Projectile Points and Refitted Artifacts at the Sheguiandah Site: Their Position and Meaning

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Paleo-Indian projectile points from the Sheguiandah site on Manitoulin Island, Ontario, played an important role in dating the site, both in the original excavation in the 1950s and in a 1990s reinvestigation, but the conclusions of the two investigations were radically different. This divergence of opinion stems not from the classification of the artifacts, but from their positions in the ground. Originally, these specimens from a narrow temporal period were described as being restricted to a thin soil layer dividing the cultural material above it from that below. The occurrence of artifacts below the Paleo-Indian level had implications for their geological dating, which placed them earlier in time and, it was argued, in glacial till deposits. Reassessment of the provenance of those projectile points and of refitted artifact fragments in the 1990s, which pointed to substantial post-depositional mixing, changed the whole picture and opened the way for a new dating of the site as post-glacial. A review of that reassessment now shows that it was fundamentally flawed. The distributions of the refitted artifacts and projectile points tend to support the original interpretation that the sediments were both largely intact and had meaningful relationships.

Introduction

More than half a century has passed since archaeologist Thomas E. Lee directed interdisciplinary investigations at the Sheguiandah site on Manitoulin Island for the National Museum of Canada (Lee 1953, 1954a, 1955, 1956, 1957, 1979; Sanford 1957, 1971). The site has been controversial for much of that time because, after four years of excavation, Lee reported finding artifacts below a Paleo-Indian level, in a succession of glacial till deposits, and proposed an age of "a minimum of 30,000 years." Even today the issue of pre-Clovis people in the Americas is a contentious one.

Although the pre-Clovis dating of the Sheguiandah site was largely based on geology, the geological interpretations relied in part on Lee's identification of two distinct cultures in the deposits that appeared to be till (Sanford 1957:139). These in turn lay directly below a buried soil layer that had yielded Paleo-Indian projectile points. Lee went so far as to say that, had he not been able to discern the association between the points and that soil horizon, representing a time-specific break between the cultures above and below, the identity of the more deeply buried artifacts would have presented a puzzle almost incapable of solution (in Lee 2002:60).

After a time lapse of nearly 40 years, the Sheguiandah site was briefly reopened in 1991. Under the auspices of Archaeological Services Inc., Patrick Julig and Peter Storck directed excavations and brought in a new interdisciplinary team (Julig and Storck 1992; Julig and Mahaney 2002; Storck 2002, 2004). After four weeks of excavation, the controversy was resolved to the apparent satisfaction of the investigators. It was concluded that the supposed glacial deposits were instead post-glacial and the artifacts in them, entirely

post-Clovis. The controversial tills were reinterpreted as a beach deposit formed by the Korah phase of glacial Lake Algonquin, which, as it fell, exposed the site to occupation about 10,000 years ago (Barnett 1992, 2002; Anderson and Lewis 2002).

These new conclusions were reached without reference to the projectile point layer that had been so critical to Lee's understanding of the site. It had ceased to exist in the minds of the new investigators. Storck (2002) had shown, and Julig (2002:300) accepted, that the points were dispersed through several different strata.

Deeply buried artifacts were now believed to have become mixed downward from the surface by post-depositional processes, as evidenced by the separation of fragments that could be refitted (Julig and Mahaney 2002:117).

The 1991 excavations, however, were of such limited extent (c. 2 m^2 of new ground in the Habitation Area vs. Lee's 100 m^2) that they apparently produced no new projectile points or conjoinable artifacts that could be brought to bear on the problem (Julig et al. 1994:250). Instead, archaeological reinterpretation relied on the reanalysis of Lee's collections.

Storck (2002:140) undertook to produce a compendium of the site's projectile points, directly examining more than half of the specimens but drawing on the illustrations and information in Lee's published reports for the rest. Julig examined Lee's entire collection, selected samples for further work, and obtained relevant context data from the catalogue (Julig and Mahaney 2002:109, 117). Both referred to deficiencies in Lee's catalogue and specifically an absence of provenance data for points although Storck (2002:149) stated that such data was perhaps "not as yet found in the catalogue and notes". It can be hard, of course, to delve into the minute details of another worker's material—I have found it so, too—but with Sheguiandah one can definitely go further than was done in the reinvestigation. Notably, the catalogue was not the primary location for data entry. Lee recorded depth and context on the artifact itself and on outline sketches of the artifacts, in the daily field notes, in his photo catalogue, and sometimes when mapping the excavation units. Most of these are still extant and available in the Canadian Museum of History (formerly "of Civilization" [CMC]) archives, and I consulted these records in re-evaluating the assertions made.

The Stratigraphic Sequence in the Habitation Area

> What is Sheguiandah? It is first and foremost a *stratified* site […] [Lee 1974:24].

The site was originally defined as occupying the upper 10 hectares of a quartzite knoll. Artifacts and human-made flakes were found in a variety of depositional environments, including in human-made quarry heaps and in peat bogs, and even under a 4 ton glacial erratic. The scope of this paper, however, is restricted to excavations that took place in superficially normal forest soil on a small, sheltered part of the site—about 0.2 ha—that Lee named the Habitation Area.

The sediments there have usually been discussed under names that reflect particular geological interpretations. Here I seek to present them, as far as possible, in a purely descriptive manner. Some terms appear, however, that have dual meanings. One of them is the word *gravel*, by which Lee meant rock fragments the size of the stones used on roads and in making concrete. He soon dropped this term after being advised that, to geologists, *gravel* implied sorting, which was inappropriate for what they were talking about (till). And that is indeed the sense in which Barnett (2002:167) uses it when referring to both a "sand and granule gravel" (deposits "c & d" below) and a "boulder and cobble gravel" (deposit "e" below).

Julig and Storck (1992) and Julig and Mahaney (2002) also attempted to apply neutral terms, but introduced confusion by labelling the strata with the same roman numerals that Lee had used differently and specifically for *cultural* levels. Lee's cultural Level I, however, was exclusively surface material and did not correspond to a stratum. As a result,the numbered stratigraphic levels of these later authors are one out of step with Lee's cultural levels. Thus, Lee's cultural Level II

occurs in what Julig and his coauthors call stratigraphic Level I, Lee's Level III occurs in their Level II, and so on. Even the authors of this designation at times seem to conflate the two schemes: Storck (2002:143) explained Lee's projectile point–producing "transition" (see "b" below) as "a zone between Levels II and III," while Julig and Mahaney (2002:118) wrote of "the projectile points spanning levels II and III, not only in Level III, as reported by Lee." To Lee the projectile points *were* Level III, a cultural element; they were not *in* it.

Not wanting to perpetuate confusion, I will use the letters a–k, as used by Lee in his original labelling of the strata (1957:128-129).

(a) The Humus

The geologist Sanford (1957:142) observed, "A few inches at the surface are dark colored from the presence of leaf mold [...] and below this a thin horizon has a reddish brown coloration due to weathering and oxidation. Nothing of this character has developed below the projectile point horizon or at any lower horizon." There was an abundance of artifacts, chippings, and quarry debris that was about equal in volume to the soil itself (Lee 1957:117).

(b) "Transitional"

A thin layer of fine, buff to yellowish soil marked the transition from the blackish humus above to the body of reddish sediments below (Lee 1957:117; 1972:28).

Paleo-Indian and Archaic projectile points were associated with this sediment. In the first year of excavation, they were found at depths of "between 5 and 6 inches" (Lee 1954a:103). These items and this "Transitional" sediment were found "closer to the surface" (2–3.5 inches) in the second year (Lee 1955:65) and deeper ("6–7 inches") in the third year (Lee 1957:128). Sanford (1957:142) thought that the evidence "points strongly to the existence of an old surface at the time the projectile points were accumulating." Humus apparently did not form for the first thousand years or so. Lee (1972:28) suggested that, with its powdery feel, the sediment may well represent wind-blown material from the freshly exposed sediments on the suddenly dry bottom of glacial Lake Algonquin.

The reinvestigation team did not see this stratum, or comment on it. Barnett, however, thought that there could have been wind-blown soil, or loess, here, which "may also have been incorporated into the upper part" of Lee's controversial tills (2002:174).

(c & d) The Controversial Sediments

Lee expected the cultural sequence to end when he got into the usually sterile subsoil. Instead, for another 45 cm, quartzite artifacts and flakes kept turning up "in haphazard fashion throughout a deposit […] made up of clay, sand, gravel, pebbles, and boulders." "The sands and gravels became coarser with increasing depth," while numerous boulders 30 to 60 cm in diameter appeared more frequently (Lee 1954a:104; 1955:70).

These deposits are at the heart of the controversy at Sheguiandah, for at the end of the first season, Sanford (in Lee 1954a:106) visited the site and told Lee that they appeared to be glacial till. "It is a heterogeneous mixture of material ranging from clay to boulders. It is not sorted except for the occasional sandy patches which are sometimes associated with till" (Sanford 1957:141). Some of the stones were foreign, meaning they had been brought from distant regions by glacial transport, while others were quite local, showing that they had been picked up and moved only a short distance—an important element in the picture, if possibly preglacial artifacts were going to survive.

Three more field seasons followed, each one probing the geological nature of the deposit and the site as a whole in more depth. Lee (1979:88) collected glacially faceted and striated pebbles, and he reported the discovery of clast fabrics (the tendency of elongated rock fragments within glacially deposited material to preserve an alignment produced by the stresses of glacial movement) (Figure1).

Technological differences in the artifacts led to the recognition, in the field, that there were two parts to the deposit. The lower half was further distinguished by, among other things, its more numerous rounded sandy inclusions, up to 15 cm

across, and the occurrence of lenses of sand up to 45 cm across. The lenses were interpreted as the remnants of lumps of sand that, having been ripped out of a pre-existing frozen deposit, thawed and became smeared out by continued glacial movement.

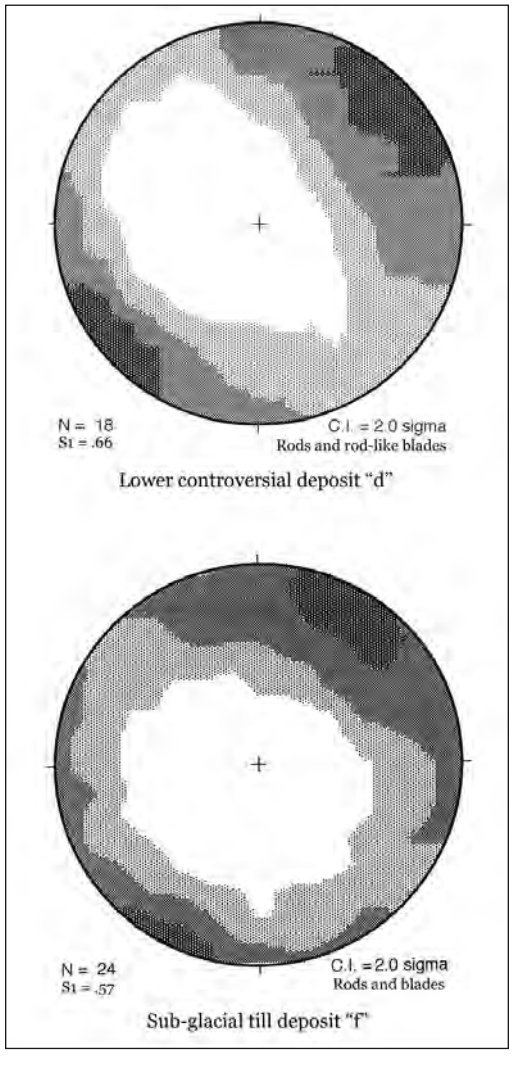

Figure 1. *Bimodal clast fabric diagrams for the lower part of Lee's controversial till (deposit "d") and Barnett's subglacial till (deposit "f"). These diagrams, which are computer-generated, graphically portray the statistical tendency of elongated stones to line up with the forces in effect when they were deposited. In this case, both are aligned NE–SW.*

Reinvestigation in 1991 produced somewhat different descriptions. To begin with, contrary to Sanford's view, the whole of the controversial deposits were considered to lie within the weathering zone. According to Julig and Mahaney (1992:51), "Between 10 and 50 cm depth, two oxidized B soil horizons were identified." The upper "is a sandy loam with abundant pebbles, and the lower […] is a coarser sandy loam, with less clay and stringers of granules." Barnett (1992:80), however, wrote of "a coarsening upward sequence […] a coarse to very coarse sand and granule gravel." Cobbles he considered "rare," and boulders were not seen by him. The 1991 exposures were evidently too small to reveal the full range of sediment sizes. The sand lenses, seen only in profile, were perceived as "stringers," with no relation to the rounded balls of sand, which were not seen at all.

Classically, tills and beaches are at the opposite ends of the sorting spectrum. Much of a till is typically made up of grains two microns or smaller (clay) and silt, while the largest are boulders a metre or more across, giving a size range of a millionfold. "Till is thus the poorest sorted of all sediments" (Pettijohn 1975:173). "The best-sorted sands," on the other hand, "are formed in the beach environment" (Burbidge and Rust 1986:17). The perfect normal distribution of grain sizes that is typical of glacial till will plot as a straight line on semilog graph paper.

Julig analyzed Lee's soil samples preserved from the 1950s and plotted the distribution of the finer grain sizes. "Most of the sediment samples between the surface and a depth of about 60 cm in the Habitation Area […] exhibit fairly linear grain-size curves, indicating they are not sorted" (Julig et al. 1994:241). Four samples from the controversial sediments in Stations 7-3, 7-4, and 7-8 averaged 52% sand, 31% silt, and 17% clay.

Barnett (1992:81) collected his own samples (8-B-3 and 8-B-4) from a test pit 15 m east of the others. It is believed that they represent the same controversial deposits. These samples averaged 76% sand and only 17.5% silt and 6.5% clay. The associated grain-size curves deviated strongly from the straight-line ("linear") curves obtained by Julig and Mahaney. "Similarities in grain-size

distributions between off-site samples of weathered beach sediment [… and] till 1 and till 2 of Lee […] lead to the interpretation that the upper units at Sheguiandah are weathered, oxidized nearshore or beach deposits of a post-glacial lake, not till […]" (Barnett 2002:175). The elevation, 214 m, led him to suggest the Korah phase of glacial Lake Algonquin.

Even after 10,000 years, sand grains from the Wisconsin glaciation should, under microscopic examination, show fresh glacial crushing and abrasion. None did. Instead, the grains "exhibited old fractures and well-weathered surfaces, indicating that the grains were derived from older deposits" (Julig and Mahaney 2002:109). Crescentic gouges and deep-furrow features, the result of transport by glacial ice, were observed, but "also exhibit weathering effects, mainly as dissolution etching."

Repeating Lee's pebble-orientation studies, and using, as far as I could see on the spot, the same methods as Lee, Julig and Storck (1992:57) found a weak bipolar fabric in their Station 7-8 test pit. This was close to Station 7-12, where, as noted above, Lee had found such fabrics.

(e) Water-Sorted Sands in a Boulder Concentration

Toward the bottom of the controversial deposits in stations 7-8 and 7-9, a layer of boulders began to appear. These were up to 30 inches (75 cm) across. Lee (1957) said they "completely pave large parts of the habitation area at about 30 inches' depth." A layer of sand on and between the boulders yielded a few artifacts and flakes.

Julig (2002:126) described here "coarse sands and boulder pavement," while Barnett (2002:167, 172) spoke of "boulder-sized rock fragments in a fine to medium-grained sand matrix" and a "boulder and cobble gravel with medium sand matrix."

Barnett then gave several reasons why these boulders were unlikely to have had a subglacial origin, such as the term "pavement" would imply. He outlined other means by which they might have been deposited from the ice, subsequently being eroded out by glaciolacustrine or possibly glaciofluvial processes. The former would indicate a post-glacial beach environment; the latter, meltwater coming through or out of glacial ice.

(f–h and i–k) Probable Subglacial Till

Below the boulders and sand lay up to 1.5 m of other deposits. Lee (1957:118) called them grey silty clays, which (in their upper parts only) produced some artifacts. Sanford (1957) described a complete section to bedrock 8 feet (2.2 m) down and, noting a gradation from layered material at the very bottom (i-k) into the more massive clay above, called the whole a lake deposit with glacial influences.

Barnett (2002:165) saw only incomplete sections in stations 7-8 and 7-9 (1.3 m deep [Julig and Storck 1992:51]) and so did not have the opportunity here to see the laminated bottom sediments that influenced Sanford. He described what was accessible to him as "silty sand with pebbles, cobbles and boulders." It was 49% sand, 35% silt, and 16% clay. Barnett interpreted this, at last, as subglacial till. There is evidence in Lee's work—oriented pebbles forming a fabric (see Figure 1)—to support Barnett's interpretation.

At 8 feet (2.4 m) the whole sequence was underlain by glacially polished quartzite bedrock.

Other Test Pits

Lee dug six supplementary trenches in the Habitation Area (see map in Lee 2002:52). Most were archaeologically comparable, but only Station 8-B, on the start of a downhill slope 15 m to the east, is relevant here. It seemed to have the controversial deposits (c & d) and the lowermost, laminated sediments (i–k) overlying bedrock at 1.1 m. However, the sorted sands and boulders (e) and Barnett's subglacial till (f–h) were missing.

Summary

That, then, is the stratigraphic picture developed during two periods of excavation nearly 40 years apart: a succession of sediments readily visible and verifiable in the profiles. As Julig and Mahaney (2002:133) note, "In our own work we observed, and can independently confirm most aspects of the stratigraphy he [Lee] described." All agree that there are glacial sediments, but precisely which they are, and how they relate to the artifacts, is disputed.

There was, however, another, earlier picture of the Sheguiandah stratigraphy, and it was quite different. It contributed mainly confusion, which, long forgotten, has now come back to haunt us.

In the first year of excavation, "careful examination of the trench profiles revealed no clear-cut stratigraphy, unless we may count the rather irregular lower line of dark humus [...] we are forced to rely more upon superposition and to this end we must exercise great care in noting depths and indications of subsequent disturbance" (Lee 1954a:106). It hardly sounds like the same site, yet this, too, is the Habitation Area.

Lee's excavation units, 10 feet (3 m) square, were numbered sequentially as they were opened. In Station 7-1, "general appearances indicated tree disturbances. When broken 'bifaces' were fitted together, evidence of such disturbance to a depth of 7 inches [17.5 cm] was provided" (Lee 1955:63). A notched projectile point found 25 cm below the surface in association with a little charcoal was judged to be "almost certainly at the bottom of a shallow pit." In Station 7-2, Lee (1955:64) found that "very heavy concentrations of quartzite chips and blocks persisted from the surface to 10 inches [25 cm]."

Such concentrations of chips were followed downward, level by level. In the south half of Station 7-4, human-made flakes and bifaces continued to a depth of 68 cm, sometimes occurring in concentrations. "[O]ne particularly interesting nest of charcoal was found, from 16 to 25 inches [40–63 cm], in an irregular patch about 6 inches [15 cm] in diameter" and "flakes of quartzite occurred throughout the charcoal area and the immediately adjacent gravels: the charcoal evidently was part of a pit" (Lee 1954a:104-106). Two non-matching biface fragments, catalogued as # 598, were found here at 26 inches (66 cm).

"The apparent presence of pits […] demanded further attention. Beginning at depths of 13 inches [33 cm] in St. 7-5 and at 10 inches [25 cm] in St. 7-3, the position of every flake of quartzite was plotted, for each 2 inches [5 cm] of depth. The superimposed plans leave no doubt whatever that the chip concentrations were in pits, although not the slightest trace of an outline could be seen" (Lee 1954a:103-106). In Station 7-5, on the south profile, "both soil color and chips indicated that a large pit […] had been filled with debris."

Station 7-6 was a bedrock outcrop, not excavated. In Station 7-7, "some evidence of a little disturbance to the 9-inch [23 cm] level was provided by the fitting of artifacts, but little proof of pits was obtained" (Lee 1955:65). In Station7-8, "patches of subsoil near the surface, together with a few specimens normally found between 6 and 9 inches [15 and 23 cm], gave clear indication of considerable tree-fall disturbance. The fitting of parts of artifacts shows disturbance to a depth of 8 inches [20 cm], while 2 shallow pits continued to about 12 inches [30.5 cm], as shown by chip concentrations."

Yet all this disturbance, all this initial confusion, existed side by side in the same trenches with occasional evidence for stratigraphic stability. While some refitted artifacts showed considerable vertical separation, others, notably broken projectile points (and the parts of a drill), were found at the same levels, typically in the Transitional sediment. That gave Lee reason to hope. In the third season, Lee's crews opened Station 7-9. From that point on, pits and tree falls were largely left behind. They continued to seek evidence of disturbance, and while there were still a few shallow pits and rodent burrows, Lee regarded them as "minor" factors. The new situation allowed a recognizable stratigraphic picture to develop—a picture that could be related to the cultural artifacts.

Cultural Stratigraphy

> What is Sheguiandah? It is first and foremost a *stratified* site, ranging through several discrete cultures […] [Lee 1974:24].

Once the geological strata at the site were better delineated, Lee (1974) was able to tie the geology to a suggested cultural sequence, as outlined in the following.

Cultural Level I

"At the surface is Point Peninsula, represented by no more than three or four specimens" (Lee 1974:24).

Cultural Level II

A "biface culture, using core tools made with percussion methods" (Lee 1974:24).

The humus, as noted above, was dominated by quartzite artifacts and chippings. The most characteristic elements were very large, ovate bifaces (called "blades" in the early reports). "Sizes range from about 3 inches to 10 inches long [7.5 to 25.5 cm], one inch to 6 inches wide [2.5 to 15 cm], ¼ inch to 2 inches thick [0.6 to 5 cm]. An average length is about 5 ½ inches [14 cm]" (Lee 1954a:108). These artifacts related the Habitation Area materials to surface finds over the whole site, from the top of the hill down to (but not below) a wave-cut notch in the hillside. That lower limit, at the shoreline of Great Lakes Nipissing, ca. 5000 B.P., coupled with the discovery of the nearby Giant Site at the same elevation, dated the site as it was first known (Lee 1954a:111; 1954b).

The large bifaces had been produced by extensive quarrying over the higher reaches of the hill. Lee (1954a:108) collected about 4000 in the first year. Most showed only primary flaking. It was taken for granted that they were "blanks" to be carried away and away for reworking into tools, especially projectile points. In this, Julig and Mahaney (2002:112) apparently concur. After going through Lee's collections Julig concluded that "most of the bifaces examined are preforms [….]"

Lee, however, had early and emphatically abandoned this interpretation. The quartzite had not been taken away from the site. Then, too, "there is the question of whether the objects found represent finished tools or merely blanks [….] There are indications that should not be ignored: many of the blades, including the largest, show definite edge wear, attributable only to use, in our opinion" (Lee 1954a:110). "Where signs of use are apparent, such signs are usually at or near the rounded base […] in many cases, the chipping has been more carefully done near the base" (Lee 1954a: 108).

The numbers of broken bifaces, snapped across the middle, also seemed extraordinary: "Broken specimens are available in terms of thousands, but they seem to be only parts of big blades, neither smaller nor better" (Lee 1954a:110).

Unifaces and small tools not derived from bifaces, suitable for cutting and scraping, were common, and are illustrated in Lee (1955: Figures 31–33; 1964: Figures 1 and 3). Not all were small; some scrapers were up to 22.5 cm long (Lee 1954a:108).

Lee (1964:22) also wrote, "It is my growing conviction that many of the thicker 'primary flaked bifaces' […] are nothing more than large cores which assumed the general shape of 'blades.' They were discarded, despite their large size, because they could no longer produce the very large flakes desired." Together with the cores, the masses of flakes and chips (1200–2400 per m^2 [Lee 1979:87; Lee 2002:46]) "demonstrate the strong interest of the workers in flakes, both large and small."

Lee stated, "It is becoming evident that some tremendous activity was in progress at Sheguiandah, other than quarrying" (Lee 1964:22). It took the suggestion of a geologist with experience on big quarry sites in the United States to tie all these threads of observation together. Bryan (1950:13, 33) proposed that the product exported from such sites was not stone, but wood.

We, today, obtain high-quality wood not from branches, but from the trunk of the tree. As T. Lee explained it to me, many of the Sheguiandah bifaces were probably wedges used to split otherwise inaccessible logs. The pointed ends, inserted into a widening crack, would be untouched, while, as observed, the rounded bases would become worn, even battered. Under sustained pounding, breakage across the middle would be common. The abundant small tools and the flakes, many of which showed edge wear, would have been used in shaping and smoothing the lengths of split-out wood at the workshop.

Stone tools and whole trees are normally too heavy to bring together, but I would suggest that wind and water would have carried fresh driftwood to the Sheguiandah quarries every year, as long as Great Lakes Nipissing lasted (perhaps a thousand years). The finished wooden products

would be of high value in the aboriginal world, light enough for easy transport and trade, and completely perishable in the archaeological record.

Cultural Level III

"A projectile point zone" (Lee 1974:24).

Typically, each 10 ft square produced one or two projectile points, for a total of 28 to 38 (depending on who has defined and counted them). Many were lanceolate forms, with tips diamond-shaped in cross-section; some had delicate "ears" at the base. Discussing these individually, Lee (1957:121) noted resemblances to types, such as "Angostura" and "Plainview"—even "Folsomoid." Others he considered early Archaic and Laurentian.

Storck (2002) classified most of Lee's points as Late Paleo-Indian (Plano). He, too, described them individually, and considered specimens with squared stems comparable to "Eden," "Scottsbluff," and "Alberta" points. Most, he noted, were made from quartzite. Five side-notched points were tentatively classified as Plano/Early Archaic. Only one of these was made from quartzite; the rest were made from chert or other material. Another five specimens from the excavation were classified by Storck (2002:149) as post-Plano. They exhibited either side-notching (small, V-shaped notches close to the base) or corner-notching, or were stemmed, with small, triangular blades. He found the cultural affiliation of the two corner-notched points, with flaking reminiscent of a Late Paleo-Indian pattern, "enigmatic." Lee (1957:121) said these had Laurentian characteristics.

Looking at the projectile point assemblage as a whole, Lee (1957:117) felt that they were probably of considerably different ages. The Paleo-Indian points "were rarely duplicated among themselves," and the variety suggested that a succession of peoples had passed through the site (Lee 1972:28). Yet, in his experience, they were mostly associated with a very thin stratum—the Transitional soil that Sanford (1971:12) regarded as a "collection surface."

Reassessing this matter many years later, Storck (2002:151) brought all the information he could find together for comparison. He concluded that "the provenience data in [my] Table 5.1, however, casts doubt on Lee's distinction between Levels II and III." We will return to this subject shortly.

Cultural Level IV

"Large thin bifaces […] made from large flakes" rather than cores or blanks (Lee 1957:122).

This material was found in the upper half of the controversial deposits (sediment "c" above). The bifaces were sometimes as long and wide as the average of Cultural Level II (14 cm long), but much thinner (1 cm). Many retained some portion of a large bulb of percussion at one end. "Secondary chipping is prominent" (Lee 1957:122). A few cutting and scraping tools were also found in Cultural Level IV. There were no projectile points.

Julig and Mahaney (2002:110) appear to consider these "upper level bifaces" to be late-stage performs that had worked their way down from the surface.

Cultural Level V

"[…] biface culture using primary percussion flaking" (Lee 1974:24).

The few bifaces in the lower half of the controversial sediments (deposit "d") were small (not more than 9 cm long) and thick. There were also some flake scrapers.

Lee contrasted the large, thin bifaces of Level IV with both the large, thick ones of Level II and the small, thick ones of Level V. When it came to analyzing them, however, Julig and Mahaney (2002:110) chose to compare the small, thick Level V bifaces with a combined sample from the upper levels (II–IV, a suite dominated by the large, thick bifaces of Level II). Their measurements of thickness and their width-to-thickness ratios were sufficient to suggest that "Lee may be correct in his statement about differences in biface morphology." They did not comment on Lee's observations of primary vs. secondary flaking, nor of flake tools vs. core tools.

Cultural Level VI

"[…] represented by one biface and many flake tools, embedded in sorted meltwater deposits" (Lee 1974:24).

These sorted deposits were the sands that lay among the boulder layer (sediment "e" above). There wasn't enough to warrant a cultural designation, but given the geological interpretation of a distinct deposit under glacial tills, it perhaps seemed likely to belong to a different age, and hence culture.

Cultural Level VII

"[…] bifaces […] beneath a boulder paving" (Lee 1974:24).

Lee (1957:128) reported here a single broken biface, several battered objects believed to have been bifaces, and flakes believed to have been made by humans. Contrary to what Julig and Mahaney (2002:122) indicated in their summary of Lee's cultural stratigraphy, these materials were not contained in the sorted sands and boulder layer (deposit "e"), but instead were contained below them, at depths of 70 to 90 cm, in deposit "f"—which Barnett (2002:165) has interpreted as "a till deposited directly from the base of a glacier."

Notwithstanding the above sequence, at the close of the reinvestigation report Julig (2002:300) concluded that "T. Lee's cultural chronology has not been substantiated." Instead he adopted a quarry model with preforms at different stages of production, which had become mixed into the deeper deposits. The idea of mixing was based largely on Storck's study of the projectile points and his own analysis of refitted artifacts.

The Place of the Projectile Points

Storck (2002) has done an admirable thing in bringing together in one place for illustration and discussion all the projectile points previously scattered through several of Lee's reports. I believe that he missed only a few. He also wanted to see whether the Paleo-Indian projectile points were, as Lee often asserted, associated with the Transitional soil, thus forming a critical time marker in the stratigraphic column.

While affirming that most of Lee's projectile points were indeed Paleo-Indian or Early Archaic, Storck (2002:149-151) remarked on their occurrence between 1 and 10 inches depth (2.5 and 25 cm). This struck him as significant given that, as he understood it, "Lee states that all of the projectile points occurred [… in] a 'transition' zone located between five and six inches [13 and 15 cm] below the surface." Their apparently greater vertical spread, he said, "casts doubt" on Lee's distinction of a projectile point–bearing Transitional layer. Julig (2002:300) accepted and amplified this conclusion, stating that "the points were found dispersed through-out several sedimentary strata."

Regrettably, an exclusive focus on the limits of "between five and six inches" distracted attention from the true situation. Storck had listed two Plano mid-sections as having been found at 3 and 4.5 inches (7 and 12 cm) depth, while still being within the Transitional deposit. That should have served as a warning, or at least a reminder, that specific artifact locations from a sediment of variable depth were being tested against what Storck acknowledged was a "generalized stratigraphic sequence" (2002:151). Ironically, under Storck's approach, any specimens that might show Lee right could instead be used to prove him wrong, merely by the circumstance of the Transitional soil having been buried by either more than six inches of humus or less than five.

Storck's listing of specimens would have been more useful if he had been able to connect the published drawings with Lee's catalogue numbers, which are the key to all further information. To obtain these, I went to the former Canadian Museum of Civilization (CMC) and to the Royal Ontario Museum (ROM) and asked to see the specimens and related documentation (Peter Storck himself graciously assisted me at the ROM). Quite often, Lee had recorded depth and deposit right on the artifact; if I could not find this information there, I usually found it in the catalogue or the field notes. For specimens found outside the Transitional layer, I was often able to determine both their relation to it and the depth of the layer at that spot by patiently working up and down through the excavation floor plans.

A revised list of all the Sheguiandah projectile points known to me is presented here in Table 1, with cross-references to Storck's (2002) Table 5.1. Clarifications to both Storck's and my own tables are appended in my footnotes to Table 1.

Most (n=29) of these 34 specimens came from the Habitation Area. For a substantial proportion of them, the catalogue mentions an association with the Transitional soil; that is, either in it or in

Table 1. *Revision of Storck's table of projectile points.*

Lee's Catalogue Number	Lee's Sketch	Location (station)	Grid Coordinates (in.)	Depth (in.)	Context	Item category assigned by Storck (2002: Table 5.1)	Cultural affiliation assigned by Storck (2002: Table 5.1)
155		UTS (SW side of hill)			Surface collection	Corner-notched no. 1	Post-Plano
188		(7-3)	Lens 42S 52E	1.5	In humus	Unstemmed lanceolate no. 11	–
259		(7-3)	Lens 28W 30N	4.5	Humus	Unstemmed lanceolate no. 7	?Plano
515		(7-5)	Lens 22N 44W	9	Pit	Stemmed lanceolate no. 1	Plano
211		(7-5)	Found in chip bag S side	2.5	Humus		
268		(7-5)	c. 41E 5S	5–6	Transitional at 6"	Side-notched no. 5	Plano/Early
335		(7-4)	15E 36S	7	Possibly in Transitional		

Lee's Catalogue Number	Lee's Sketch	Location (station)	Grid Coordinates (in.)	Depth (in.)	Context	Item category assigned by Storck (2002: Table 5.1)	Cultural affiliation assigned by Storck (2002: Table 5.1)
[catalogue number not known]						Mid-sections: no. 4	
898		(7-2)	27W 12S	5	Transitional	Tips: no. 5	_
944		(7-7)	56W 43S	1.5–2	Transitional	Unstemmed lanceolate no. 13	_
997		(7-1)	48S 48W	12	Charcoal under and around point: pit	Side-notched no. 6	Plano/Early Archaic
1017		(7-2)	43E 40S	8	In grayish soil at edge of pit	Tips: no. 6	_
1023		(7-2)	54W 13.5N	8.5	In buff (reddish) soil; Transitional soil at 7"		Plano
1469		(7-10)	10W 57S	5–6	Transitional	Stemmed lanceolate no. 2	

Lee's Catalogue Number	Lee's Sketch	Location (station)	Grid Coordinates (in.)	Depth (in.)	Context	Item category assigned by Storck (2002: Table 5.1)	Cultural affiliation assigned by Storck (2002: Table 5.1)
1096		(7-7)	4.5N 41E	3.5	Transitional	Unstemmed lanceolate no. 12	Plano
1108		(7-1)	17N 28W	4	In "possible" Transitional	Stemmed, triang. blade no. 2	Post-Plano
1154		(7-8)	48W 48S	4.5	Red soil plus Transitional	Mid-sections: no. 3	Plano
1201		(7-8)	38E 8N	6	In till touching Transitional	Stemmed lanceolate no. 3	Plano
1428		(7-10)	42W 16S	3.5–4	Transitional	Unstemmed lanceolate no. 4	Plano
1470		(7-10)	30W 24 – 84S	4.5–5	Transitional		
1445		(7-10)	48E 8N	3	In humus touching Transitional	Side-notched no. 1	Post-Plano

Lee's Catalogue Number	Lee's Sketch	Location (station)	Grid Coordinates (in.)	Depth (in.)	Context	Item category assigned by Storck (2002: Table 5.1)	Cultural affiliation assigned by Storck (2002: Table 5.1)
1457		(7-10)	12E 1S	4	Under Transitional	Tips: no. 1	Plano
1576		(7-10)	12E 1S	4.5	Red soil (?)		
1473		(7-9)	31.75W 38N	3	Black soil; Transitional at 4"	Corner-notched no. 2	Post-Plano
1482		(7-9)	E wall 37.5N	3.875	Transitional	Unstemmed lanceolate no. 6	Plano
1527		(7-9)	17.5E 36S	6.5	Below Transitional	Side-notched no. 3	Plano/Early Archaic
1559		(7-9)	56.75W 38N	5.5	Transitional	Unstemmed lanceolate no. 5	?Plano
1566		(7-10)	36N 13W	10	Transitional	Side-notched no. 2	Plano/Early Archaic

Lee's Catalogue Number	Lee's Sketch	Location (station)	Grid Coordinates (in.)	Depth (in.)	Context	Item category assigned by Storck (2002: Table 5.1)	Cultural affiliation assigned by Storck (2002: Table 5.1)
1622		Village garden, S side of hill			Surface find	Unstemmed lanceolate no. 3	Plano
1662		Middle Quarry Ridge	TT1 (0-6'S)	2		Unstemmed lanceolate no. 2	-
1683		Middle Quarry Ridge	TT1 (25-30'S) 26.5S 5E	1	Soil grey		-
2051		(7-11)	16E 38.5N	4.5	On till but touching Transitional	Mid-sections: no. 2	Plano
2052		(7-A)	8W 12S	3	In humus on Transitional		-
2091		(6-B)	30.25E 7S	0.75-2.25	Transitional and humus	Unstemmed lanceolate no. 14	Plano

Lee's Catalogue Number	Lee's Sketch	Location (station)	Grid Coordinates (in.)	Depth (in.)	Context	Item category assigned by Storck (2002: Table 5.1)	Cultural affiliation assigned by Storck (2002: Table 5.1)
2108		(7-12)	9.25E 5.5N	2.6			-
2109		(7-12)	54S 59E	2	Humus	Unstemmed lanceolate no. 15	Plano?
2135		(7-12)	19W 46N	5.875	Transitional	Side-notched no. 7	Plano/Early Archaic
"7-13"		(7-13)	S wall, c. 30" E (station 7-13 was on N. side of 7-5)	3	Transitional	Mid-sections no. 1	Plano

Footnotes: This table runs parallel to that published by Storck (2002:Table 5.1) and makes frequent reference to it. These notes offer comment, clarification, and correction to both Storck's list and this one.

Storck (2002) brought together most of T. Lee's sketches, which were dispersed through several of Lee's own reports (1954, 1955, 1957, 1964). Lee's discussion of them in those reports differs from Storck's. Lee's sketches of specimens Mav1-2109, Mav1-2135, and "7-13" have appeared only in Storck (2002). All but these last three projectile points, which are part of the missing Ridley collection, are held either at the ROM (six specimens; see below) or the CMC.

Specimens listed here but omitted by Storck:

Mav1-1683, Mav1-2052, and Mav1-2108.

Specimens listed by Storck but omitted here:

"Side-notched no. 4" and "Unstemmed lanceolate no. 9" (VIII-F:32507a and VIII-F:32507b). These catalogue numbers, which Storck said he did not understand, are simply the old National Museum's book number (VIII-F), which related to province of origin, with the sequential specimen acquisition numbers. He recorded that they were a gift from J. Notman in 1877 to Robert Bell, a geologist who surveyed the region in that period. Bell's collection was donated to the CMC

direct contact with it. There is no point in calculating percentages, because any denominator would be a matter of selection. It is more productive to consider overall vertical and horizontal distributions (Figures 2 and 3).

There is nothing in Figure 2 to suggest that the projectile points were dispersed "through-out" several deposits. A few were found in the humus and a few in the controversial deposits, but overall they tend to occur in or very close to the Transitional layer. The minor nature of the displacements, together with frequent breakage across the middle, suggest not geomorphic processes, but human trampling. The abundance of overlying artifacts and flakes indicates a concentrated human presence after Paleo-Indian times. Gifford-Gonzalez and colleagues (1985:808) found experimentally that, in loamy soil, only about 1 percent of lithic material set out on the surface was driven down more than 2 cm.

Not shown in Figure 2 are the few projectile points (Lee's nos. 515, 997, 1017, and 1566) that were found as much as 10 and 12 inches (25 and 30 cm) below the surface. Storck (2002:151) noted that one of them had been found in the fill of a precontact pit; Lee's field records further indicate that two more had come from such pits, and one from under a collapsed rodent burrow. One (no. 515) will be discussed in the next section; for the others, the reader is referred to Table 1.

The Displacement of Broken Artifact Fragments

More than a year before reopening the site, Julig reanalyzed Lee's artifacts. One of his goals was "to tabulate the number and context (location) of conjoinable artifacts in order to determine the extent of post-depositional mixing in the site sediments" (Julig and Mahaney 2002:109). He found artifact fragments that had been displaced downward as much as 66 cm, leading him to

only in 1964, five years after T. Lee had left the museum. There is no reason for suggesting, therefore, as Storck did, that either of these specimens might be the same as Lee's specimen O-Mav1-1154 (for Ontario, Manitoulin village site 1, field catalogue entry 1154). We do not even know what connection there was between Bell's collection and Sheguiandah—it may merely have happened to be the place of residence of Notman in 1877 and have nothing to do with the site.

"Tips, no. 2" (Mav1-1514.1), "Tips, no. 3" (Mav1-948), "Blade with portion of haft element, no. 1" (Mav1-1529), and "Unstemmed lanceolate, no. 8" (Mav1-290). Lee did not consider any of these to be projectile points. Neither he nor Storck illustrated them.

"Tips, no. 4" (Mav1-1483.1). Lee (1957:123) did not consider this to be a projectile point, but likely the hafting element of a finished tool. Julig (2002:112) thought it was a late-stage point preform. Lee, Storck, and Julig all illustrated it.

"Mid-section, no. 4" (1954-35-2). I have not seen this very small projectile point fragment, and without its catalogue number, I cannot link it to other information. Storck referred to it only by Lee's publication date and illustration number.

"Stemmed with triangular blade, no. 1" (Mav4-1778). This was not from the Sheguiandah site at all, but from a Middle Woodland site 150 m to the east (Mav4 vs. Mav1). It was illustrated by Lee in his report on that site (1965, Figure 5, no. 3). Storck also suggested that this specimen was the same as another illustrated by Lee (1957, Figure 4, no. 2), but that one is actually Mav1-1683.

Additional notes on specimens listed here:

Mav1-268. This, the tip of a refitted projectile point whose parts were found "separated a distance of 14 feet" (Lee 1954:103) was wrongly recorded as having come from Station7-2 in the field catalogue. It apparently came from Station 7-5. Station 7-2 was also open at the time, but would not be dug to the depth indicated for another year.

Mav1-1201. ROM catalogue number 955-161-238.

Mav1-1023/1469. This specimen, completed by the fitting together of matching parts, was among those Lee sent to the ROM in 1955. The glue subsequently failed and the upper part has gone missing, leaving only the base for Storck to present in his Figure 5.2. The ROM catalogue number is 955-161-241.

Mav1-1428/1470. ROM catalogue number 955-161-226.

Mav1-1482. ROM catalogue number 955-161-231.

Mav1-1559. ROM catalogue number 955-161-237.

Mav1-1622. Found in "Mrs. Trotter's garden"—her east garden, not the north one or the west one. Lee's maps of the time indicate a property owned by William Trotter, but not whether the gardens were on that property.

Mav1-1662. Possibly a projectile point; Lee (1957) favoured this view because efforts had been made to thin the base. ROM catalogue number 955-161-236.

"7-13" Found in salvage operations in 1957 and apparently not properly brought into the catalogue system. Only the south half of Station 7-13 was dug to about 15 cm depth in order to fill in and repair looting that had taken place since the close of excavations in 1955.

conclude that "considerable post-depositional mixing has occurred throughout the stratigraphic profile" (Julig and Mahaney 2002:134).

Julig drew his conclusions from 24 broken artifacts that Lee had fitted back together (Julig and Mahaney 2002: Table 4.3). In this sample, "most refits had vertical displacements of at least one stratigraphic level" (Julig and Mahaney 2002:117). It should be realized, however, that this was a very small sample out of a much larger population, and we do not know the detailed selection criteria. Judging by what Julig and I handled as we went through Lee's Sheguiandah collections together in 1996, there are hundreds of refitted artifacts to draw upon.

Still, Julig's sample does seem representative insofar as at least one specimen was included from almost all the Habitation Area excavation units, and that, as will be seen, is enough to suggest where post-depositional disturbance took place, and where it did not.

To this end, Figure 3 depicts the main Habitation Area excavations. Fragments of refitted artifacts that crossed stratigraphic boundaries are blacked in, as are the four projectile points from precontact pits. Strikingly, they tend to occur in a narrow east–west band across the excavated area.

This horizontal concentration of vertically

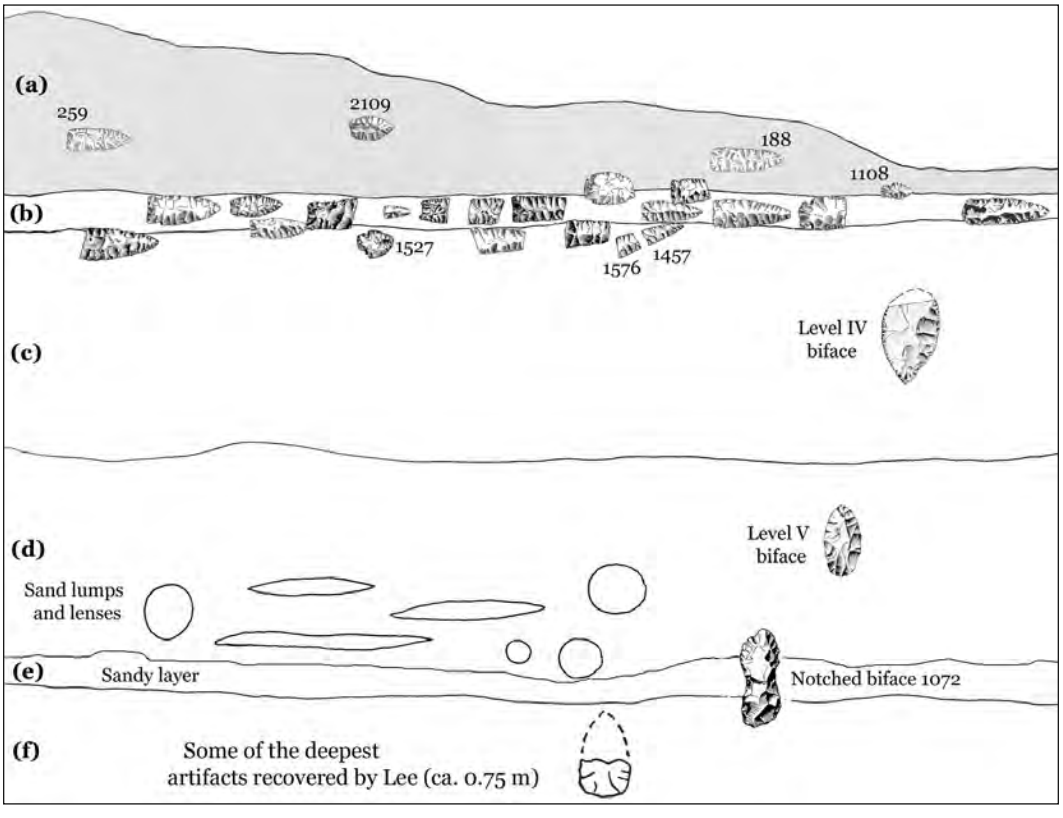

Figure 2. *Schematic profile showing where each projectile point lay in relation to the typically 1 inch (2.5 cm) thick Transitional stratum, which was directly below the humus (shaded), and also in relation to nearly the total depth of artifact-bearing deposits. Representative specimens are shown for the deeper layers. Sketches by T. Lee; catalogue numbers are given for specimens not so identified in Figure 3. Omits points found in precontact pits and those for which position could not be adequately determined, as well as specimens from outside the area shown in Figure 3.*

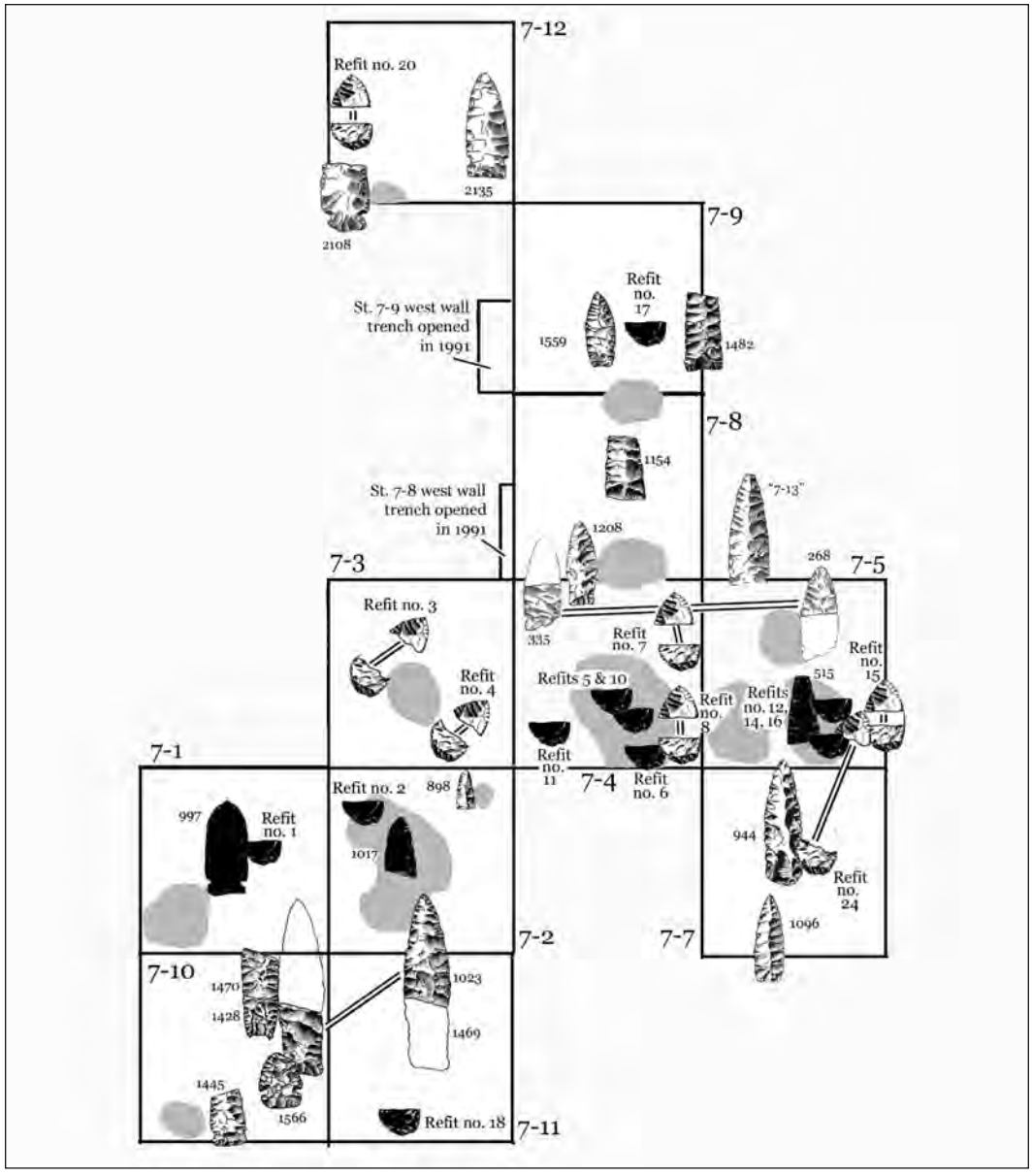

Figure 3. *Plan view of the main Habitation Area excavations, showing the distribution of projectile points, refitted artifact fragments, and precontact pits (shaded). Artifacts are greatly oversized to aid in their recognition. Each square is 3 m (10 feet) to a side; north is toward the top. Artifacts in black had significant vertical displacements. Many were in the fill of precontact pits, including four projectile points and fragments of other artifacts. Detailed sketches with catalogue numbers represent projectile points that were found in association with the Transitional layer. Generic sketches of biface fragments joined by short double lines represent refitted artifact fragments that were found in the same stratum. Matching fragments of projectile points, and of one drill that had significant horizontal separations, are joined by long double lines. Omits several artifacts for which positions could not be adequately determined.*

Table 2. *Revision of Julig's table of displaced artifacts (Julig and Mahaney 2002: Table4.3). Specimens where*

Refit #	Specimen #	Station	Depth (cm)	Depth (in.); grid coordinates (in.)	Displacement asserted (Julig and Mahaney 2002) (# of boundaries crossed)
1	973.1	7-1	17.5	D7; 60S 48 E	**Yes (1)**
	997.1	7-1	30.5	D12; 48 S 48W	
2	886	7-2	10–11	D4–4.5; 1.5N 48E	**Yes (2)**
	976	7-2	18	D7; 22E 35S	
3	98.2	7-3	0–7.5	D0–3; 24E 54 S	No
	165.2	7-3	10	D4; 48E 30 S	
4	259	7-3	11	D4.5; 29W 30N	No
	259	7-3	11	D4.5; 29W 30N	
5	78.1	7-4	0	Initial surface find; — —	**Yes (4)**
	598.1	7-4	66	D26; 62W 41N	
6	87.1	7-4	0	Initial surface find; — —	Yes (2)
	555.1	7-4	28	D11; E half of S wall	
7	216.1	7-4	7.5	D3; lens 48W 18S	No
	244.1	7-4	5.1	D2–4; SE quarter	
8	244.1a	7-4	5–10	D2–4; SE quarter	No
	324.1a	7-4	12–15	D5–6; SE quarter	
9	244.1b	7-4	5–10	D2–4; SE corner	No
	321.1	7-4	10–12.5	D5–6; middle of S wall	
10	273.1	7-4	10–12.5	D4–5; E third of square	**Yes (3)**
	526.1	7-4	38–48	D15–19; 30N 48W	
11	448.1	7-4	20–24	D8–9; SW quarter	Yes (1)
	530.1	7-4	45.5	D18; SW quarter	
12	238.1	7-5	7.5	D3; — —	**Yes (2)**
	515.1b	7-5	22.5	D9; lens 22N 44 W	
13	260	7-5	10	D4; — —	No
	238	7-5	7.6	D3; — —	
	260	7-5	10	D4; — —	
14	346.1	7-5	15	D6; lens 24N 53W	**Yes (1)**
	515.1a	7-5	22.5	D9; lens 22 N 44W	
15	480.1	7-5	10	D4; — —	**Yes (1)**
	505.1	7-5	17.5	D7; lens 25N 30W	
16	211	7-5	6.35	D2.5; — —	**Yes (2)**
	515	7-5	28.86	D9; lens 22N 44W	
17	1421.1	7-9	5–7	D2.25–2.75; S 1/3 of trench	No (0)
	1558.1	7-9	13.5	D5.25; 32N 30W	
18	2014.1	7-11	0–6	— ; 16N 42 W	No (0)
	2027.1	7-11	0–6	— ; 1N 30E	
19	2001	7-11	2.5	D1; 36E 54 N	Yes (1)
	2001	7-11	3.75	D1.5; 72N 36E	
	2002	7-11	—	— ; 54 S, 18E	
	2006	7-11	—	— ; 10N 50 E	
20	2101	7-12	3.75	D1.5; 46S 21E	No
	2114	7-12	—	— ; 53S 21E	
21	2059	8-B	5	D2; 19N 19E	Yes (1)
	2061	8-B	12.5	D5; 17N 20E	
24	368	7-5	8.75	D3.5; 28N 21W	**Yes (2)**
	1097	7-7	11.25	D4.5; 66N 54W	

displacements across stratigraphic boundaries were not confirmed are highlighted (bolded).

Displacement confirmed (# of stratigraphic boundaries crossed)	Comments based on Lee's field notes and related documents
No (0)	# 997.1 was in a precontact pit
No (0)	# 976 was associated with a precontact pit. See Figure 4.
No (0)	
No (0)	
No (0)	# 598 was in a precontact pit. See Figure 5.
Maybe (2)	# 555.1 may have been in a broad precontact pit (Lee 1954:106)
No (0)	
No (0)	
No (0)	
No (0)	# 526 was in a in precontact pit. See Figure 5.
Yes (1)	
No (0)	# 515.1b was in a precontact pit. See Figure 5.
No (0)	
No (0)	515.1a was in a precontact pit. See Figure 5.
No (0)	Both parts were in Transitional soil, despite the differing depths
No (0)	# 515 was in a precontact pit. See Figure 5.
Yes (1)	# 1421.1 was in humus; # 1558.1 in Transitional
Yes (1)	# 2014.1 was in Transitional soil; # 2027.1 in humus
Yes (1)	Two of the fragments were found in humus, lying flat on the Transitional layer; the other two were in Transitional soil.
No (0)	Both in Transitional soil.
Yes (1)	# 2059 was in humus, # 2061 in Transitional soil
No (0)	Correction of copying error eliminates asserted displacement. Both fragments in Transitional soil.

This table omits refit nos. 22 and 23 because they are from very different depositional environments on other parts of the site (a peat bog and a mass of quarry rubble).

Lee's catalogue entries were whole numbers, usually for batches of artifacts. Individual specimens within each batch were numbered 1, 2, 3 etc. in his field notes and sketches. Julig did not know this and, to distinguish specimens with the same catalogue numbers, appended arbitrary numbers (and sometimes letters, too) after a decimal point. These two systems have no relation to each other.

Sometimes the nearest position data available to me were the camera lens positions for in-situ photographs. It should be possible to work out exact positions by matching the specimens with their images in these photographs (which currently are archived only as negatives).

displaced artifacts suggests that some very localized factor was responsible. Julig and Mahaney (2002:118, 134) speculatively ascribed the presumed disturbance to "tree falls, downslope movement, frost action" and other, unspecified geomorphic activities. Surprisingly, they failed to mention what Lee had carefully documented in his field notes and reported in print (Lee 1954a; 1955)—the digging of pits in precontact times.

Such pits, it may be remembered, were a prominent feature of the part of the Habitation Area that Lee first excavated, where he said outright that he could not discern any clear-cut stratigraphy. Samples and conclusions should be drawn here with extreme caution. To see if the specimens Julig put forward really do represent mixing by geomorphic processes, we will have to consider them one by one. Julig's table of refitted ("conjoined") artifacts is repeated here, with some additional information and revisions, as Table 2, omitting only some from outside the Habitation Area.

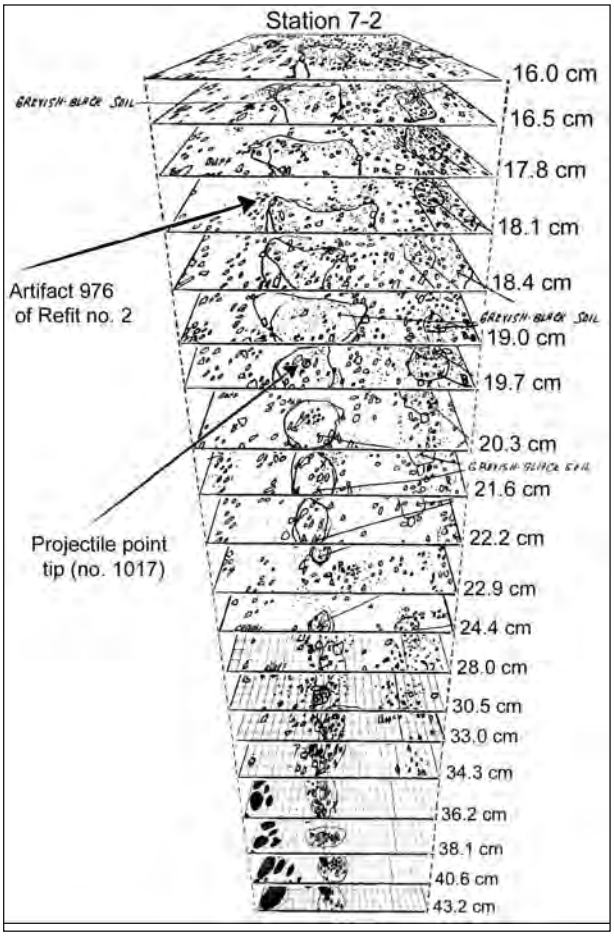

Figure 4. *The superimposed plans of the north half of the Station 7-2 trench floors at different stages of excavation, shown in perspective view. One of the two pit features was associated with a projectile point and one fragment of refitted artifact no. 2 (see Table 2). The left–right dimension is 3 m. Quartzite fragments are drawn in white; natural cobbles, in black.*

In refit no. 1, the more deeply buried fragment (997.1) was found with projectile point 997—the same point that Storck noted as having come from the bottom of a pit (Lee 1955:63; Storck 2002:151).

Refit no. 2 had two parts, one found at about 10–11 cm and the other at about 18 cm depth. The resulting separation would cross two stratigraphic boundaries, with the Transitional soil sandwiched in between. Quite another interpretation is suggested by the catalogue, which, notes that the deeper fragment lay in "red soil near black soil" – the black soil, as it turns out, of a precontact pit. How near may be judged from its position in Figure 4. I think it would be unwise to argue that this fragment was not associated with a pit feature.

Refit no. 5 represents the most extreme displacement Julig found, as the fragments were separated vertically by 66 cm. The context of the deeper one was given by Julig as "Stratigraphic Level V." In the CMC site catalogue, however, its context was stated simply as "PIT," together with the specimen's coordinates. The relevant field notes describe the excavation of a precontact pit over an extended period (Aug. 21 to Sep. 8, 1952), going down about 2 cm a day. The artifact fragment in question was found just below a "nest" of charcoal, at its bottom (Lee 1954:104). This feature is illustrated in Figure 5.

How this artifact, which had been labelled as coming from a pit, came to be

represented as being in "Stratigraphic Level V" is extremely significant. If I have read his words rightly Julig (in Julig and Mahaney 2002:117) was placing Lee's artifacts in stratigraphic levels on the basis of depth. "Level V" is the stratum the pit had penetrated and which surrounds it at that depth. Hence, the item could be said to have been in an extension of the topmost deposit, and not in a lower level. Some of the following cases appear comparable.

The coordinates for the next-greatest displacement, refit no. 10, place it quite close to refit no. 5, but higher up. It was standing vertically in a deep pocket of Transitional soil. Its relation to the same pit feature can also be seen in Figure 5. Julig gave its context as "Level IV," which again is that of the surrounding stratum, and had it crossing three stratigraphic boundaries.

For three more artifacts, refits no. 15, 17, and 18, the substitution of a presumed deposit of origin for what was recorded has produced incorrect results. For refit no. 15 Julig apparently translated the depths of 10 and 17.5 cm into his Stratigraphic Levels I and II. The catalogue entries for both fragments, however, are the same: "Transitional." A displacement across boundaries was created that did not exist.

With refits no. 17 and 18, the opposite happened, and displacements across a single boundary were obscured. The depths of both pairs of fragments were translated into Stratigraphic Level I (i.e., the humus), but in each case one part was actually found in the Transitional soil.

The displaced fragments of refits nos. 12 (specimen 515.1b), 14 (specimen 515.1a), and 16 (specimen 515) occurred in a "nest" of flakes, bifaces, and blocks of quartzite. Specimen no. 515 was actually part of a broken projectile point. The catalogue gives only the depth for these specimens (translated by Julig as "Stratigraphic Level III"), but the preceding catalogue entry says "PIT"—again, a warning. In Lee's field notes for the no.

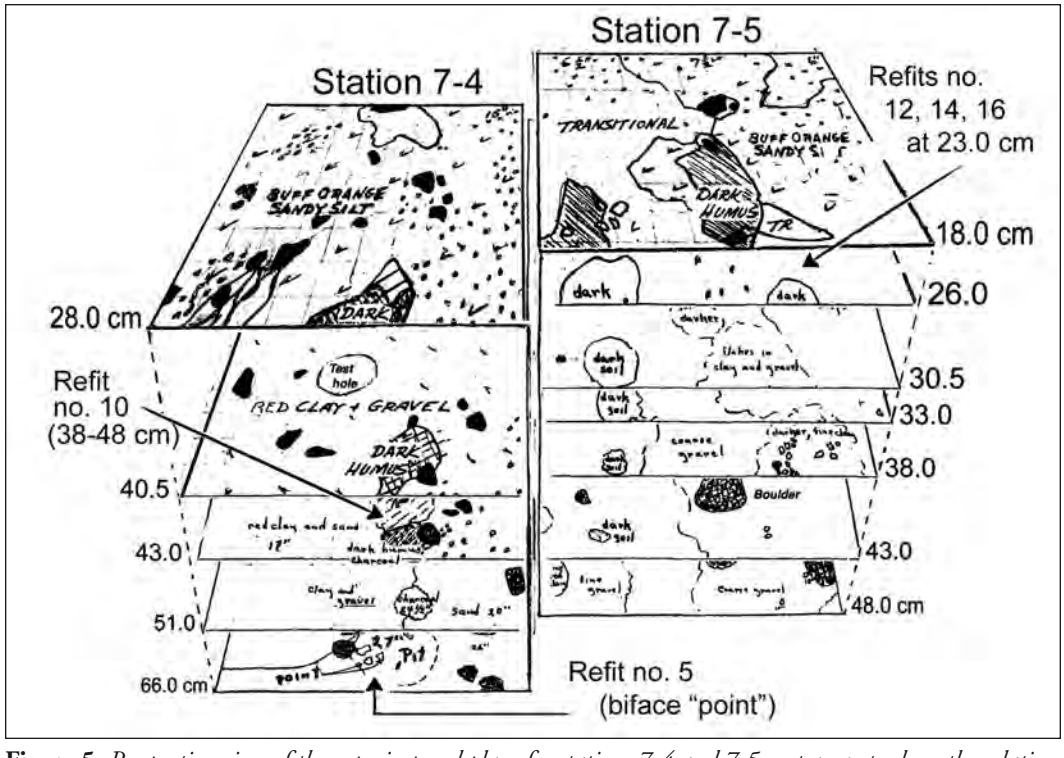

Figure 5. *Perspective view of the superimposed plans for stations 7-4 and 7-5, cut away to show the relation of refitted artifact fragments to pit features.*

515 cluster, he said he thought he might be at the bottom of a pit. As Figure 5 shows, the chip concentrations of this feature continued down for another 25 cm.

Two refits (nos. 6 and 11, from the southeast and southwest quadrant of Station 7-4) do show significant displacement and are without any direct association with pits. They are still, however, in the east–west zone of generalized disturbance.

Refit no. 19 is a biface broken into four pieces. Two were catalogued as being from the humus ("Stratigraphic Level I") and two from the Transitional ("Level II"). The field notes describe how fragments here were lying in humus on Transitional soil and in the Transitional itself. These circumstances suggest breakage, and really very minor vertical movement, under the impact of human feet.

Refit no. 24, a drill, was mistakenly presented by Julig as a displacement because of a copying error. The depth Julig put down for one fragment was 20.32 cm below a theoretical datum plane, rather than its actual depth of 11.25 cm. The other was at 8.75 cm (actual depth). This produced an apparent vertical separation that, translated into stratigraphic levels, would cross two stratigraphic boundaries. In fact, the fragments were both in the Transitional sediment, and only 2.5 cm apart vertically, despite being separated horizontally by 2.2 m (Lee 1955:65). Horizontal separations like this one were as important to Lee as the vertical separations, providing excellent evidence for a lack of disturbance. The parts of several broken projectile points had been found as much as 4.5 m apart horizontally, but at corresponding levels vertically (Lee 1954a:103; 1957:122). In Figure 3, these specimens are connected by long double lines.

The distribution of displaced artifact fragments in Table 2 coincides with the zone of disturbance Lee struggled with in his first two field seasons. Real displacements can usually be traced to precontact pits, which represent intrusions, not mixing of strata. By contrast, refitted artifacts showing minimal disturbance and projectile points consistently associated with the Transitional soil were widely distributed, and occurred in many places where the stratigraphic profile is clear (Figure 3). From this, it seems reasonable to conclude that, across significant portions of the Habitation Area, the deposits have probably not been significantly disrupted by post-depositional processes.

Supporting Evidence

There are several additional reasons for thinking that Storck's and Julig's perceptions of site disturbance are not as well supported as they have argued them to be—for thinking that the Habitation Area deposits visible in the trenches did indeed represent sediments as they were laid down, with artifacts in place within them.

First, the Habitation Area was never ploughed; nor had it been discovered and ripped open by relic hunters (Lee 1953).

Second, the relatively flat ground surface shows that the uprooting of trees has been a minor factor. This is a very unusual circumstance, but one confirmed by Lee's detailed map of the Habitation Area (see Lee 2002:52). Contoured at 1 foot (30.5 cm) intervals, it doesn't show any repeating pattern of hollows and mounds with relief of 0.5 to 1 m, such as is common in forests prone to uprooting (Beatty and Stone 1986). The evenness of the surface is also apparent along the length of Lee's 90 m of trench profiles (Figure 6). Portions of these trenches can be seen on any of the profile sketches and photographs reproduced in T. Lee (1957:134-136), R. Lee (2002:27), and Barnett (2002:168-169).

Third, the post moulds of a precontact shelter at the Early Archaic/Paleo-Indian level (Lee 1964:24; Lee 2002:46) show that Station 7-12, at least, has not been subject to physical disruption since those times.

Fourth, comparing artifacts of the upper and lower till-like sediments (deposits "c" and "d"), Lee (1957:122) described differences that were both technological (manufacture on cores vs. flakes, and primary vs. secondary chipping) and morphological (size and thickness). Julig and Mahaney (2002:110) attempted a statistical comparison, but we do not know to what extent the samples included specimens from precontact pits.

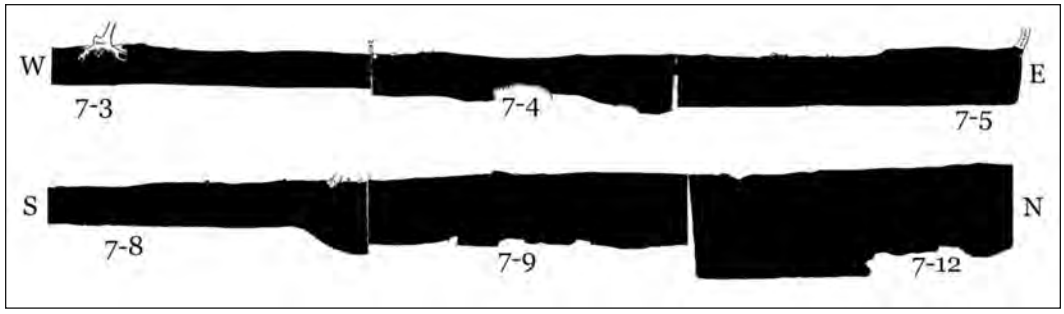

Figure 6. *E–W and N–S profiles of Habitation Area trenches, each set 9 m (30 feet) long, blacked-in to emphasize the low surface relief. Had the uprooting of trees been a prominent factor, typical hummock-and-hollow terrain would have developed, with a vertical range equalling the average depth of the trenches (about 0.5 m).*

Fifth, fabric studies on elongated pebbles in the controversial deposits showed that there was a measurable tendency for them to have preserved a depositional alignment (Lee 2002:48-49; Julig and Storck 1992:57). Any postulated geomorphic process that might have moved artifacts up and down through the deposits would inevitably tip, twist, and rotate these pebbles, destroying the fabrics. Dispersed throughout the deposits, oriented pebbles offer widespread, fine-scale evidence against post-depositional disturbance.

Finally, the concept that there was mixing "through-out" the stratigraphic profile, which archaeologically is almost a metre deep and geologically twice that, should never have gained credence. Certainly no such mixing reached down as far as the lenses of sand ("stringers") at 40–50 cm depth. And the Transitional soil at (speaking generally) 15 cm precludes wholesale mixing since Paleo-Indian or Archaic times.

Conclusions

Recent decades have seen greatly enhanced awareness of the possibilities for cultural material to be moved about in the soil, to the discomfort of unsuspecting archaeologists. Quoting Paola Villa (1982:287), Gifford-Gonzalez and colleagues (1985:804) wrote: "Without evidence to the contrary, 'layers and soils should be considered as fluid, deformable bodies […] through which archaeological items float, sink, or glide.'"

This paper is all about Lee's "evidence to the contrary" and how it was turned on its head. His association of projectile points with the Transitional soil was doubted by Storck, but has, I think, been substantiated here. Julig re-analyzed Lee's refitted artifacts and, sometimes from the very specimens that most dramatically showed stratigraphic stability by their horizontal separation, obtained diametrically opposed results. I believe that the conclusions of wholesale mixing drawn from that study have been shown here to be unwarranted. The positions of the artifacts do have stratigraphic meaning, and that has not been taken into account since the days of Sanford and Lee.

Considering the overall situation, it seems probable that enough of the site is sufficiently free of major post-depositional disturbance to provide useful insights into both its archaeological and geological interpretation. These insights include the possibility that arguments for glacial till may turn out to have more merit than those for a post-glacial beach.

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Les pointes de projectile paléoindiennes du site Sheguiandah sur l'île Manitoulin, en Ontario, ont joué un rôle important dans la datation du site à la fois dans les années 1950 et dans une nouvelle enquête dans les années 1990. Par contre, les conclusions des deux enquêtes étaient radicalement différentes. Cette divergence d'opinion ne découle pas de la classification des objets, mais plutôt de leur position dans le sol. À l'origine, ces échantillons de période temporelle restreinte étaient décrits comme étant limités à une fine couche de sol, divisant la matière culturelle du dessus de celle du dessous. La présence d'artéfacts sous le niveau paléoindien a eu des conséquences sur leur datation géologique, les situant plus tôt dans le temps et, il a été débattu, en dépôts de till (de l'âge glaciaire). Une réévaluation de la provenance de ces pointes de projectile et de fragments d'artéfacts réaménagés dans les années 1990 a complètement changé la vue d'ensemble, pointant plutôt vers une perturbation et un mélange substantiels suite aux dépôts, et elle a ouvert la voie vers une nouvelle datation du site en tant que site postglaciaire. Une révision de cette réévaluation montre maintenant qu'elle était sans fondement. Les répartitions des artéfacts réaménagés et des pointes de projectile ont tendance à soutenir l'interprétation originale qui stipulait que les sédiments étaient en grande partie intacts et qu'ils entretenaient des relations significatives.

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