

**The Walker Hill Site (21CA668):
Comments on the Possibility of a Late Glacial Human Presence in Minnesota**

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In mid-January 2007, there was a minor media frenzy in Minnesota generated by the report that stone tools had been found in the northern part of the state apparently dating to the period of glacial retreat 14,000 years ago. Stories appeared in local newspapers, the *Minneapolis Star Tribune*, and on Minnesota Public Radio. It went national when the wire services picked up the story. The Minnesota State Archaeologist began to get calls asking for more details. In mid-January, I didn't know many of the details, but on 2/10/07, a presentation on the site was made to the Council for Minnesota Archaeology (CMA) research symposium in Mankato and the artifacts from the site were made available for examination. This paper is based on the CMA presentation and my discussions with archaeologists in attendance. A detailed site report is not yet available.

The Walker Hill site (21CA668) is located in north central Minnesota near the southeast edge of the town of Walker. The site is on a hill about a quarter mile from Leech Lake, one of the largest lakes in Minnesota. The site was first examined by archaeologists in October, 2004 after the Minnesota State Historic Preservation Office (SHPO) recommended an archaeological survey where the City of Walker was planning to build a community center utilizing funds supplied by USDA Rural Development. Although the project location was on private land at the time, the use of federal funds prompted the SHPO review under Section 106 of the National Historic Preservation Act.

The survey was carried out by the Leech Lake Heritage Sites Program (LLHSP), an experienced archaeological contract firm based at nearby Leech Lake Indian Reservation. This first survey located a depression that was thought to be the remnants of a house pit possibly associated with early White settlement in the area or even the Fur Trade, although limited sub-surface testing produced no early historic (or prehistoric) artifacts (Olmanson and Wells 2005). In order to better determine the significance of the pit feature, additional archaeological examination was undertaken by the Leech Lake crew in the Fall of 2005 (Olmanson and Wells 2006). This evaluation survey excavated seven 1 x 1 meter units in and near the pit feature. The test units that yielded historic artifacts suggested the pit was of mid-20th century origin and was therefore not significant.

The second survey did, however, yield a number of items that were considered by the investigators to be stone tools and stone debris of human manufacture and use. Included were a large "hammerstone" and a "chert tool fragment", the only two artifacts illustrated in the second report. Also recovered were 13 flakes of various local materials and three pieces of lithic "shatter." The lithics were from 70-110 cm below the modern surface. Because most of the stone "artifacts" were from a deep soil horizon that appeared to be glacial-age deposits and sealed by a possible wind-blown sand layer, the investigators

concluded that the lithics were very old and probably were associated with the glacial retreat from the Walker area, which they dated to 13,000 – 14,000 years ago.

Based on the presence of the possible early prehistoric site, the USDA and the SHPO concurred that the site was significant and that it would be adversely affected by the proposed community center construction. A Memorandum of Agreement (MOA) was developed by the SHPO and the USDA that required extensive archaeological excavation of the site prior to its destruction by the community center.

In the summer of 2006, the LLHSP crew undertook a detailed examination of the Walker Hill site in accordance with the conditions of the MOA. Thirty-three (33) additional square meters were excavated. Additional lithics were recovered from the test units and from examination of the eroded walls of nearby cut banks. No other types of archaeological materials were evident such as animal bone or features such as hearths.

In early December 2006, several Minnesota archaeologists, soil scientists, and glacial geologists visited the Walker Hill site at the invitation of the SHPO and LLHSP. They were shown the recovered lithics, but the actual excavation units that had yielded these materials had been partially backfilled covering the lower horizons. There were exposures of the soil column in nearby cut banks, however, and these exposures were examined by the visitors. They also looked at pictures of the excavation units. The purpose of this visit was to generate support for preserving the site. The subsequent release of information to the media also had this objective.

Howard Hobbs, a glacial geologist with the Minnesota Geological Survey and one of the December site visitors, transmitted an email dated 12/12/06 with a number of observations regarding the geologic setting of the Walker Hill site: 1) Some of the purported artifacts appeared to be buried by a meter or more of glacial sediments. 2) The site had a number of clear depositional layers. 3) There was no evidence of permafrost that could have caused massive frost-heaving disturbing these layers. 4) There was no evidence for post-glacial slope wash or soil creep. 5) A layer of fine sand capped the glacial deposits and may represent a wind-blown deposit from the immediate post-glacial period. 6) The lower horizons where the purported artifacts came from were all “high-energy” meltwater deposits related to an adjacent large meltwater channel that cut through the moraine. 7) The Itasca Moraine where the site sits dates to roughly 15,000 years ago.

Because the final report on the Walker Hill site has not been completed, the CMA meeting on 2/10/07 was the first chance for the larger Minnesota archaeological community to hear firsthand about the excavation and examine the recovered lithics. The illustrated paper on the site was not delivered by the principal investigators (i.e., the archaeologists), but by a biologist from the crew who has some archaeological field experience in the region. He also answered the questions during the paper presentation, although the principal investigators were available to answer questions later when the artifacts were on display.

The LLHSP paper on the Walker Hill site first examined the site's geomorphology. Although no profile sketches were presented and the unit wall photographs illustrated a good deal of variation, the basic description said the modern soils were underlain by a thick (ca. 40 cm) Aeolian (loess) deposit followed by a water-sorted sand/gravel/cobble layer, then a water-sorted sand layer, and finally a layer of large boulders. Most "artifacts" had come from the layer immediately below the wind-deposited sands, although the "hammerstone" was from a lower horizon. (In general, the paper did not present a comprehensive picture of the provenience of the purported artifacts, but it was clear from the bag labels that they came from relatively widespread vertical and horizontal locations. Some of the lithics even came from surface finds in adjacent cut-banks.)

Photographs of the lithics were accompanied by descriptions such as "very expedient", "possibly exotic material", and "probably used for." We were assured that "glacial action" did not produce the lithics according to the glacial geologist who was consulted. Yet the investigators reported they had contacted a researcher in Manitoba who was working on distinguishing naturally from culturally produced lithics indicating their concerns about the nature of the Walker artifacts. We were told they intend to return to the site in the summer of 2007 to do additional excavations providing the construction of the community center does not destroy the site.

Questions from the audience regarding the crudeness of the tools were answered by "these were pre-Clovis people" and "there was a lack of good raw material in the vicinity." In response to a question as to why this was a "pre-Clovis" site, the presenter said Clovis dated to "11,500 years ago", although *corrected* dates suggest Clovis as old as 13,500 years ago (cf. Fiedel 2002).

Following the presentation, many lithic-knowledgeable Minnesota archaeologists examined the collection. These archaeologists included Leroy Gonsior, Bruce Koenen, Kent Bakken, Brian Hoffman, Dave Tennesen, Gilliane Monnier, Mark Muniz, and Dan Wendt. While the educational credentials of these archaeologists may vary, they are all experienced lithic researchers and are widely respected in the Upper Midwest and Plains. Following their examination of the Walker Hill lithics, I discussed the collection with all of them and independently polled most of them asking a standard set of three questions: Did you see any clearly obvious stone tools of human manufacture? Did you see anything that could not have been produced by a natural process? What is your overall opinion on the reality of the human occupation of the site?

Based on the answers to these questions and my own observations, here are my conclusions regarding the Walker Hill site:

- 1) The purported stone tools are mostly pebbles, 2-3 cm in diameter with limited flake scars on the edges. There are no formal tools such as projectile points or endscrapers. There are no blades or obvious bifaces.
- 2) All the raw materials of the "artifacts" from the site can be found in the local till. This includes quartzites, Red River Chert, Swan River Chert, Jasper Taconite,

- Lake Superior Agate, Hudson Bay Lowland Chert, rhyolite, quartz, and siltstone (cf. Bakken 1999).
- 3) All the re-working/flaking/abrading of the “artifacts” could have been produced by natural processes, specifically rapid stream action and frost shatter.
 - 4) The raw materials are quite various and there is no evidence for selection of one particular type, especially among the “micro-artifacts.”
 - 5) The purported “tools” were so crude as to be unconvincing or would have been difficult to use for the proposed tasks. The “hammerstone” was too heavy and too large to be used for effective tool production on small cores, the “battering” on the end was unfocused and inconsistent with tool production wear, and the piece was more suited to be an anvil stone used in bipolar manufacture, but there was no evidence for this on the face. The knives are bulky with limited edge exposure and very little bifacial flaking evident. The scrapers likewise do not have extensively worked edges. Two large “choppers” exhibited limited and only unifacial retouch. Any of the tools *could* have been used for the purported purposes, but they would have been inefficient for these uses and much more appropriate tools could have easily been produced.
 - 6) There was no evidence for bipolar reduction or heat treating, which is essential to effectively deal with certain types of local raw material (e.g., Red River Chert).
 - 7) There was no evidence for biface production, which is *the* principal activity at many Clovis sites.
 - 8) Some of the flake scars were relatively sharp and others were relatively dull suggesting an intermittent abrading process such as water tumbling. Many of the “micro-artifacts” had rounded edges.
 - 9) The one flake that most people agreed was “good” came from near the bottom of the initial evaluation test unit within the mid-20th century pit. The excavation level immediately below the level with the flake contained mid-20th century materials so it was clearly from a disturbed setting.
 - 10) The vast majority of the lithics from the Walker Hill site did not demonstrate the characteristics that one would expect from humanly produced stone artifacts: a) a platform, b) a point of percussion, and c) a bulb of percussion. While a few flakes did exhibit simple platforms and a bulb, there was no evidence for prepared, multi-faceted platforms one would expect from biface technology. Simple platforms and bulbs can be produced by natural processes.

Based on these factors inherent in the lithics recovered from the site, it was the unanimous conclusion of the experienced lithicists that the great majority of the collection was produced by natural processes, there were a few “maybe” flakes, and there were clearly no stone tools of obvious human manufacture or use. The majority of the other archaeologists in attendance (myself included) who don’t claim to be lithicists, but have extensive experience dealing with stone tools came to the same conclusions.

Beside the analysis of the Walker Hill lithics, a number of other factors would argue against an early prehistoric human occupation at the site:

- 1) There is no evidence for a pre-Clovis horizon anywhere in the Upper Midwest except perhaps in extreme southeastern Wisconsin (cf. Overstreet 1998) and no evidence (e.g., surface finds) for even a Clovis horizon in this part of Minnesota.
- 2) There was no non-stone tool evidence for human occupation of the site (e.g., fire-cracked rock, animal bone, soil features).
- 3) The artifacts are vertically scattered through at least 50 cm in multiple discrete sediment horizons and the horizons containing the artifacts were laid down by rapid water action. The nature of these horizons is not completely clear (e.g., the upper “loess” horizon could be basically a clay layer of re-worked Aeolian sediments).
- 4) The presence of “exotic” raw materials, the use of excellent flaking material, and the heavy reliance on one type of material are almost universals at Clovis sites in North America and one would expect that Clovis people utilized manufacturing techniques and acquired material preferences from their immediate predecessors.
- 5) There are good (though maybe not excellent) flaking raw materials that can be found in the local till and in Late Glacial times the surface would have been littered with cobbles so people would have had their easy pick of the best materials. Late Paleoindian, Archaic, and Woodland peoples certainly made some very nice and very obvious tools using these local materials, especially when heat-treatment and bipolar flaking were applied. Bipolar tested cobbles are common at some of these sites. Bifaces are common at early sites.
- 6) The earliest inhabitants of the New World came from Old World lithic manufacturing traditions that had over two million years to perfect their craft (cf. Delagnes and Roche 2005) so one would expect some degree of skill demonstrated in the Walker Hill lithics. *High* quality workmanship is one of the distinguishing characteristics of the entire Paleoindian period.
- 7) Lithic edges do not naturally dull overtime if they are buried in relatively stable soil conditions. Edges produced 12,000 years ago are just as sharp today. If the lithics were found in or at the bottom of the “loess” layer and if that layer is indeed wind-deposited, some abrasion of the tools could have occurred, but most of the “artifacts” clearly came from below this layer and the abrading would have been focused on the top exposed surface. This was not apparent on the Walker lithics. Human use can also dull edges, but this use should be microscopically evident and be easily differentiated from natural processes.
- 8) Natural processes can produce multiple flake scars in the same basic location on a single cobble, can produce crude bifacial flaking, can result in obvious bulbs of percussion, and will produce macro versus micro flakes in the same basic percentages as human tool making (cf. Grayson 1986, Nash 1993).
- 9) This would have been a very uninviting environment in Late Glacial times with open spruce forest (not tundra grassland) extending almost to the edge of the glacier. While this environment no doubt contained small herds of proboscidean megafauna and other animals, no mammoth finds have been reported from northern Minnesota and only one find of a mastodon. More importantly, the Walker area would have had a very unstable land surface in Late Glacial times with ice-block collapse and massive outwash flows as demonstrated by the geology of the Walker Hill site. Year-around local cooling would have been in

effect due to the nearby ice mass. The area was also isolated from the rest of North America 14,000 – 15,000 years ago with glacial ice to the north, west, and east and virtually uncrossable meltwater rivers to the southwest and southeast except perhaps over frozen surfaces in winter, the least attractive time of year. In a land with very few people and lots of better places to live, what was the attraction of this location?

In the end, the most convincing evidence that the site is not an early human occupation is the fact that a glacial geologist has suggested that a “high energy environment” (i.e., massive glacial outwash) produced the sediment layers that contain the “artifacts,” that the “artifacts” are all made out of materials contained in the local till, that the relative percentages of raw materials the “artifacts” are made from exhibit no preferences or patterning, and that no formal tools or formal manufacturing processes are evident. Such environments have been shown to produce “naturefacts” that greatly resemble artifacts.

The final report of the mitigation excavation should address all of the above points. It needs to have experts assist in the preparation of the geomorphological analysis and the lithic analysis. The provenience of all the purported artifacts, both vertical and horizontal, has to be well documented with sketch maps, wall profiles, tables, and photographs. If the detailed lithic analysis concludes that the lithics are likely not artifacts, there is little point in spending extensive efforts in the report reconstructing the paleoenvironment and discussing the pre-Clovis horizon in the New World. If additional field work is planned for the site, an explicit research design should be prepared.

Based on the above analysis, there is no evidence that the Walker Hill site represents an early human occupation of Minnesota. Additional work at the site would probably only confirm this conclusion. If the investigators wish to pursue additional research at the site, I would make the following suggestions:

- 1) Have a widely recognized stone tool expert examine the entire collection. This should include an examination of the debitage to determine if stone tools were actually produced at the site even if none were recovered.
- 2) If this expert concludes that there may be some “real” artifacts in the collection, return to the site with an unbiased outside archaeologist experienced in excavating complex and early sites.
- 3) Examine a similar setting in the vicinity but distant enough to assure independence to see if the same sediment horizons produce similar lithics. It is unlikely that both locations would represent rare early prehistoric sites.

It must be stressed that there was no intent on the part of LLHSP to mislead the regulatory agencies or the City of Walker by recommending a full mitigation excavation at Walker Hill. LLHSP personnel were clearly excited (as were the rest of us) by the possibility that they had discovered a very early archaeological site, perhaps one of the earliest in North America. Their optimism regarding the cultural reality of the lithics was complicated by the lack of a true lithic expert on their staff and the complexity of the geological setting. The recent media attention has clearly made them uncomfortable.

That said, mistakes were still made and there are lessons to be learned from the Walker Hill experience. First of all, experts on lithic technology and geomorphology should have been consulted during the second phase of the project not just at the end of the third phase. Regulatory and funding agencies must be more cautious and realistic when assessing the results of evaluation surveys, taking into account the relative skills of the investigators and the strength of the information prior to concurring that particular sites are indeed highly significant and in need of expensive mitigation. Site avoidance is under-utilized as a management strategy, especially early in the review process.

We should also note that the Walker Hill site is just one of many sites (e.g., Calico Hills, Texas Street) that have been proposed as representing the pre-Clovis horizon in the New World. Many of these sites have been beset with problems similar to those at Walker Hill: excavation by just one set of “generalist” archaeological investigators, a lack of firm dating, complicated stratigraphy, artifacts in secondary contexts, and a preponderance of “artifacts” that are more likely “naturefacts.” Archaeologists also need to be more aware of the recent advances in radiocarbon date correction (Clovis is 2,000 years older than we thought) and that “BP” and “years ago” are not the same.

Furthermore, our expectations of pre-Clovis should not be so low. These were not knuckle-dragging proto-humans, but people who came from a technological tradition that in many ways was near its peak. We should expect to find evidence for expert stone tool technology in well preserved and datable settings. To make early sites believable, we also need to bring robust teams of multi-disciplinary investigators in at the front end, not at the back end after controversy arises.

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References Cited

- Bakken, K.
1999 Lithic Raw Material Resources in Minnesota. *The Minnesota Archaeologist* 55:51-83
- Delagnes, A. and H. Roche
2005 Late Pliocene Hominid Knapping Skills: The Case of Lokalalei 2C, West Trukana, Kenya. *Journal of Human Evolution* 48(5):435-472
- Fiedel, S.
2002 Initial Human Colonization of the Americas: An Overview of the Issues and the Evidence. *Radiocarbon* 44(2):407-436.

- Grayson, D.
1986 Eoliths, Archaeological Ambiguity, and the Generation of Middle Range Research. In *American Archaeology Past and Future*, edited by D. Meltzer, D. Fowler, and J. Sabloff, Pp. 77-133. Smithsonian Inst. Press, Washington.
- Nash, D.
1993 Distinguishing Stone Artifacts from Naturefacts Created by Rockfall Processes. In *Formation Processes in Archaeological Context*, edited by P. Goldberg, D. Nash, and M. Petraglia, Pp. 125-138. Prehistory Press, Madison.
- Olmanson, T. and C. Wells
2005 Archaeological Reconnaissance Survey of the Walker Area Community Center Site in Cass County, Minnesota. Contract Completion Report. Leech Lake Heritage Sites Program, Cass Lake, Mn.
2006 Phase II Archaeological Testing of Site 21CA668 on the Proposed Walker Area Community Center Site in Cass County, Minnesota. Contract Completion Report. Leech Lake Heritage Sites Program, Cass Lake, Mn.
- Overstreet, D.
1998 Late Pleistocene Geochronology and the Paleoindian Penetration of the Southwestern Lake Michigan Basin. *The Wisconsin Archaeologist* 79(1):28-52