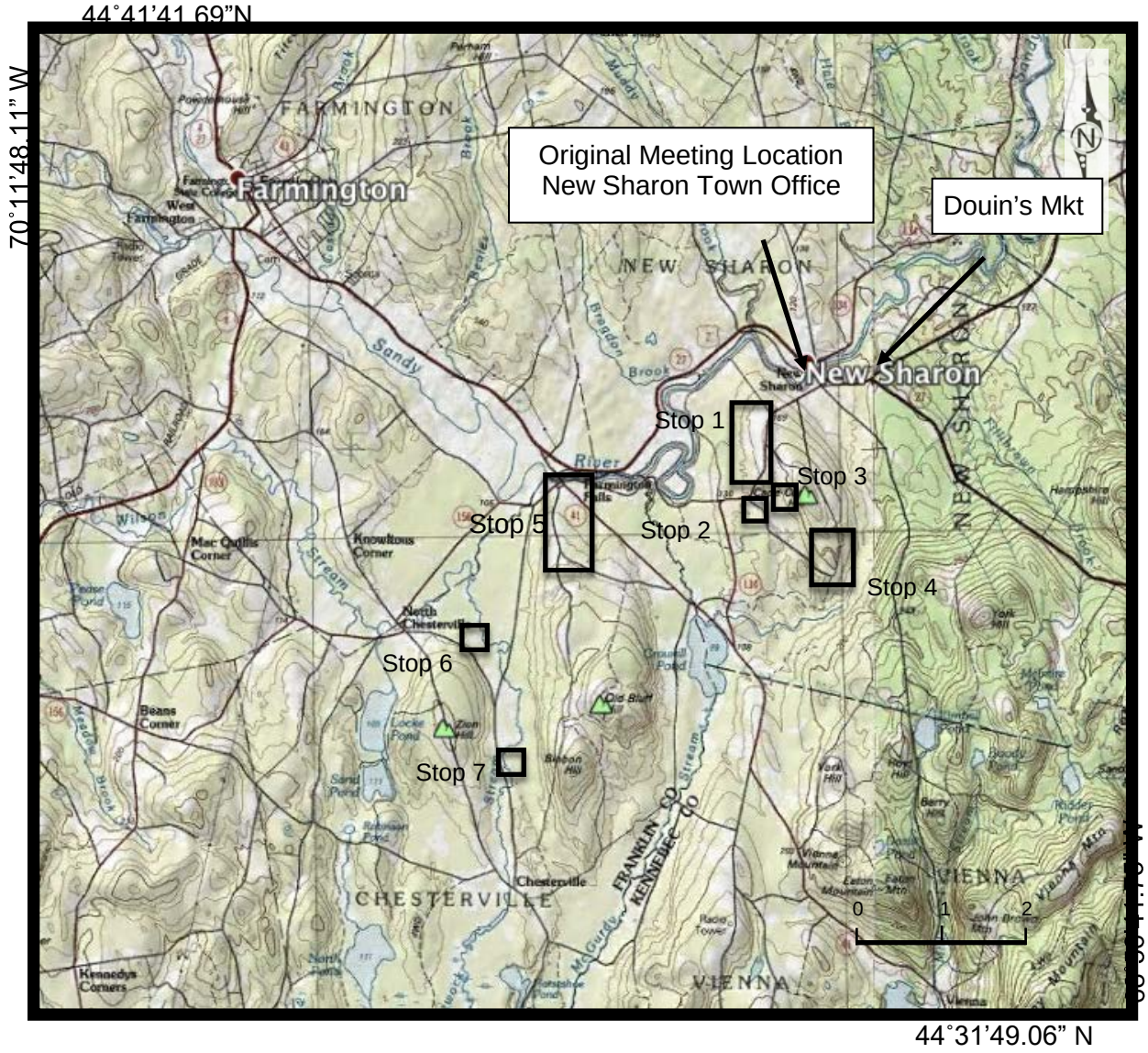

Figure 1: All of the field trip sites in New Sharon and Chesterville, ME (USGS, 1968)

PREVIOUS WORK ON SURFICIAL GEOLOGY IN NEW SHARON AND CHESTERVILLE, ME

Deglaciation in Central/Western Maine

Dorion (1997), Thompson (2001), and Retelle and Weddle (2001) date Laurentide deglaciation in central and western Maine between 13.5 kya, and 11.5 kya. Glacial retreat from Maine was primarily to the northwest, with recession of the thinning ice somewhat controlled by local topography (Jager, 1996; Thompson, 2001; Retelle and Weddle, 2001; Tary et al., 2001; Greve and Syverson, 2003). By 12.5 ka, eustatic sea level was well below its current position (at least 70 m or 230 ft)), but because of isostatic depression of the crust, the marine limit extended at least 132 m (433ft) in elevation from current sea level (Belknap et al., 1987), and resulted in the deposition of sediments that outline the extent of that marine limit (Thompson and Borns, 1985; Neil, 2007). Following this still-stand, rapid regression took place, and at approximately 11-10.5 ka, a relative sea-level lowstand occurred at -55 m (180ft) (Barnhardt et al., 1995). As rebound slowed to about the same rate as eustatic sea-level rise, various coastal

features were formed at that time, until eustatic rise subsequently became dominant (Belknap et al., 1987).

Glacial and Glacial Lacustrine Deposits

As one of the first modern researchers to study sediments specifically in the New Sharon/Chesterville area, Caldwell (1959) made many observations about sedimentary deposits there. Among these, he noted thick layers of till in the New Sharon gorge. Although he and other researchers do not necessarily agree with the timing of the till's deposition (Caldwell, 1959; Borns and Calkin, 1977; Caldwell, et al., 1985; Weddle and Caldwell, 1986; Weddle, 1989; Weddle, 1992; and Weddle et al., 2006), they do agree that many of the glacigenic sediments in the New Sharon section of the Sandy River Valley were ice-contact or ice proximal. Researchers have proposed that the entire sequence of sediments was deposited during the early Late Wisconsin (Weddle and Caldwell, 1986; Weddle et al.,1989; Weddle, 1992).(Weddle, 1992).

Deformation in the entire sequence occurred as glacial lobes from two different directions, the Kennebec Valley from the northeast and the Sandy River Valley from the northwest, oscillated during glacial advance (Weddle, 1992). These till deposits are potentially very important contributors to the formation of the deposits being studied because the advance of the Kennebec River Valley lobe was partially responsible for damming the Sandy River Valley, creating a pro-glacial lake there (Weddle, 1989, 1992).

As a result of the New Sharon dam, glacial lacustrine deposits can be found as a series of delta remnants in several tributary valleys near New Sharon and Chesterville. These tributaries were conduits through which sediment was transported and eventually graded to lake level. They can be found along with rhythmically bedded sediments composed of sand, silt, and clay (Weddle and Caldwell, 1986).

Glacial Marine Deposits

Belknap et al. (1987) also showed that by 12.5 ka, because of isostatic depression of the crust, the marine limit was at least 132 m (433ft) higher than the current sea level. For reference, the Sandy River between Chesterville and New Sharon is at approximately 320 feet (97m) asl (USGS, 1968). Jager (1996) discovered deposits of glacial marine clay at elevations of approximately 470 feet (143 m), as far north as Lexington Township (approximately 18 miles (30 km) north of New Sharon and Chesterville), These marine sediments are covered with braidplain deposits, deltaic sediments, and nearshore deposits (Jager, 1996) which indicate that alluvial processes took over following uplift and marine regression. Even though Jager's description is for the Carrabassett River Valley, not the Sandy River Valley, Neil (2007) mapped marine sediments in the Sandy River Valley as far north as the town of Strong at 470 feet asl (143m), approximately 15 miles (25 km) northwest of these study sites. Therefore it makes sense that the till dam in New Sharon was breached while in proximity to the ocean and local relative sea level reached elevations of 470 feet asl (143m) through the New Sharon gorge as well. This is especially likely if the highest outlet from the lake was only at 385 feet (117 m) asl (Weddle and Caldwell, 1986).

Eolian Deposits

Eolian deposits have been identified in various parts of Maine, and are abundant along the Kennebec River near Madison (McKeon, 1989). These dunes, described in detail by McKeon (1989), were identified as either longitudinal or wind-shadow deposits, and the dune axes of forty-seven of the sixty-four longitudinal dunes in McKeon's study are oriented with a strong a northwest/southeast trend. McKeon (1989) hypothesized that they formed along the Kennebec as the post-glacial isostatic uplift outpaced the eustatic rise in sea level. In this case, sediments coarser than the glacial-marine clay were first deposited, and then sandier sediments (Embden Formation) (Borns and Hagar, 1965) eventually transported and prograded onto, and interfingered with, fine sediments of the Presumpscot Formation, providing ample material for eolian transport processes McKeon, 1989).

The nature of eolian bedforms depends on both the availability of sand and the nature of the wind regime. Because longitudinal dunes commonly forming approximately parallel to wind direction and have two slip faces (or varying slip faces), this indicates a variation in prevailing winds. These contrast with transverse dunes which form perpendicular to the prevailing wind direction and have only a single slip face (Reffet, et al., 2010). These further contrast with parabolic style dunes which develop vegetated sections in isolated areas, and un-vegetated areas allow wind to scour parts of the dune causing its typical shape of up-wind "arms" (fig 4).

Thorson and Shile (1995) show that the northwest trend of parabolic dunes on the floor of Glacial Lake Hitchcock in western Masachusetts indicates a shift from anticyclonic wind patterns that were present over the Laurentide

ice sheet to predominantly cyclonic patterns (northwesterly wind) by the time the western New England lake drained. They speculate that this might have occurred at approximately 12.4 ka. Sediments in these conditions would have been mobile, especially before stabilization by vegetation. It makes sense that these conditions would have likely been present over Maine as well.

Because of the presence of both glacial-fluvial, lacustrine, and marine deposits in this area, and because the sediments would have been exposed upwind of the western slopes of both Cape Cod Hill and Chesterville Hill with a relatively long fetch along the Sandy River Valley, it is possible that the combination of abundant sediment and relatively steady wind was adequate to build dune ridges along the three hills (Millette, 2014).

Glacially Streamlined Features

Other mounded linear sediment features that are found in Maine also include drumlins and crag and tail features. Both are glacially streamlined features and occur during the advance of a glacier, generally by reshaping subglacial till deposits into elongated, more or less, tear-shaped deposits (Munro-Stasiuk et al., 2013). They differ in that the sediment tail of a crag and tail feature is positioned in the lee side of a more resistant bedrock protrusion, and drumlins often occur in large fields, such as the thousands of drumlins in the Finger Lakes area of New York State (Kerr, 2007), and in the lee of the Mt. Agamenticus uplands in Maine (Nelson, 2003).

INTERPRETATION OF NEW SHARON AND CHESTERVILLE DEPOSITS

Mounded sediment features along the western flank of Cape Cod Hill in New Sharon, and Chesterville Hill in Chesterville, Maine are most likely eolian coastal dunes, and the large streamlined feature at the southern end of Cape Cod Hill is likely a till-tail (crag and tail). During glacial advance, it progressed south over the top of Cape Cod Hill, scratching striations into the surface of the Devonian granite, and carrying englacial and subglacial till. As it crested the hill, it may have consolidated and then deposited till on the south side of the hill (fig 2). As it continued to the south, it streamlined parts of the till tail and possibly deformed its east/west profile by a somewhat asymmetrical shoving of the sediments (Millette, 2014).

During deglaciation, if the Sandy River ponded behind the till dam at New Sharon, and subsequent flooding from the ocean occurred when post-glacial sea levels rose above the dam, deltaic sediments from multiple feeder streams would have been deposited in large quantities into these low lying, somewhat protected floodwaters. Additionally, areas between the hills (then islands) would have been draped with marine sediments, such as is the case at

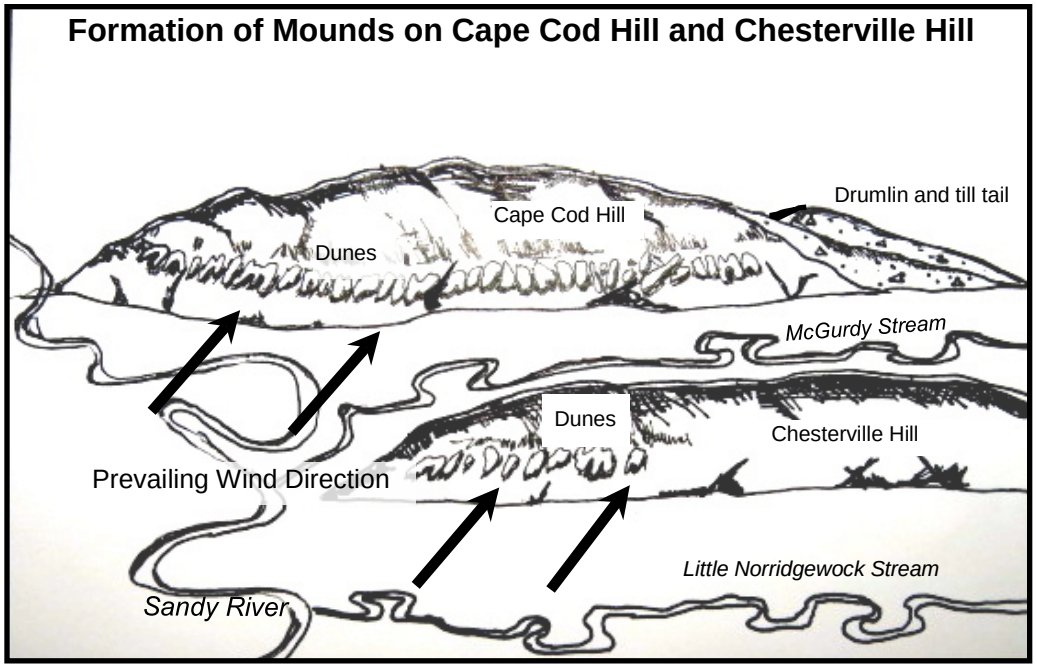

Figure 2: General Illustration of mound structures on Cape Cod Hill in New Sharon and Chesterville Hill, Chesterville. Includes dune, drumlin, and till tail formation. (modified from Millette, 2014)

the Lowell Cemetery (Luick and Millette, 2015).

Following the breach of the dam in New Sharon, the river would have returned to its normal course and left significant quantities of fine sediments vulnerable to the wind. With a strong prevailing wind from the northwest (Thorson and Shile, 1995) , these unprotected sediments would have been transported to the flanks of Cape Cod and Chesterville, and Zion Hills and deposited there when the strength of the wind could no longer carry them any farther up onto the side of the hill (fig 2). Possibly the wind had a more direct approach on Chesterville Hill, resulting in the sediments being carried to a higher elevation than on Cape Cod Hill. Because of this sustained northwest wind, sediment deposits would have been elongated into more or less linear forms with longer, less steep windward faces, and shorter, somewhat steeper leeward slip-faces (Millette, 2014).

Because of large scale changes in post-glacial climate, notably around 10 ka, and possibly between 13.5 ka and 12 .3 ka, vegetation changes were rapid (Jacobson, et al., 1987). Whole assemblages and abundance of specific vegetation were dramatically altered within each 2,000 year time frame, and between 14 and 12 ka, shorter (not trees) boreal vegetation types were abundant (Jacobson, et al., 1987). These smaller species of vegetation would have been available to partially stabilize some of these dunes, which may have facilitated the formation of parabolic blowouts on the upwind side. Eventually all of the dunes were stabilized and show vegetative communities unique to their drier, sandy, well-drained soils (White Pine, Red Oak , Eastern Hemlock, Sugar Maple, and White Ash) (Millette, 2014). In more recent historical times, the sand in these dunes has been excavated for local commercial purposes, and there is current local debate over their mining for commercial uses versus their protection as groundwater storage.

ACKNOWLEDGMENTS

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ROAD LOG

ORIGINAL MEETING PLACE, 419669.92m E 4943034.02m N: New Sharon Town Office, located on the corner of US Rte 2 and Cape Cod Hill Rd (formerly the New Sharon Elementary School) AT 8:30AM (fig 1). **Cumulative** mileage is given from the original meeting place, and indicates the **destination** at each leg of the trip.

0 miles	Turn right out of the Town Office Parking lot onto Cape Cod Hill Rd.
1.1 miles	Pull into the long driveway at 249 Cape Cod Hill Rd, between the house on the right, and carriage house on the left.

STOP 1: AEOLIAN DEPOSITS, (FIG 3), 418615.56M E 4941767.26M N.

With this spectacular view of the western mountains is the site of our initial mystery mound (fig 1). There are some excellent examples of longitudinal and parabolic dunes in this line of features down the west side of Cape Cod Hill, as well as an example of human use for the sediment in the mound in the lower pasture of this farm. Looking to the southwest, Chesterville Hill can be seen as the next ridge over, and sections of the Sandy River Valley are just visible to the northwest. Traveling south along Cape Cod Hill Rd, large parabolic dunes are seen across from the corner of the Dyer Brown Rd, as well as some simpler dunes. Parabolic-shaped features on the west ends of many of the features suggest that during their formation, the dunes were variably stabilized by vegetation (fig 4). The concave features on the east end of a few mounds may suggest that the dunes were non-vegetated long enough at those locations to form barchan-type “wings” on the lee side. Conversely, they may also indicate the removal of sediments

for domestic or commercial uses, as is documented for the first dune at this stop (Mills, pers.comm., 2008), and in sand pits currently being excavated on Chesterville Hill.

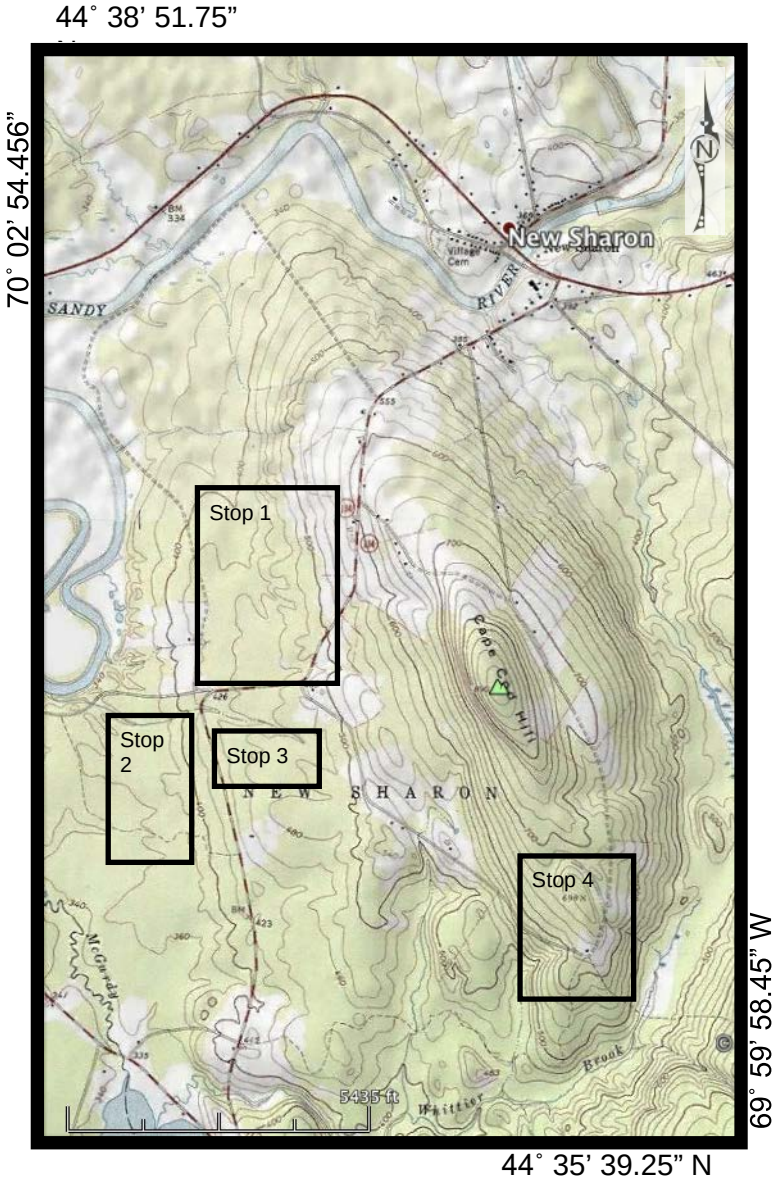

Figure 3: Location and topography of stops 1, 2, 3, and 4 (Map imagery from USGS, 1968)

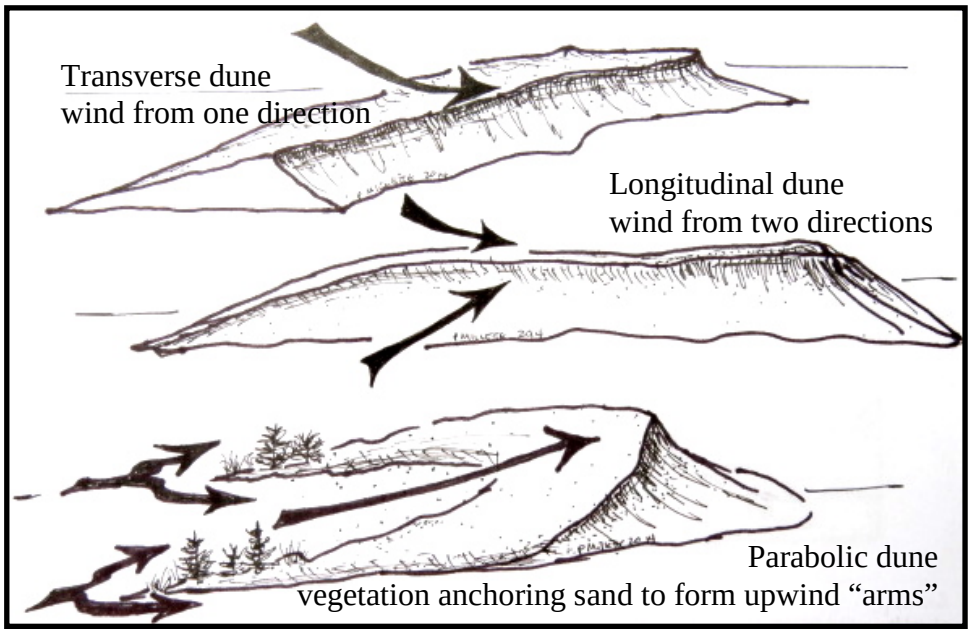

Figure 4: General Dune Types (modified from Millette, 2014)

A ground-penetrating radar trace of one of these dunes can be seen in fig 5. Internal reflectors of this feature tested with the GPR showed characteristics that are consistent with simple dune formation.

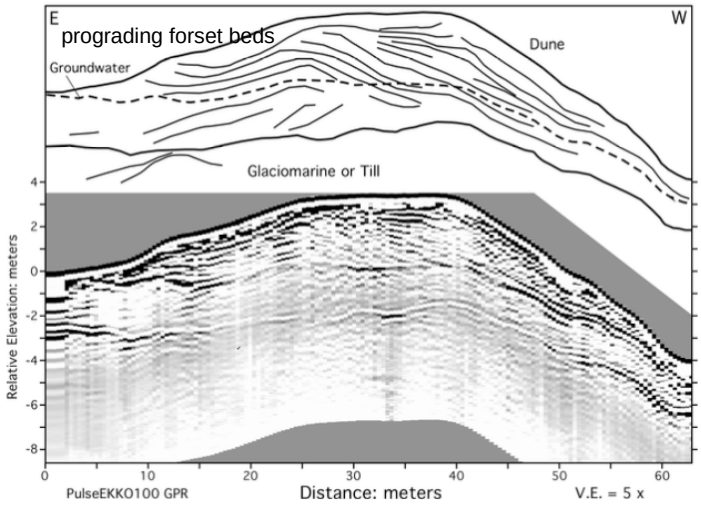

Figure 5: GPR trace of one of the Cape Cod Hill dunes (Millette, 2014)

1.7 miles From Stop 1, turn right (south) onto Cape Cod Hill Rd, and travel .6 miles.
Turn left (southeast) onto the Dyer Brown Rd, and pull off the road to the right in front of the first house after the corner.

STOP 2: LONGITUDINAL AND TRANSVERSE DUNES, 418353.09M E 4940824.04M N.

This location includes an excellent example of a large longitudinal dune oriented northwest to southeast (Shown as M-104 in fig 6). It is adjacent to another mound with a perpendicular orientation to most (Shown as M-103 in fig 6). It is an obvious exception and its orientation and successive profiles (fig 7) suggest that it is a transverse dune. Its location next to a very large longitudinal dune suggests the possibility that wind was funneled in primarily one direction alongside that larger dune, resulting in its transverse orientation.

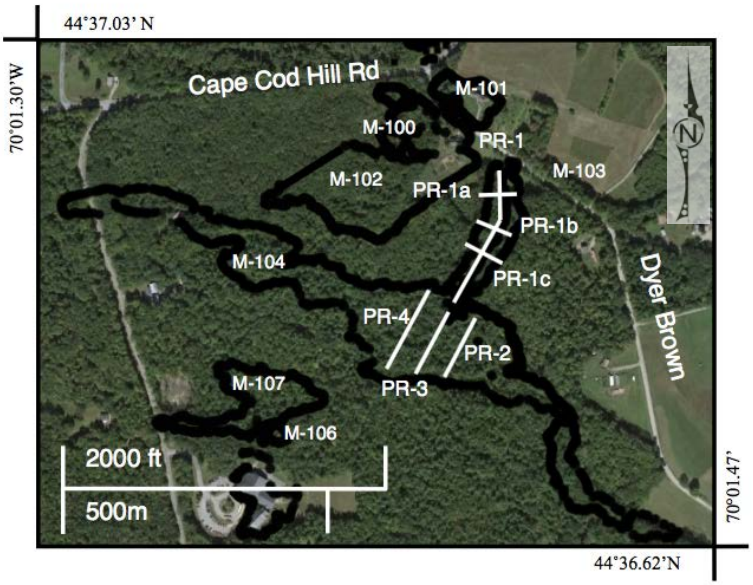

Figure 6: Dune locations north end of Dyer Brown Rd., Cape Cod Hill, New Sharon, (Base imagery Google Earth, 20113) (Millette, 2014)

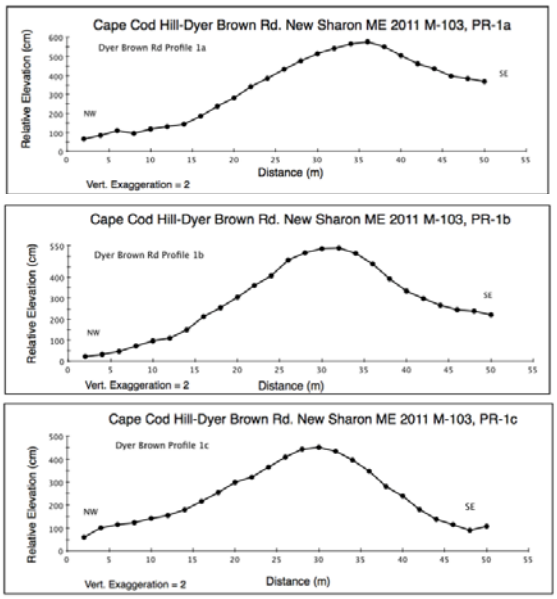

Figure 7: Cross-section profile of transverse dune M103 (Millette, 2014)

STOP 3: DEVONIAN GRANITE CENTER-CHIMNEY FOUNDATION, 418353.09M E 4940824.04M N: (across the Dyer Brown Rd. from stop 2).

Stop 3 does not include any specific sedimentary deposits, although the house here does sit on top of one of the simpler dunes. It is included to show local usage of the local Devonian granite that came from, according to the owners, a quarry on the Smith Rd (the eastern side of Cape Cod Hill). This house was built circa 1820 and has a wonderfully crafted chimney foundation made of Cape Cod Hill granite. The owners were generous in their offer of its viewing. It is a quick stop, but worth the look (also the owners have volunteered their bathroom and water supply as well).

3.1 miles From Stops 2&3, continue southeast 1.3 miles along the Dyer Brown Rd to its end. Park along the roadside at Stop 4.

Traveling towards the east end of Dyer Brown Rd, it becomes clear when sediment on the roadside starts to show cobbles and gravel. This is a harbinger of the next feature. Notice that we have gone southeast of the highest elevation of Cape Cod Hill at this point.

STOP 4: CRAG AND TAIL/DRUMLIN FEATURE, 419866.02M E 4939438.06M N.

Stop 4 marks the end of the Dyer Brown Rd, and its connection with the eastern end of the Smith Rd. (It is not recommended that anyone drive through to the Smith Rd from here). When compared to the dunes already seen on Cape Cod Hill, the large feature at the extreme southern end of the hill has a similar orientation, and an elongated shape, but its grain size distribution suggests an origin very different from all the other sediment features in the area and suggests that it is till. Its grain-size distribution, along with its streamlined shape, orientation parallel to striations on Cape Cod Hill (Thompson and Borns, 1985) and position on the south side of Cape Cod Hill, suggest it is a drumlin-like or a crag-and-tail feature, or more likely a combination of both (Millette, 2014).

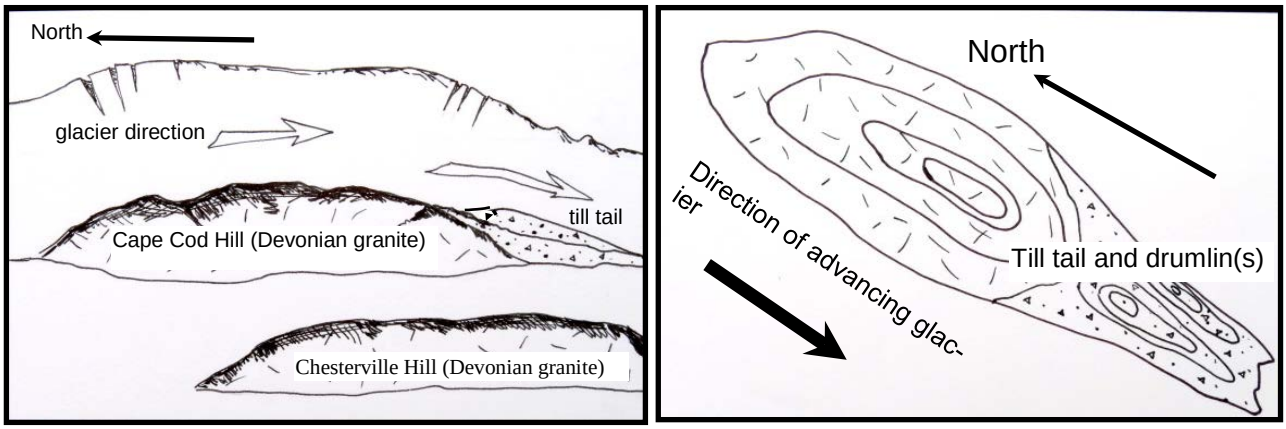

Figure 8: Generalized topographic view of till tail and drumlin deposition on Cape Cod Hill (modified from Millette, 2014).

4.5 miles	Turn around and drive 1.3 miles back to the junction of Dyer Brown Rd., and Cape Cod Hill Rd.
4.8 miles	Turn left at Cape Cod Hill Rd and travel west for .2 mi. Bear right onto the George Thomas Rd. across the (partially dirt) intervale. Along the way, notice the relatively flat terrain across the intervale.
5.6 miles	Notice an oxbow lake cut off from the Sandy River in the Flood of 1987 visible on the right.
5.9 miles	Take care crossing the narrow stone bridge over MvGurdy Stream. At the visible confluence of McGurdy Stream and the Sandy River are some excellent outcroppings of Presumpscot clay.
6.9 miles	Stop at the junction of George Thomas Rd and Rte 41. At the end of the George Thomas Rd., turn north briefly onto Rte 41).
7.2 miles	At the junction of Rtes 41 and 156, turn west onto Rte 156.
7.3 miles	Go approximately .1 mile and stop at the Morrill Homestead. It is the first house on the right-hand side of the road. Pull as far off the road as possible, since this is a busy section of the road.

STOP 5: ABANDONED WELLS, (414652.47m E 4941184.23m N) ADDITIONAL DUNES,(414627.71m E 4940358.80m N, and 414920.07m E 4939787.69m N) (FIG 9).

The first part of this stop is to locate the three abandoned water wells at the northern-most base of Chesterville Hill. Although the dunes on Chesterville Hill are designated as lower groundwater flow areas (less than 10gal/ minute) (Neil, 2000) they provide a contribution to the municipal supply for the village of Farmington Falls (Tolman, 1999). Notice the pump station for the Farmington Falls water company at the bottom of the hill. If time permits, a tour of the pump house by the former head of the water company is possible.

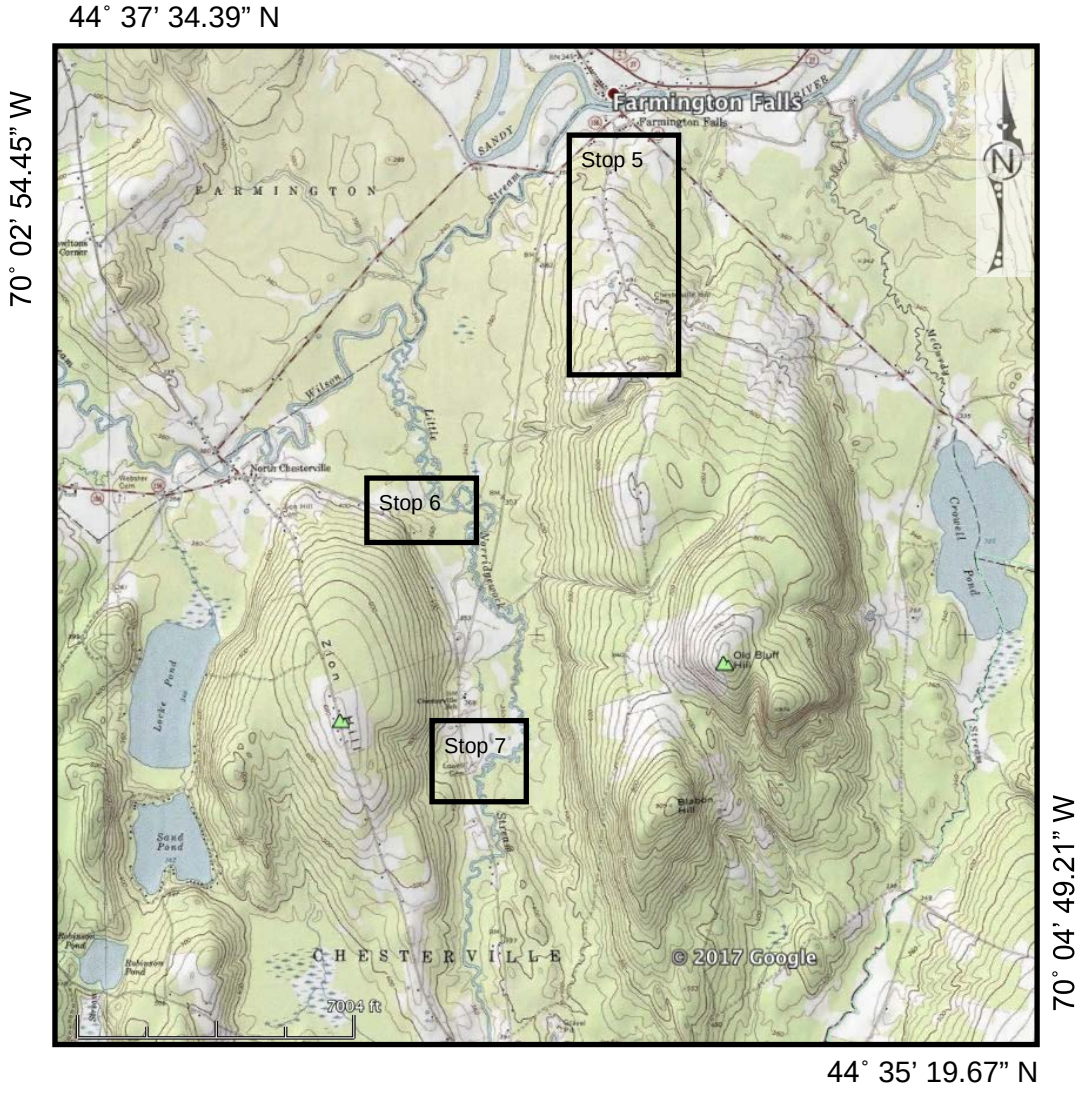

Figure 9: Location of stops 5, 6, and 7. (Imagery from USGS, 1968)

7.8 miles From the Morrill homestead, drive .5 miles to the Rogers/Fuller/Hagar properties, beginning at 110 Chesterville Hill. We will park here and walk into the woods and loop back around again to the vehicles.

At this location, a regular pattern of longitudinal dunes is apparent throughout the woods. The identification of additional dunes on the west side of Chesterville Hill signifies that dune formation in the area around the Sandy River Valley was not unique to Cape Cod Hill, and their origin was likely from similar conditions. Because of its placement where the Sandy River turns to the east, a long fetch was possible before hitting the north end of Chesterville Hill. This may help explain the relatively higher elevation dunes on the hill.

8.1 miles Drive .4 miles up Chesterville Hill to the junction of Chesterville Hill Rd., and the Stinchfield Hill Rd. At the fork, bear left onto Stinchfield Hill Rd. Although there a few more higher elevation dunes on the Chesterville Hill Rd. (520+ft asl. (Haslam et al, 2017), landowners there are sensitive to having groups of people on the property.

8.3 miles Go slightly past the first house/farm on the right and park along the Chesterville Hill Cemetery.

At the Farley Farm, there are obvious dunes seen around the house and surrounding horse paddocks, and at the Chesterville Hill Cemetery. Their elevation is just over 500 ft asl. (Millette et al., 2016a) This placement of the old cemetery underscores the ease in which deceased persons were buried in the dunes, since the sand here is extremely easy to move with only a shovel. (Feel free to talk to the horses and chickens here).

9.2 miles Turn around and travel back down the Chesterville Hill Rd to Rte 156.

11.8 miles Go west on Rte 156 for 3.5 mi, and stop at the stop-sign in N. Chesterville.

12 miles Turn south briefly on 156 and go across a small bridge to a 3-way intersection of 156, Zion Hill Rd, and Valley Rd.

12.7 miles At the intersection, bear left onto the Valley Rd. to Stop 6. Park carefully along the roadside at 181 Valley Rd.

STOP 6: VALLEY ROAD DUNE, 412884.33m E 4938179.07m N:

The placement of this significant dune on the northeast end of Zion Hill, (approximately 400 ft asl) suggests that it was formed by winds coming from more than one direction in the flatter terrain to the west of Chesterville Hill and to the north of Zion Hill, causing an elongated mound with a step crest on the southeastern end (Millette et al 2016b). A significant part of the dune is beneath the house, and has been modified somewhat (according to the landowners). However, the crest and dune ridge are fairly evident south of the house itself.

13.6 miles From Stop 6, continue south on the Valley Road .8 miles to the stop-sign at the intersection with the Pope Rd.

14.1 miles Continue onto the Pope Rd and drive south for .4 additional miles to the Lowell Cemetery.

STOP 7 LOWELL CEMETERY: GLACIAL MARINE SEDIMENTS DRAPED OVER AN UNKNOWN SUBSTRATE, 413488.19M E 4936243.88M N.

Like many of the others in the area, this mound's axis is oriented from west to east suggesting that the mound could also be aeolian. Additionally, the profiles show that the mound has a gradual slope on its northwest side and a very steep slope on the south and southeast side. Due to the prevailing northwesterly wind (Thorson and Schile, 1995), this also suggests that mound might be a longitudinal dune. However, the steepness of the southern side of the mound continues along the perimeter of the adjacent field and becomes the bank of the stream there.

Fine-grained sediment (sand and mud), and its location between Zion and Blazon Hill indicate that the mound is not aeolian. The shape of the mound could indicate that the mound is a landscape anomaly draped in glacial marine sediments. Evidence of this is found in the path of the adjacent stream. The steep southern side of the mound continues east and becomes the current stream bank. This indicates that the southern side of the mound is a former stream

bank and that the stream may have migrated. Furthermore, the path of the stream south of the mound runs parallel to the road in several places, which implies that the building of the road caused the stream to migrate. This suggests that stream might have previously flowed farther to the west (fig 10 and 11). More evidence of artificial stream migration is found farther upstream where the stream cuts across the road instead of following the contour line indicated in the topographic map (see fig.3). This contour line suggests that without any artificial stream migration, the stream would have moved along the south side of the mound and created a steep bank along some landscape anomaly (Luick and Millette, 2015).

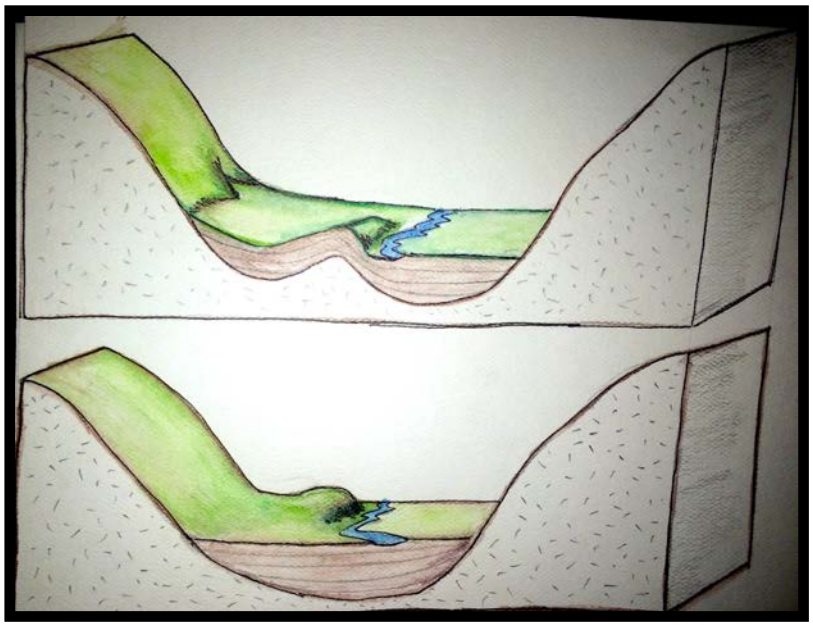

Figure 10: Illustration, interpretation showing sediment layers draped over granite pluton/till deposit irregularity at Lowell Cemetery (modified from Luick and Millette, 2015)

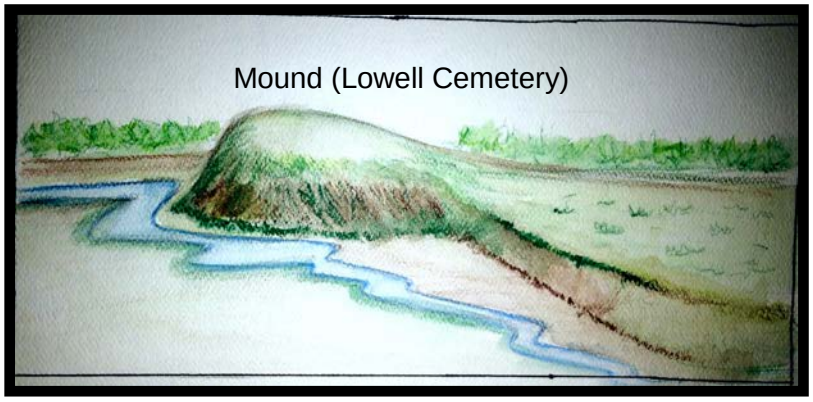

Figure 11: Illustration, interpretation showing adjacent stream creating steep bank at Lowell Cemetery (modified from Luick and Millette, 2015)

The origin of the underlying landscape anomaly is currently unknown. It could be a small granite pluton or a small irregularity in the surrounding granite plutons such as Zion and Blabon Hills. The mound could also be draped glacial till. The use of the mound as a graveyard supports that hypothesis (Luick and Millette, 2015).

16.9 miles	From this stop, drive north on the Pope Rd. back to Rte 156.
17.3 miles	Go east onto 156 to the Farmington Falls Bridge.
17.4 miles	Turn left and go north across the bridge, and then turn immediately east onto Philbrick St.
17.6 miles	At the end of Philbrick St., turn right (east) onto Rte 2/27
21.7 miles	Travel to New Sharon and cross the bridge over the Sandy River. Notice this bridge's height above the water compared to the Farmington Falls Bridge.
22.9 miles	Take a right onto Cape Cod Hill Rd. back to Stop 1 to retrieve cars.

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