

VENTIFACTS AS INDICATORS OF ANCIENT AND LOCALIZED
LONG-TERM WIND CURRENTS ON LONG ISLAND

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Long Island ventifacts, wind-polished stones in a matrix of glacial till, can be used as indicators of strong, steady wind currents. They can also be used as devices to predict sand deposits to their windward. Sand grains are the principal projectiles that do the weathering.

One can tell the difference between the sides of a ventifact facing the air compared to the portion in contact with the ground. The upper surfaces are smoother, polished and even fluted to indicate a prevailing wind current that did the sand blasting. The lower side is rougher with no polishing, faceting, or fluting.

While ascending the Ronkonkoma Moraine on foot trails, both in Suffolk County, I found exposed ventifacts which were imbedded in the ground and were undisturbed by human interference. These stones did not appear to have been dislodged by foot traffic or erosion. There were partially sunken in the till, their facets recognizable as I hiked along. Both locations were on the south-facing slope.

Location One in an undeveloped Town park in Brookhaven Town south of Breton Woods between County Road 83 and route 112 and Mooney Pond Road and Granny Road. I found six specimens partially exposed on an incline with a slope of about 35 degrees. The adjoining topsoil was elevated approximately four inches above the trail. Using a compass, I measured the direction perpendicular to each major face and converted it to a general direction such as north, northeast etc. I drew a sketch to show the angles of each face. Then I removed the specimen to examine the unexposed portion in contact with the till to confirm in situ conditions.

I found seven specimens at Location Number Two in the Town of Southampton. I also found these along a hiking trail in the David Sarnoff Pine Barrens Reserve. (see map). The conditions of stone burial were similar to location number one. I followed the same procedure.

The question arises as to whether these ventifacts were formed when the Wisconsin Glacier was stationary or in retreat some 16,000 years ago. I made the assumption that the position of these stones had not changed since then. If this is so, the velocity of winds that created these ventifacts would have had something to do with the presence of the glacier. Or were these stones faceted long after the glacier left and long-term wind episodes due to local climatic situations created? How long did these winds continue? How long did it take to create the facets on these stones? These were questions generated by the discovery.

I obtained an unpolished, rather angular piece of quartz about three inches long and one and a half inches wide and placed it in the center of an open, sandy swale on Fire Island at Smith's Point. I found the swale along the boardwalk just west of the Visitors Center to be a suitable location to do this experiment. I placed the rock in the center of an open sandy area and left it there for the months of September to March. I returned seven months later and located this same rock sample exactly where I had left it. The north-facing surface was the most wind polished. I was startled at the speed at which the weathering process took place. Based on what I observed, I made an estimate of how long it would take the wind to create the facets on the ventifacts I found at both locations. I estimate that winds in excess of twenty MPH blowing across the newly formed Ronkonkoma Moraine that had dried sufficiently to allow the saltation of sand grains would weather these stones to a depth of one inch in approximately one hundred years. Further experimentation is necessary to confirm this estimation.

I conclude that there was strong episode of steady winds in excess of 20 MPH blowing across Long Island for a period of 50 - 100 years etching these stones and probably many others recently buried under topsoil. On further explorations, I found at least fifty loose ventifacts along Portion Road in Ronkonkoma which I could not use here.

There are extensive sand dune deposits in the Selden Basin just north of Location One. This is most likely the source of the abrading material that created these faceted stones. Likewise, sand particles were lifted from the drying outwash plain north of Location Two to act as the abrading material to create those ventifacts.

OBSERVATIONS OF FACET DIRECTIONS

Location One: 4 out of 6 major facets face easterly.

Location Two: 5 out of 6 major facets face westerly.

DISCUSSION: From the study of the facet directions of thirteen ventifacts, five ventifacts had facets from location two facing in a westerly direction. The four ventifacts at location one had most of their facets facing an easterly direction. One possible reason for this difference in direction may be due to elevation. Location one is 300 feet above sea level and location two is from 120 - 180 feet above sea level. The wind may have been deflected more at location one by the morainal ridge. The location two ventifacts showed facets that were created by strong northwesterlies. We experience these prevailing winds today especially in the winter months. Without any vegetative cover or topsoil, saltation was widespread with winds coming from different directions at different times.

The discovery of more exposed in situ ventifacts and notation of the direction of their facets should confirm or refute these findings.