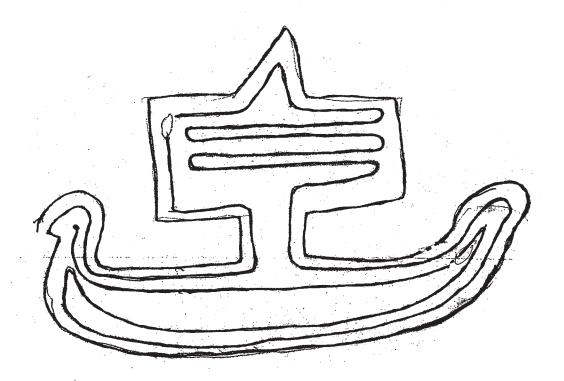
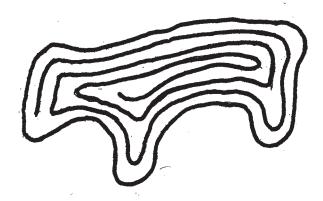
# Ancient Sea Travelers and the Ship Site in Copper Harbor, Michigan





By
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Deep Groove

#### **Acknowledgments and Appreciation**

Especially to David Hoffman and Susan English who made it possible for me to see the Ship Site. To Susan English, Ritchie Brown, and Jay Mullins, who helped with the field surveys at the Ship Site. To William Wenzle, former student and now a professional land surveyor in Prairie du Sac, Wisc., who gave me his old total station field instrument to use on such projects. (In times of rapidly changing technology, this was much better than the instruments we formerly used on such projects, such as with the Old Fort Site on the north shore of Lake Superior in 1985. Those to whom I am indebted for help with the field survey of the Old Fort Site are listed in the following pages.) To Jay Mullins, also a former student, and now a successful civil engineer in Madison, who gave me some of his old drafting equipment to keep me up to date with the new changing surveying technology, after I retired from teaching. He got me into using the DeLorme mapping software, which was extensively used in this report. And to all other unnamed persons who helped with this work.

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#### Introduction

The now famous Ship Petroglyph at Copper Harbor was known to Dave Hoffman, Susan English, Scott Wolter, and others before most of the rest of us knew about it. In Appendix A are sketches and tracings from my field note book from 18 May, 2008, when we were first shown the site by David Hoffman at a special meeting of the Ancient Waterways Society, hosted by Susan English. Before them, local hunters (and apparently others, as well) also knew of the site. In recent years, it has become widely known. I refer to it as part of the "Ship Site" of Copper Harbor, in the Upper Peninsula (UP) of Michigan.

At our last meeting of AAPS (Oct., 2012) I mentioned a friend of mine, Prof. Jack Steinbring, past head of Archaeology Department at Winnipeg (international expert in Rock Art) who retired and moved to his family's Octagon House in Ripon, Wisc. He has continued with archaeology and rock art, and is considered one of the world's experts in Rock Art. I suggested that we invite him up to the UP to view the Ship Petroglyph. He accepted the invitation, and last fall took a trip with his wife Sandra during the peak color season, met Bob Wheeler, and got a tour of the "Ship Site." He also wrote a paper from their initial investigation of the site (which now has an official Michigan State Site designation 20KE71. Jack's paper is in Appendix B.

According to Dave Weier, from Madison, Jack was very impressed, and for weeks had his desk at Ripon College strewn with all kinds of books on ships, trying to find a possible match with the Copper Harbor Ship Petroglyph. His paper, entitled "Rock Art near Copper Harbor, Michigan" has been presented at various meetings. Jack has consented for me to share this paper with you, since he cannot be here himself. In early September of this year, he took a bus of people from the Midwestern Geographic Society in the Ripon area to Copper Harbor, and said he cannot afford to make two trips this fall up to the UP. He is even older than I am. I asked him what his secret was for keeping so active and sharp. He said that he has sugar diabetes, and is required to walk 1/2 mile a day. That's how he keeps young. To me, this is a perfect example of how a handicap can become a benefit, if you treat it right.

Jack compared the style of the ship with other images of ancient ships, including the oldest known image of a sailing vessel on an Egyptian vase from 3200 BC, with an Assyrian ship from 700 BC, a Greek merchant ship from 4500 BC, a Roman merchant ship from about A.D.1, and with Egyptian sailing vessels from 1250 BC and 1500 BC. I will present results of surveying data which Susan English, Ritchie Brown, Jay Mullins, I, and some other surveying friends collected years ago, which will narrow the possibilities down, I think to the age of the so-called Minoans.

The people we know as Minoans developed on the Greek island of Crete, with probable association with the Anatolians from Turkey (on the ancient water ways). The Minoans are known for having been primarily a trading people, and they traded metals such as tin and ox hide ingots of copper. They developed a pictographic writing system known as Linear A, symbols of which can also be found in the few remaining Mexican codices, which the book-burning Christian monks did not get when they came to the New World in the AD 1500s and 1600s. What is known as the Minoan culture on Crete began to take form from farming communities in about 3500 BC, when they also began to develop trade and manufacturing centers.

By about 2700 BC, the full-blown culture known as the Minoans had developed. We call them that because of the Greek legend of King Minos, and his love for gold. Researchers thought the culture we call Minoan must have been associated with his realm. Without doubt, they were known in various ancient foggy legends by other names, probably also including the "Sea People" or the "Atlantians", who sailed through the Pillars of Hercules into the Atlantic Ocean. The so-called Minoan culture lasted until about 1500 to 1600 BC, when evidently violent earthquakes and volcanic eruptions drastically weakened their empire. These movements of the earth destroyed their settlement on the island of Thera (which exploded and sank) and likely devastated their other coastal cities and fleets in the Mediterranean Sea. They were replaced by the Mycenaean Greeks, and possibly invaders from Anatolia (Turkey). Wars from this period of time can be sensed in the old poems of Homer, which were put to writing in the Phoenician alphabet by the Classical Greeks, once they learned how to write using this new alphabet in about 700 BC.

The water levels in ancient times indicate that the outcrop where the Ship Petroglyph is located would have been an ideal harbor from about 3300 BC to 2600 BC. (Appendix C) This covers the early part of the active sea travel of the people we know as the Minoans, and a time when ancient water levels would have made it possible for ships to sail up the Mississippi River and to the area near Copper Harbor, without any portaging. For various reasons, I will compare the outcrop where the Ship Petroglyph is located to another outcrop which Prof. Steinbring and his volunteers have studied in depth--an outcrop which also has petroglyphs. It is known as the Hensler Site near Waterloo, Wisconsin, on the Maunesha River, north of Aztalan and Lake Mills.

# Jack Steinbring's Outcrop in Southern Wisconsin, and Rocks which look like Bear Heads:

Prof. Jack Steinbring and his colleagues have been excavating through a foot or so of loess (wind blown rock flour from the last glacier period) on a small part of the top of a prominent outcrop of rock known as the Hensler Site. He has recovered ceremonial points (apparently offered there) from as early as 8500 BC, and other evidence that the site had been continually used for ceremonies until at least AD 900 to AD 1200.¹ Jack requested that we survey the site for him, which we did. As expected, we found how features on the outcrop could be used as a solar calendar. The key forward point (where a person with a tall pole could have stood) is a pothole "ground" into the bedrock, about 2 feet deep. It is very noticeable when you are near it. The extreme rear observation points where a person would stand to view the setting sun over the pothole on the winter solstice and the fall and winter cross quarter days² are marked with out-of place boulders. To me, they look like the heads of a bear (similar to other rocks we had found in the UP of Michigan, which bring to mind the image of a rabbit, bear, wolf, etc. See Scherz, 2009). The area where Jack and his volunteers have been finding their ceremonial points would also have been along the alignment for the winter solstice sunset.

From a deformed tree at the site, corresponding to an Indian marker tree, pointing to where Jack has been excavating, I believe that the site was maintained by the Bear Clan of the HoChunk into the last century. Indian traditions indicate that the Bear Clan was responsible for maintaining old sites and for constructing the marker trees associated with them. The chiefs of the tribe, years ago, came from the Thunderbird or Eagle Clans. At a program for the Pow-wow of the HoChunks living in Nebraska in July, 2013, it was said that the ancient Fish Clan were the engineers of the tribe, and that they oversaw the layout and construction of the effigy mounds (of Wisconsin, etc.).

Which we honor as Halloween and Groundhog's Day.

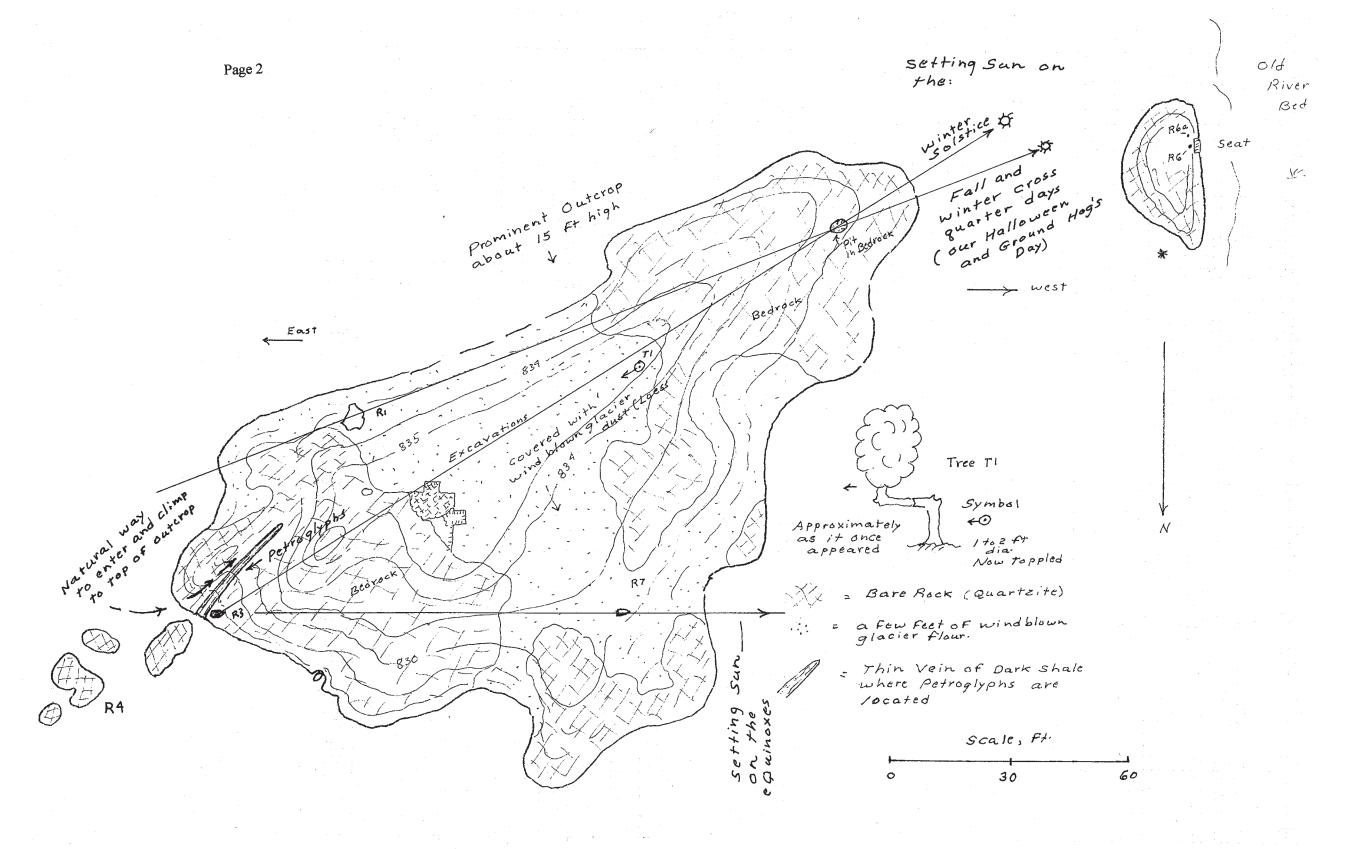


Figure 1. The Hensler Site, in Southern Wisconsin

\* Note natural Shape of the "Crooked Mountain Symbol"

On the extreme west edge of the outcrop (known as the Hensler Site) where the east bank of the ancient river would once have been, is a hollowed out area about as large as a couch, either natural or modified by man. It is on a small island of the natural bedrock, in the shape of what I refer to as a "Crooked Mountain Symbol". This seat would have worked nicely for a teacher and a few students to sit as they watched the setting sun. Above this teaching bench is a prominent rock, completely out of place, which without question brings to mind the head of a bear. See Figures 2 and 3. And a few feet south of this perched rock is another small natural rock, about 5 inches long and about 3 inches high, resting in plain sight on top of the bedrock. It also, brings to my mind the head of a wolf or a bear (Figure 3a). There are several other perched rocks which similarly bring to my mind the head of a bear. Without doubt, the images of these unusual natural rocks (apparently collected and perched at the Hensler Site) to me, bring to mind the image of a bear's head, and in my mind, the thought of the Bear Clan of the HoChunk, who I have been told were the clan once responsible for the maintenance of ancient sites.<sup>3</sup>

This is important to keep in mind as we consider the images at the Ship Petroglyph Site near Copper Harbor. There is also a stone seat there and another at the Star Chart site in the area.

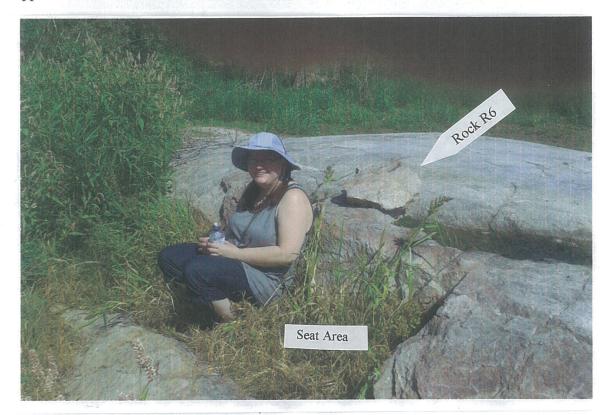


Figure 2. Natural Bench on Far Western Edge of the Hensler Site (Note the out-of-place "perched" Rock, R6.)



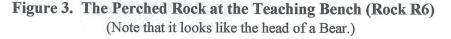




Figure 3a. Another small rock (purposely propped up) which looks like the head of a bear (or possibly a wolf)



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Field Sketch

To approach the ancient ceremonial center at Jack's Hensler Site, we clearly approach it from the east, along a vein of sloping black rock, where the petroglyphs are located. Jack remarked that the natural shape of the outcrop suggested that this vein is symbolic for the reproductive area of mother earth, a concept that is very ancient and world wide for people who once honored the fertility of nature for their well being. When we finished our survey, the entire outcrop can be seen to resemble a rabbit (taken to be an ancient symbol of fertility, and preserved in our culture as the Easter Bunny). The vein with the petroglyphs corresponds to the reproductive area of this giant effigy, and a rock off to the northeast, resembles the shape a small rabbit (as if a newborn rabbit). (Rock R4 in Figure 1.)

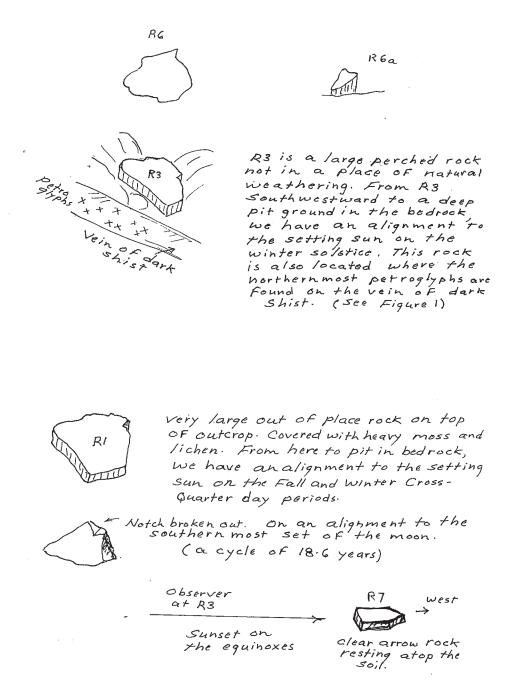


Figure 3b. A summary of out-of-Place Rocks with special shape at the Hensler Site (which bring to mind the head of a Bear, Wolf, or an Arrow)

#### The Outcrop where the Ship Petroglyph is Located:

The outcrop of the Hensler Site is most easily approached from the east end, along a dark vein of rock which has numerous ancient petroglyphs pecked into it. The first thing I noted when climbing this outcrop from its eastern end was a large out-of-place rock which reminded me of a bear's head. (See Rock R3 in Figures 1, 3b, and 4.) When I got to the top of the outcrop, there was another rock, larger, and also not where it had weathered out of the bedrock. This other out-of-place rock similarly brought to mind the head of a bear. (Rock R1)<sup>4</sup>

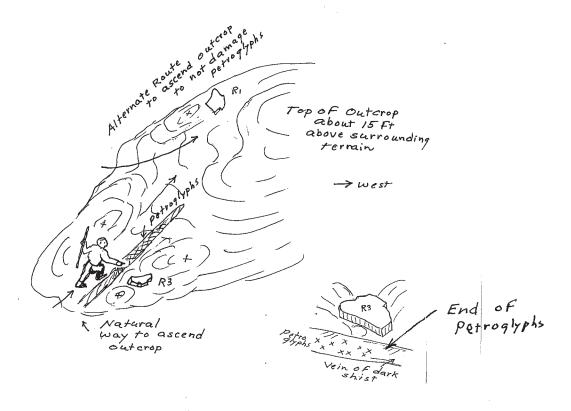


Figure 4.

One naturally approaches the Hensler Site from the east, along the vein of rock with numerous petroglyphs. To the right is an out-of-place rock which reminds me of the head of a bear.

Also at the outcrop where the Ship Petroglyph is located, as I climbed upward from the south east along a natural walkway, there was a clear petroglyph of a bear on the right. No one could mistake this as an image of a bear, whatever such an image signified. See Figure 5. (On the north side of the outcrop is an image of the ship, and on the eastern end of the outcrop is an image of a thunderbird (and some sort of marks which look like writing). See Appendix A.

<sup>&</sup>lt;sup>4</sup> After our surveys, we find that with a flag held in the large pothole to the south west, from R3, one would be able to watch the sunset on the winter solstice over the flag, and from R1, the fall and winter cross quarter days (which we celebrate with Halloween and Ground Hogs Day).

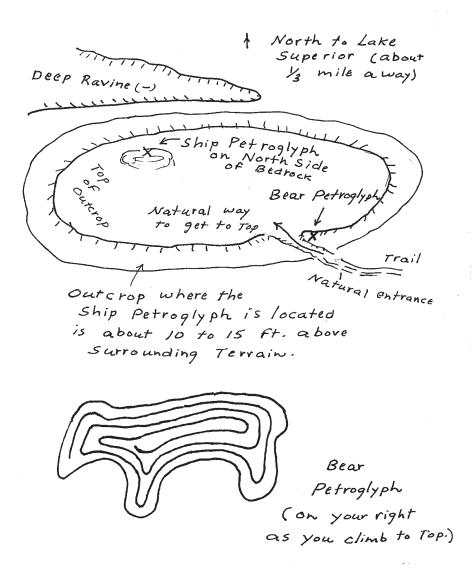


Figure 5. The image of a Bear as one climbs to the top of the outcrop at the Ship Site

Like the outcrop at the Hensler Site in southern Wisconsin, the outcrop at the Ship Site near Copper Harbor in northern Michigan rises about 10 to 15 feet above the surrounding terrain. Unlike the Hensler Site, on the north side of the Ship Site there is a deep ravine with gravel on the bottom. Rounded gravel indicates that it was once an ancient shore line of the lake when Lake Superior was much higher. This would have been an ideal harbor at one time when the water level was about 60 feet or more above the present level of Lake Superior. (The present shore of Lake Superior is about 1/3 mile to the north.) If the water had been more than 60 feet higher, as from about 2600 BC to 3300 BC, this low area to the north of the Ship Petroglyph would have been an ideal place to dock a ship (a boat slip). See Figure 6.

Also, the area just north of the large stone face on Mummy Mountain, as reported to us by G. Fred Rydhom, would similarly have been an ideal harbor at the same time and at the same water level. See Figure 12. At Mummy Mountain during the high water stage, there would also have been an island in the shape of what I call the Crooked Mountain Shape or Crooked Mountain Symbol (from the Mexican Codices) in a harbor just to the north.

On this island (now on dry land in the Huron Mountain Club) were also four large earthen mounds. In the eastern United States, they would be called Adena Mounds. A similar large mound can be found near Skanee, Michigan. Another is east of Mauston, Wisc., which is said to have been constructed long ago by the ancestors of the HoChunk (or Puon or Punt) Indians. A team of HoChunk technicians, with their ground penetrating radar unit, visited the mounds on Huron Mountain Club and declared that there are large metal targets in each of the mounds. These mounds have not been further investigated. (Scherz, July 1999, Figs. 11 and 12)

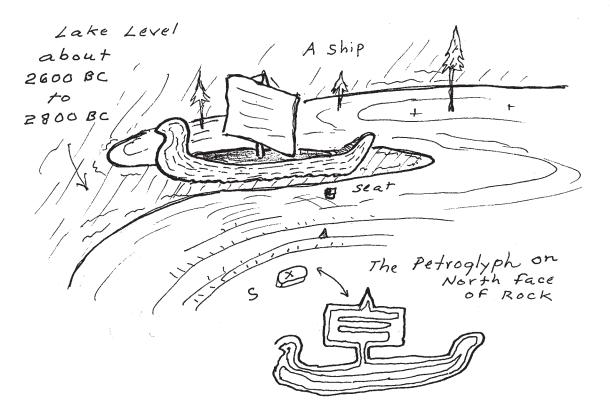


Figure 6. Deep Channel north of the Ship Site and water levels before about 2600 BC

#### Our Survey of the Ship Site:

My initial sketches of the Ship Site, when we were first shown it in 2008, are in Appendix A. We were led to the site by David Hoffman, at a meeting of the Ancient Waterways Society, hosted by Susan English. The petroglyphs are on an exposed outcrop about 15 feet above the surrounding terrain. And to the northwest is a deep visible ditch which drops off to lower terrain to the northwest. I naturally wanted to know if and when the ancient shores of Lake Nipissing would have been in this ditch. It would have provided a perfect protected slip to anchor a boat at one time. I was also interested in the precise relative location of the petroglyphs on top of the outcrop, as well as what appeared to me to be natural stones of particular shape. They appeared out of place, likely collected from elsewhere and brought there for a purpose. A precise local survey of the outcrop and immediate terrain would be in order. If this were done with sun shots to determine true north, then the precise results could also be used for examining possible astronomical alignments for use as a possible ancient calendar site.

To get accurate sea level elevations for our survey, so we could determine when the ancient waters of Lake Nipissing would have been in what appeared to be an ancient boat slip just to the northwest of where the ship petroglyph, we needed to tie to some points with reliable elevations, related to Mean Sea Level (MSL). A traverse to the present shores of Lake Superior would have been extremely difficult through the woods and rugged terrain. Instead, we chose to traverse down a nearby dirt road for a hunting camp to a point which is indicated on the USGS topo maps as a photo control point, which I considered would be accurate to the nearest foot. This was done, and we got some elevations for our map based on MSL. We could compare the bottom of the deep ditch north of the outcrop, to the present level of Lake Superior and see if we could determine when the waters of ancient Lake Nipissing would have been in the ditch.

Figures 7 shows the results of our survey efforts. Figures 7a and 7b show larger scale portions of the map in Figure 7, where you can better read the writing.

Figure 8 shows some of the prominent rocks on top of the outcrop which to me seem out of place and were likely selected elsewhere for the image they brought to mind, and brought here for some purpose. Figure 8a shows the rest of these special rocks atop the outcrop at the Ship Site which I sketched, as well as a stone seat at the Ship Site compared to stone seats at the Hensler Site and at the Star Chart Petroglyph Site (also in the UP). Many of the special rocks atop the Ship Site bring to my mind the image of the head of a bear, as similar rocks atop Eagle Rock brought to mind the head of a wolf. See Scherz, 4 April, 2011. I later learned that

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the Eagle Rock outcrop was known in ancient native lore as the "Home of the White Wolf", important in the traditions of various native tribes.<sup>5</sup>

# Rise of Ancient Beach Lines Relative to Present Level of Lake Superior:

To calculate the ages of the ancient beach lines around the Ship Site, we used the reports produced by Curtis E. Larsen of the United States Geological Survey (USGS) written 1985 to 1994. Since the late 1800s, scientists have been struggling with the mysteries of the elevated old beaches around Lake Superior. They are most high on the north side of the lake and less so on the south side. The rate of uplift of the crust of the earth after the melting of the last glacier (isostatic rebound) is highest in the north where the last remnants of the thick glacier were located. Radio-carbon dating, when it became available, was key to unraveling the mystery.

Larsen has reported on the results of decades of work on this problem. Figure 9 illustrates one of the charts by Larsen (1987) on the <u>present rate</u> of uplift of the earth for different areas in the upper Great Lakes. There is a correction factor between <u>present rate</u> of uplift and the <u>mean rate</u> of uplift back to an old beach of interest. One can get a ball park date from the data shown in Figure 9, by simply dividing the height of uplift (above present Lake Superior) by the present rate of uplift. But for the precise work we are interested in, we also must determine the correction factor between present rate of uplift and mean rate of uplift.

Correction Factor = Mean Rate of Uplift / Present Rate of Uplift.

Appendix C shows how this correction factor was determined for the area of the Ship Site near Copper Harbor. The dates assigned to the old shore lines given in Figures 7, 7a, and 7b are based on these charts given by Larsen (such as Figure 9) and the data which can be gleaned from Larsen's reports for determining the correction factors.

We found Eagle Rock with the help of Fred Rydholm, who asked Ritchie Brown and me to check out any man-made cairns, etc., atop the outcrop near his camp. We found organized cairns and rocks which looked like heads of wolves. And I met a lodge member of the Ojibway tribe on site who said that the location was known as the "Home of the White Wolf" in their lodge traditions. Previously, the Cheyenne elder, Ralph Redfox, asked us to precisely survey the organized rocks at the Bighorn Medicine Wheel in Montana. He said that sites, important in his ancient verbal histories, east of the Mississispi River had been encoded between several of the northern cairns of this wheel. He had been long looking for these sites and could not find them. He asked our help. With volunteers, we surveyed the wheel and got the alignments, which I put into a file for reference. Ritchie, who had attended several of Ralph's New Year's ceremonies, knew that the white wolf was part of the rituals. So we checked the location of Eagle Rock to see if one of the alignments passed through it. It did. We told Ralph and showed him our maps of Eagle Rock. He wanted to see it. With some HoChunk as hosts, he did visit this out-of-the-way outcrop and proclaimed that it, indeed, was the main ancient ceremonial site of various tribes, which he had been long looking for.

Map of Outcrop where The Ship Petroglyph is located near Copper Harbor, Michigan, from Field Surveys in Fall of 2009

By Susan English, Ritchie Brown and Jay Mullins, working under the direction of James P. Scherz.

Field Techniques: Total Station Field Instrument, controlled by Sunshots. Survey Tapes Purposes of the Survey: (1) Carry in Sea Level Elevations from were stretched between surveyed points, and extended level rods were used to sketch a distant photo Control point so that our contour lines would be in features of interest onto grid papers, which were transferred to the base map by Level of Lake Nipissing in about 2600 BC. use of a Light Table. mean sea level (in Feet). (2) Determine the shape of the outcrop 660-Lake Level about 2500 BC where the petrogly phs are located, 662 Ft.4. 2600 BC 666 TT Lake Level about 2900 BC and locate where they appear on 664 ft Lake about 2800 BC the outerop. (3) Define the shape and elevations of the visible deep ditch just Northwest of the outcrop. (4) Carefully examine any apparently out - of - place rocks on top of the outerop. Use apparent arrow-Shaped Rocks and rocks which bring to mind animals, such as the numerous wolf-head shaped rocks atop of Eagle Rock, Mich., which we later learned was Small. known as the 'Home of the wet weather white wolf" in native traditions. (See 'Survey Report for Eagle → To a Lake Rock" by Scherz, 4 April, 2009.) 2 3200 BC (5) Defermine the shore line of ancient Water ∖୍ ବୃଦ୍ଧ (ଜୁଆ 3200 BC Lake Nip issing (about 3300 BC to about 1500 BC) when it would have been possible to sail ocean-going boats from the Gulf of Mexico, up the Mississippi River, then through what is now the chicago Ship Canal and to harbors in this area. Example of calculating an ancient beach: Level of Lake Superior from Fort Wilkins 72 Minute Quadrangle, 1949 = 602 Ft, MSL Near high water When would water level be at the 662 of Lake Nipissing ft. level? From present rates of isostatic about 3200 BG adjustment published by Larsen in 1987 (usgs) Beach we get the rate of rise in this area at about Rock Guterop about 10 to 15 Ft. 1.2 ft./century. - Rise of water = 662-602 ft. Legend: - 680 = Contour Line in ft, MSL = 60 ft. 679.7 = Old water Level of Lake Nipissing We calculate as follows: at about 2600 BC. 60 ft. /1.2 ft. /centary = + 6873 = Survey Point with elevation, (2) = Rock 3A. Tall 50 centuries or 5000 years before now. Assuming Do = Special rocks Surveyed. D., DR81 = Special Rocks with details given. 402000, we have + 681.5 = Location of Bear, Ship, and Thunderbird Petroglyphs. 5000 yrs - 2000 AD 3000 BC. \* -= Stream when we surveyed; === , === = Trails (approximately) But this according to Linear Math. True Isostatic Rebound follows more of an exponential math. With refine ments, we get a mean rate of uplift of 1.3 ft/century This gives 60/1.3 = 46 centuries (4600 yrs Map Sheet: old Beach Ship-F1 ago). This is about 2600 BC, the date I Scale, Feet assign to the 662 ft. contour line. James P. Scherz Figure 7. Our map of the Ship Site 19 Sept. 2013 (Also see Figures 7a and 7b.)

Map of Outcrop where The Ship Petroglyph is located near Copper Harbor, Michigan from Field Surveys By Susan English, Ritchie Brown and Jay Mullins, working under the direction of James P. Scherz.

Field Techniques: Total Station field Instrument, controlled by sunshots. survey Tapes

showing the top of the Ship Site outcrop

were stretched between surveyed points, and extended level rods were used to sketch features of interest onto grid papers, which were transferred to the base map by Level of Lake Nipissing in about 2600 BC use of a Light Table. 660-Lake Level about 2500 BC 662 Ft. 4 2600 BC 666 ft Lake Level about 2900 BC 664 Ft Lake about 2800 BC 665.3 Grave/ Dirt Road culvert Small Stream in wet weather Jo a Lake ≈ 3200 BC 670 . ~ 3200 BC Near high water of Lake Nipissing about 3200 BG old Beach Rock outcrop + 680.5 Legend: about 10 to 15 Ft. - 680- = Contour Line in Ft, MSL 679.7 = Old water Level of Lake Nipissing at about 2600 BC. + 683.0 + 6873 = Survey Point with elevation, (1) = Rock 3A. Tall A 0 = Special rocks Surveyed. PNT R81 = Special Rocks with details given. P. S. C = Location of Bear, Ship, and Thunderbird Petroglyphs. == Stream when we surveyed; === , === = Trails Figure 7a. Larger scale version of the western portion of the map in Figure 7,

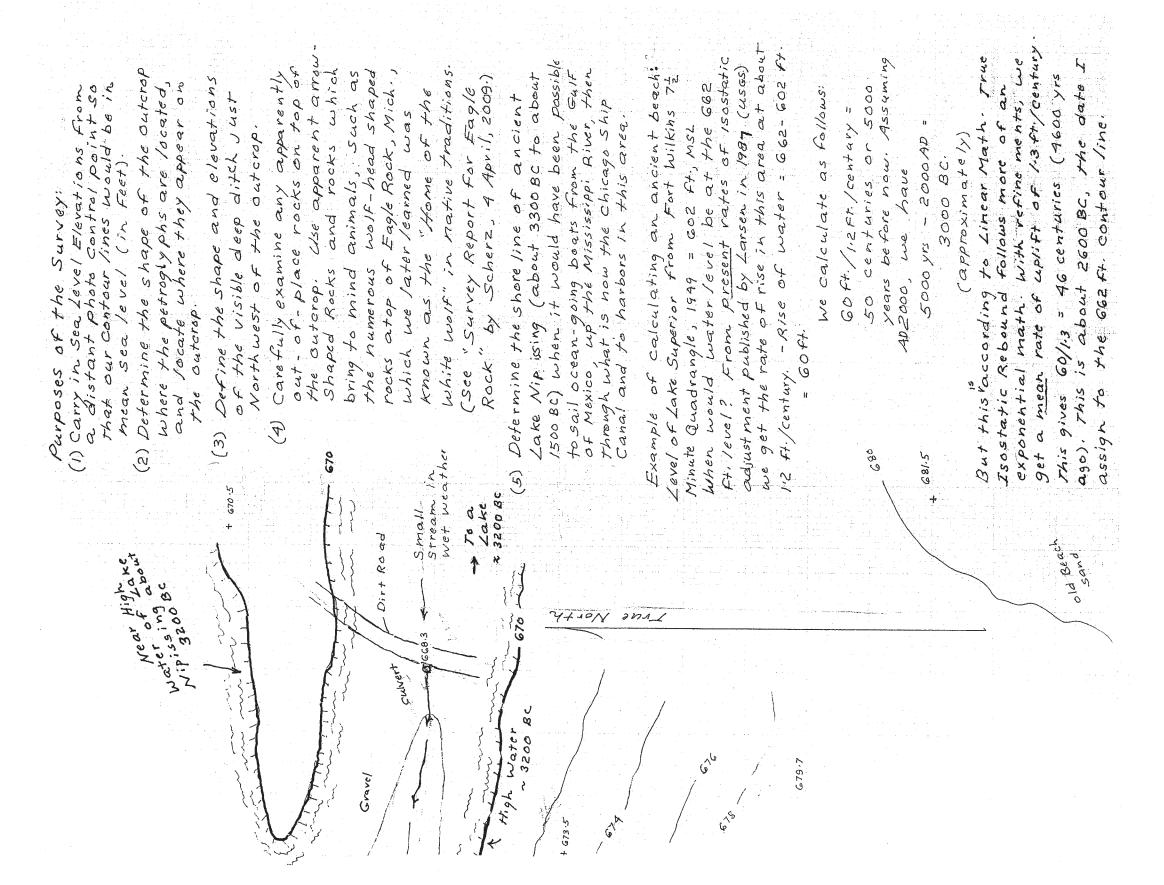


Figure 7b. Larger scale version of the eastern part of the map in Figure 7



Figure 8. Some of the seemingly out-of-place rocks atop the outcrop at the Ship Site

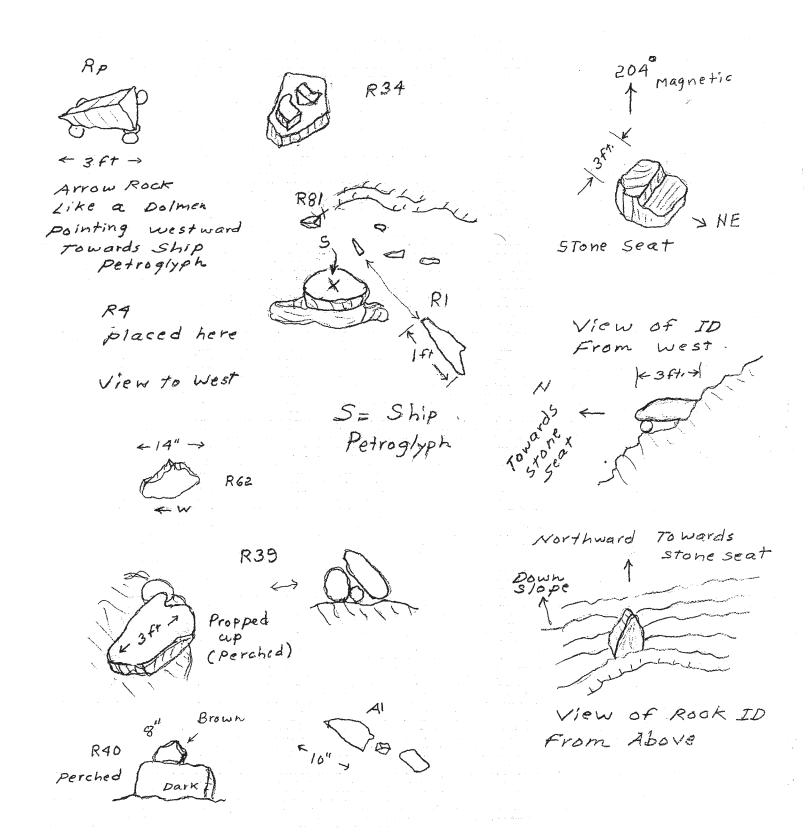


Figure 8a



Stone Seat at the

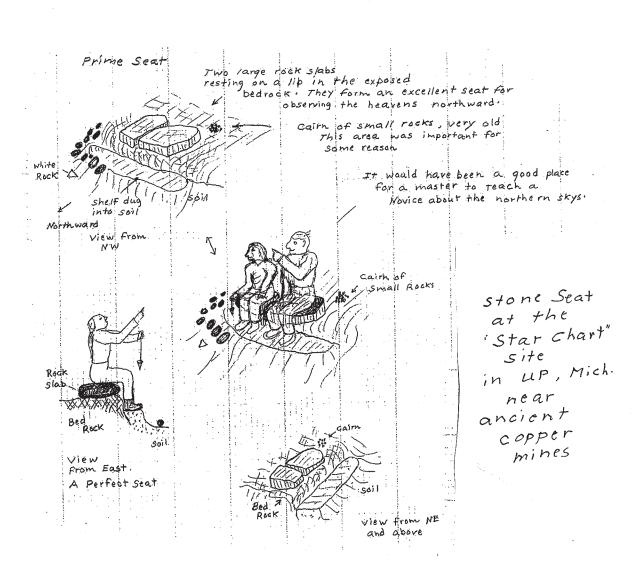
#### The Stone Seat and Pointer Rock RG on Feature RSW

The stone Seat would serve as a teaching seat as with similar seats at other ancient sites, such as the Star Chart Petroglyph Site near the ancient Copper Mines of Lake Superior.

Stone Seat at the Hensler Site







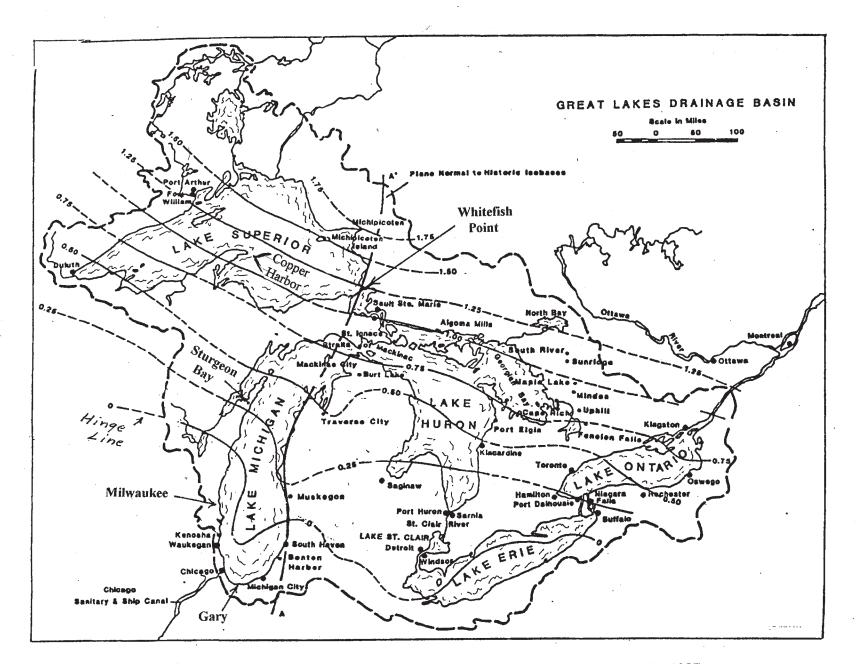
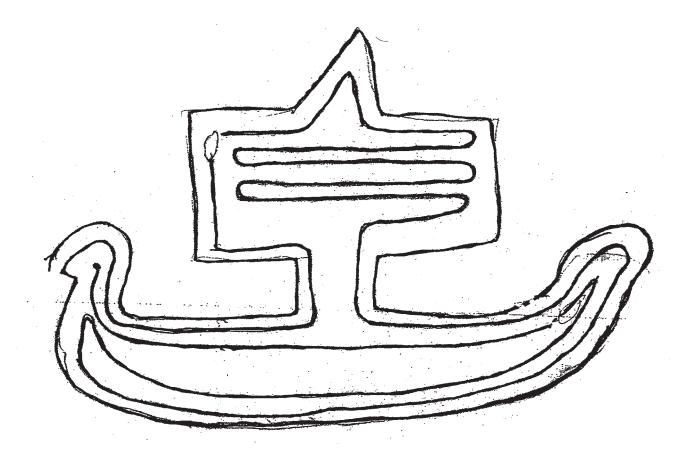


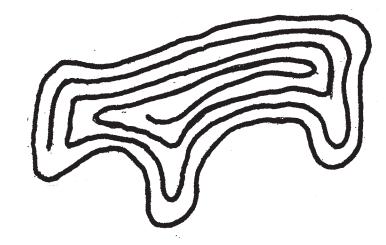
Figure 9. Chart of present rates of isostatic adjustment published by Larsen in 1987.

--(Modified from Larsen, 1987, p. 11; U.S. Geological survey Bulletin #1801)--

# The Art Style of the Petroglyphs at the Ship Site is Special.

Both the ship and the bear petroglyph at the Ship Site are constructed by a continuous line drawing, like a labyrinth. This is rather unique, but can also be seen in the art from objects taken from Adena mounds in the Eastern United States. See Figure 10.



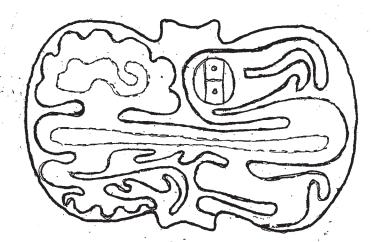


Berlin Tablet

"abstract bird incised"

from

Vinton Co., Ohio



Example of continuous line art on an Adena tablet

Figure 10. Labyrinth Art Style at the Ship Site and in Adena Art

## The Ship Petroglyph Site Would have been an Ideal Ship Harbor before about 2600 BC.

At the time of the Norse (about AD 900 to AD 1200) the harbor where the Ship Site is located would already have been up on dry land. At that time, the water level would have been about 11 to 14 feet above present level. (contour lines of about 613 to 616 ft.) The shore line would have already been 1/4 to 1/3 of a mile to the north. The outcrop by the Ship Site would not have served as a ship docking area at that time. But it would have been an ideal ship slip from about 2600 BC to 2800 BC. And it would have been a good place to anchor a ship from about 3300 BC when the Chicago Ship canal area opened until about 2600 BC. This is all too early for when the Phoenicians were at the height of their power (about, 1200 BC to 400 BC).

Present
Shore line of
Lake Superior
about y3 mile

S = Ship Petroglyph C = Thunder bird Petroglyph Lake Level about P= Bear Glyph 2600 BC Rp = Dolmen Arrow Rock 3ft-long pointing due west RK3 = Arrow Rock pointing East. Rp and RK3 create an equinox sunrise and sunset alignment The natural docking area near the Ship Site (2600 to 3300 BC) would have been an

The natural docking area near the Ship Site (2600 to 3300 BC) would have been an excellent place for people we call the Minoans (from about 2700 BC until about 1600 BC, and possibly as early as 3500 BC--see page 1). The natural boat slip near the Stone Face at Mummy Mountain would also have been an ideal site for ships at the same time.

The natural protected harbor (through an unusual eroded dike in the bedrock, near the Old Fort Site on the north shore of Lake Superior would also have provided an extremely desirable harbor at the same time. However, the old stone fort, itself could not have been constructed before about 1800 BC. Following figures will give data and details. <sup>6</sup>

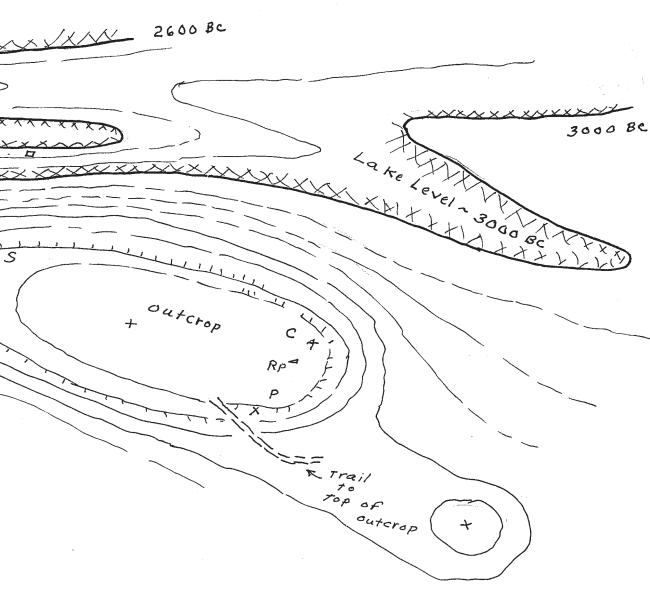


Figure 11. Water Level near Ship Site in about 2600 BC to 3000 BC

The ancient Stone Fort on the north shore of Lake Superior and the Pequaming Site are tied together by long range alignments. The most prominent astronomical alignment at the Pequaming Site is to the rising sun on the summer solstice. Follow this direction across the lake, and you come to Otter Head Island, where the Ancient Stone Fort is located. But the main features at the Pequaming Site are only about 10 to 12 feet above the present level of Lake Superior. It could not have been built before about 900 AD to say AD 1300. It could have only served for the Norse, or other people after about these dates.

# Other Naturally Protected Ancient Harbors around Lake Superior during the Ancient Copper Mining Era:

The area we call the Ship Site would have been a natural protected harbor in about 2600 BC to 2800 BC, and could have been used as a good docking area earlier from about 2400 BC to 3300 BC. With the help of Fred Rydholm, Ruth and Norb Schmitz, William Wenzel, Robert Patenaude (geologist) and others, we had previously surveyed at least two other sites which could have also provided excellent protected boat slips at the same period of time.

#### Mummy Mountain Boat Slip:

This is located on the land of the Huron Mountain Club, below what is known as Fred Rydholm's Stone Face on Mummy Mountain. It is associated with organized rocks which could have served as a sunrise calendar from the fall equinox to the fall cross quarter day, and on to about 15 November (Figure 12b).

In about 3000 BC, this large stone face, resting on a flat eastern bench of bedrock on the east side of Mummy Mountain, would have overlooked the waters of Lake Nipissing. From it, one could have viewed an island where there would have been four large earthen mounds. Figure 12 shows the ancient shore line, an ideal protected harbor just to the south of the Stone Face, and the location of the island and the mounds.

Figure 12a shows Fred Rydholm contemplating the unusual large perched boulder, which from the south clearly looks like a giant human face. Figure 12a also shows a view from west of the Stone Face looking eastward towards where ancient Lake Nipissing would have been located and the one-time island on which were the large earthen mounds.

Figure 12b shows our map of the large earthen mounds and how they could be used (if there were no trees) as a sunrise calendar in the summer months from the summer solstice to the summer cross quarter day of about 2 August (still honored in England as Lamma's Day) on until about 22 August, one month before the fall or autumnal equinox (on 22 Sept.).

Figure 12 c shows how the special and apparently man-placed rocks near the Stone Face can be used for a sunrise calendar from precisely on the fall equinox to the fall cross quarter day period (about 31 Oct., which we preserve as Halloween) and on for another fortnight to 14 November, a good time to leave this area, if you were traveling by boat.

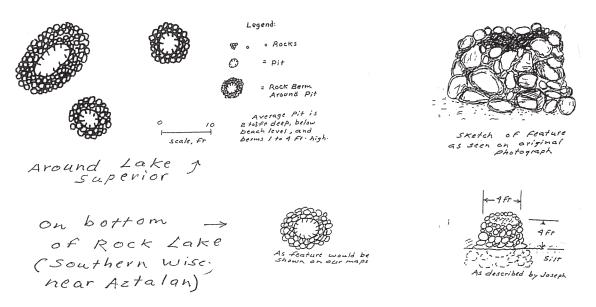
#### The Old Fort Site on the North Shore of Lake Superior:

On the south shores of Lake Superior, most beaches have sand adjacent to the exposed bedrock. However, on the north shores of Lake Superior, there is no sand or glacial till, which had been stripped away by the glacier. There, one finds very few places to beach a boat, and the beaches that are available are of cobblestones, rather than sand or other earth. But in this area, we do find organized rocks associated with special cobblestone beaches. One of the most unusual which we have seen are the cobblestone beaches associated with what we call the Old Stone Fort. Figure 13 shows our sketch map of the area, and a map of the Old Stone Fort, which we surveyed in considerable detail with the equipment we had at the time.

All those in our party who helped survey the site were impressed by a deep eroded vein or dike in the bedrock near the ancient fort. The cleft left by this eroded vein is very deep and long, and about ideal for a very protected boat slip when the water had been higher and connected the Old Fort to the lake. I can think of no more ideal place to dock a boat on the north shores in ancient times, especially during strong northwest winds which blow in this area.

From the charts of Larsen, we were able to calculate that, indeed, that ancient water levels would have been at the edges of the Old Fort in about 1800 BC. See Figures 14, 14a, and 14b. Before 1800 BC, the area of the Old Fort would have been under water, but the protected harbor would have been there from as early as about 3300 BC, the high water time of Nipissing I Stage. Over the centuries, the water level dropped, leaving the Old Fort far from the present beach line. This is an impressive site in that there is a continual progression of the elevated cobblestone beaches from the present level of the lake, right up to the edges of the Old Fort.

On these old beach lines are some of the locally famous Pukaskwa Pits, shown in these figures as Pukaskwa Pits I and Pit II. These could not have been built before about AD 1300 and AD 100, respectively. Of course, similar structures further south would have been long ago destroyed by enterprising treasure hunters, such as the famous rock barrels at Pequaming, Mich.. Local officials who should have made efforts to protect these features, did not act. Some similar structures still exist on the bottom of Rock Lake (once above water before the dam was constructed in the 1840s and doubled the size of the lake). On the bottom of Rock Lake, such fragile structures are still protected by the turbid water, except now for SCUBA divers who have photographed and written about them. Frank Joseph in the 1990s tried to get the state archeologist to declare some rules to protect them. But the reply was that they were obviously made by the glacier, since Indians did not construct things below water. Without rules to the contrary, they too, run the risk of destruction, like those at Pequaming Point photographed in the 1920s, and toppled by 1980. One has been reconstructed by the son of the present land owners, Pete and Pat Carmody. They were rebuilt using earlier photos when the area was a picnic grounds on land once owned by Henry Ford.



Pukaskwa Pits and Similar Structures at Pequaming, Mich., on bottom of Rock Lake (in southern Wisconsin)

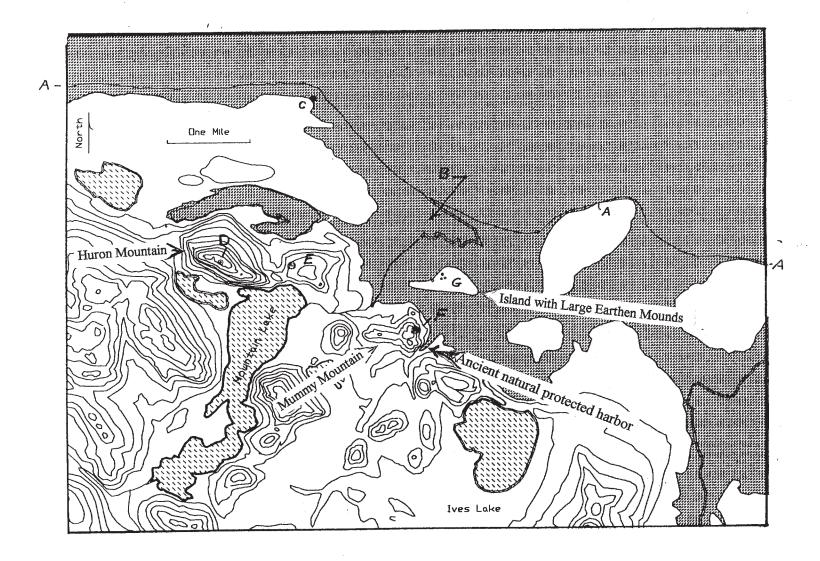


Figure 12. Protected harbor area near Huron Mountain during Nipissing Lake stage in about 3000 BC.

A= Present level of Lake Superior. B= Huron Mountain Club and Huron River. C = Stone Lion. D = Dolmen atop Huron Mt. E = Approx. location of Stone Seat. F = Stone Face on Mummy Mountain above boat slip-like area. <math>G = Island with large mounds.

A natural protected harbor at this time would have been down below Fred Rydholm's famous Stone Face, shown here as F above, and shown in details in Figures 12a. Feature G was once a special-shaped island. It had large earthen mounds on it, which are now far from the lake. How these mounds could have functioned as a solar calendar during the warm months, is shown in Figure 12b. Organized rocks associated with Fred's Stone Face would function as a solar calendar from the fall equinox, to the fall cross quarter day festivals (our Halloween) and on into the first weeks of November, when it would have been a good time, indeed, for ancient sailors to have left this land for the year. (See Figure 12c.)

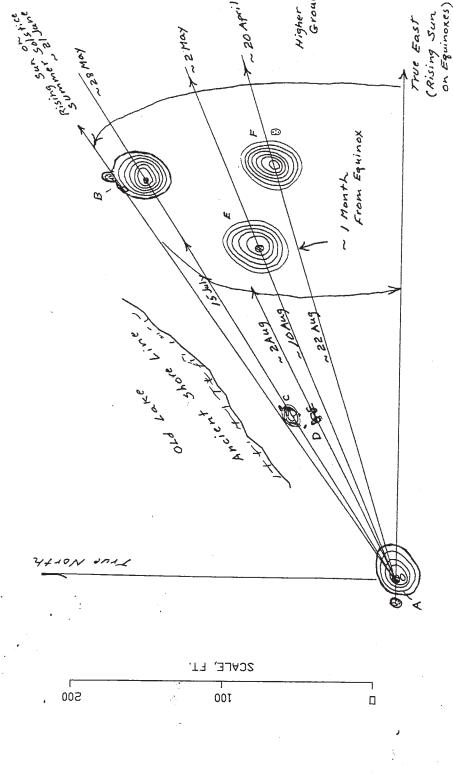


Large perched rock on Mummy Mountain (the Stone Face) shows a clear human face when viewed from the south (apparently the prime direction intended for the viewer)



View seen from behind the Stone Face (Feature F) towards the northeast. The Stone Face seems to be gazing over a swamp towards higher ground about a mile away, where some large earthen mounds are located. They were once on an island (Feature G in Figure 12).

Figure 12a. Fred Rydholm and the Stone Face on a flat eastern bench of Mummy Mountain (shown in Figure 12 as Feature F)



Higher Ground

Figure 12b. Map of large earthen mounds on island G northeast of Stone Face (in Figure 12)

(Edges of mounds and approximate 1 ft. form lines are shown, along with prominent rocks and pits.)

A is a rock within a pit atop of a large mound, the apparent place of observation. B is a large mound with a large rock protruding from its northern end, in shape not unlike a turtle going north (a theme also found in the mound groups in Wisconsin). C is a smaller mound with prominent rocks atop of it. It and rocks atop of mound B define a line along which the sun will rise about one month before and after the summer solstice (when the sun stands still for a few days and reverses its direction of movement on the horizon). Mound F corresponds to there the sun will rise about 1 month after the spring-equinox and one month before the fall equinox (a time when the sun is moving at its greatest speed from day to day on the horizon). E is a pit atop a large mound over which the sun will rise on about 1 May (essentially the spring cross quarter day celebrated as May Day on 1 May). D are large prominent rectangular rocks resembling a ruined crypt. They create an alignment corresponding to about 2 Aug. (essentially the summer cross quarter day, celebrated in England as Lammas Day on 1 Aug.)

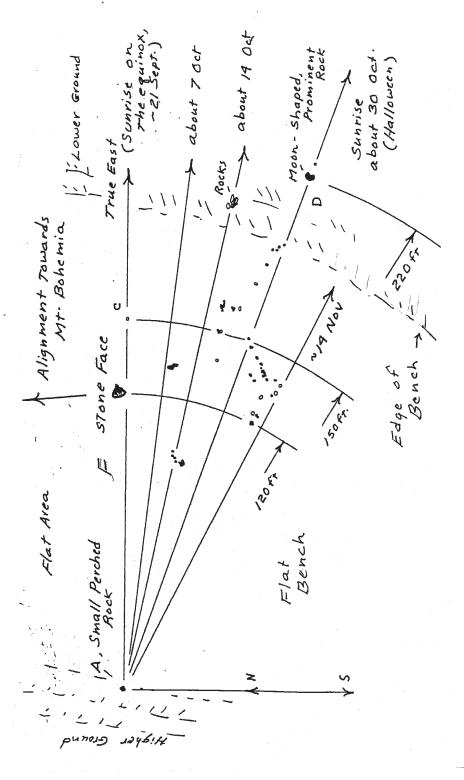
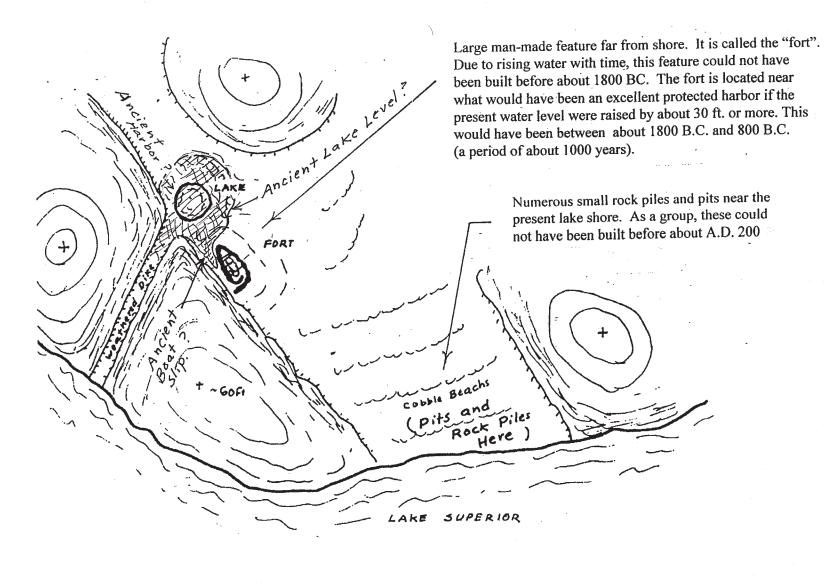


Figure 12c. Sunrise alignments observable in early fall from perched rock west of Stone Face on Mummy Mountain

sumrises, as shown. The longest and most prominent alignment associated with two arcs of apparently man-organized stones, is marked on the end with a prominent moon-shaped rock (D). Pamita said that the crescent moon symbol in earthworks or special rocks meant "Time or Calendar." The sun rises over this line on about 30 Oct. (corresponding to the fall Cross-Quarter Day festivals, which we still honor as Halloween and All Saints Day, etc., and in Mexico as the pre-Columbian festivals of the Day of the Dead). The functional sunrise calendar from point A continues until about 14 Nov., a good time to leave this area for the warmer south, or to prepare to brave the cold and the deep snows which begin to fall within a week or so from then. A = small perched rock on a ledge west of the Stone Face. F = Stone Face. C = small rock directly east of perched rock A. When the sun rises on this alignment (A to C) in the fall and emerges south of the Stone Face, the fall (autumnal) equinox has arrived in all years (even if it occurs near midnight). Other rocks, some obviously organized into arcs, etc., correspond to later sunrises, as shown. The longest and most prominent alignment associated with two arcs of apparently man-organized stones, is

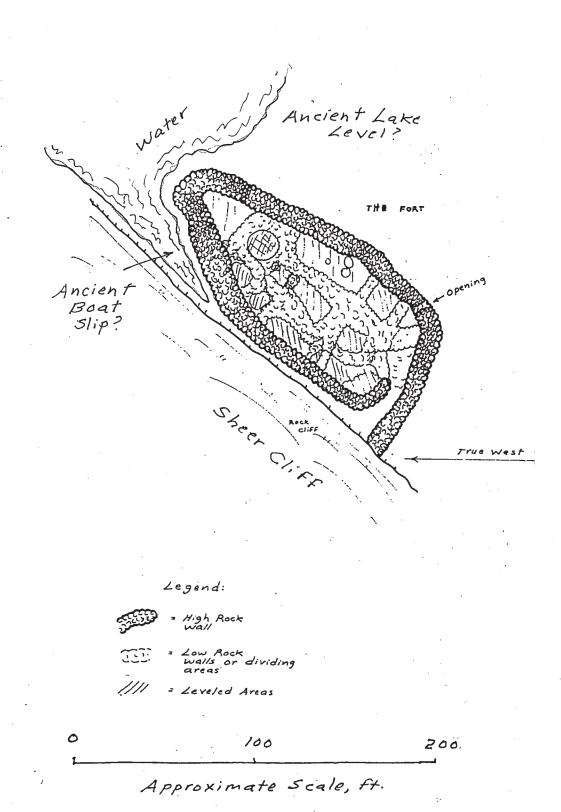


SKETCH SHOWING FORT , COBBLE BEACHES , DIKE , AND HILLS (Approximate only)

Figure 13. The Old Stone Fort on the North Shore of Lake Superior

The main alignment at the Pequaming Site on the south shore of Lake Superior is towards the rising sun on the summer solstice. Follow this line across the lake, and you come to the clear landmarks near the Old Stone Fort. (From Scherz, 6 August, 2000)

--(These maps were compiled in 1985. A recompiled map in 2013 from the original notes, with focus on ancient water levels, is shown in Figures 13a, 13b, and 13c.)--



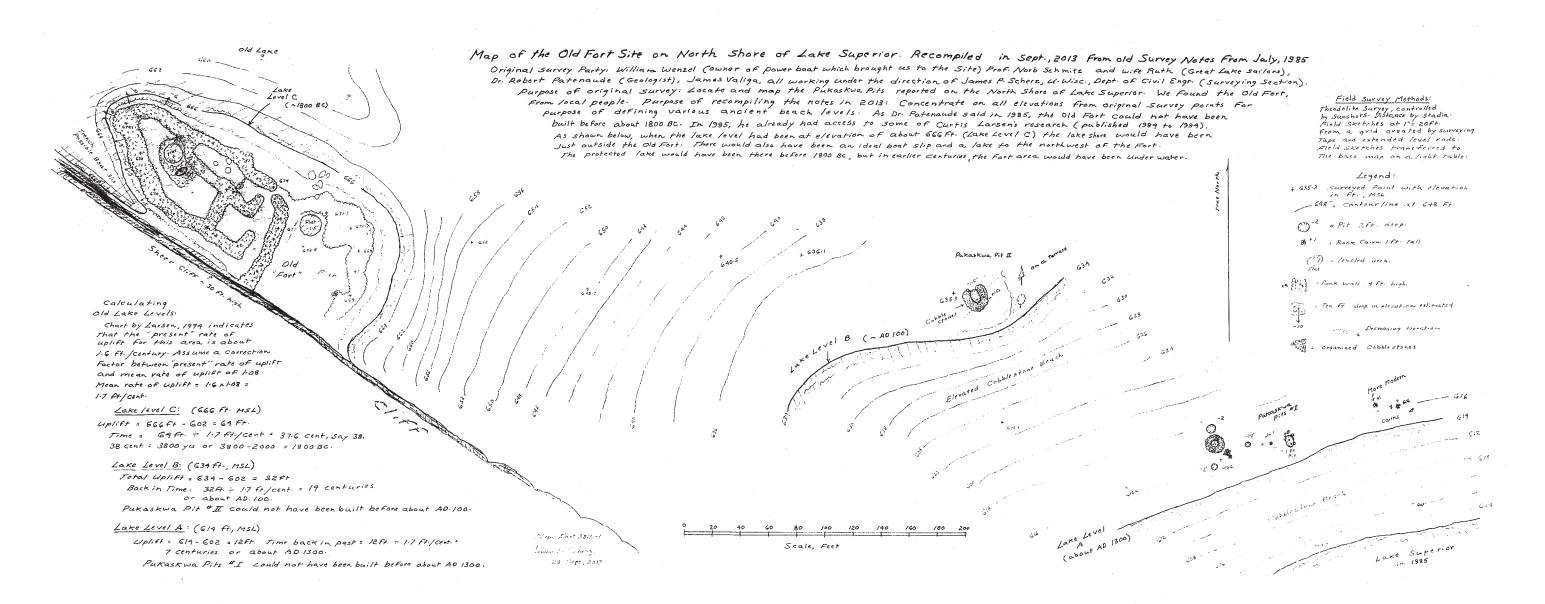
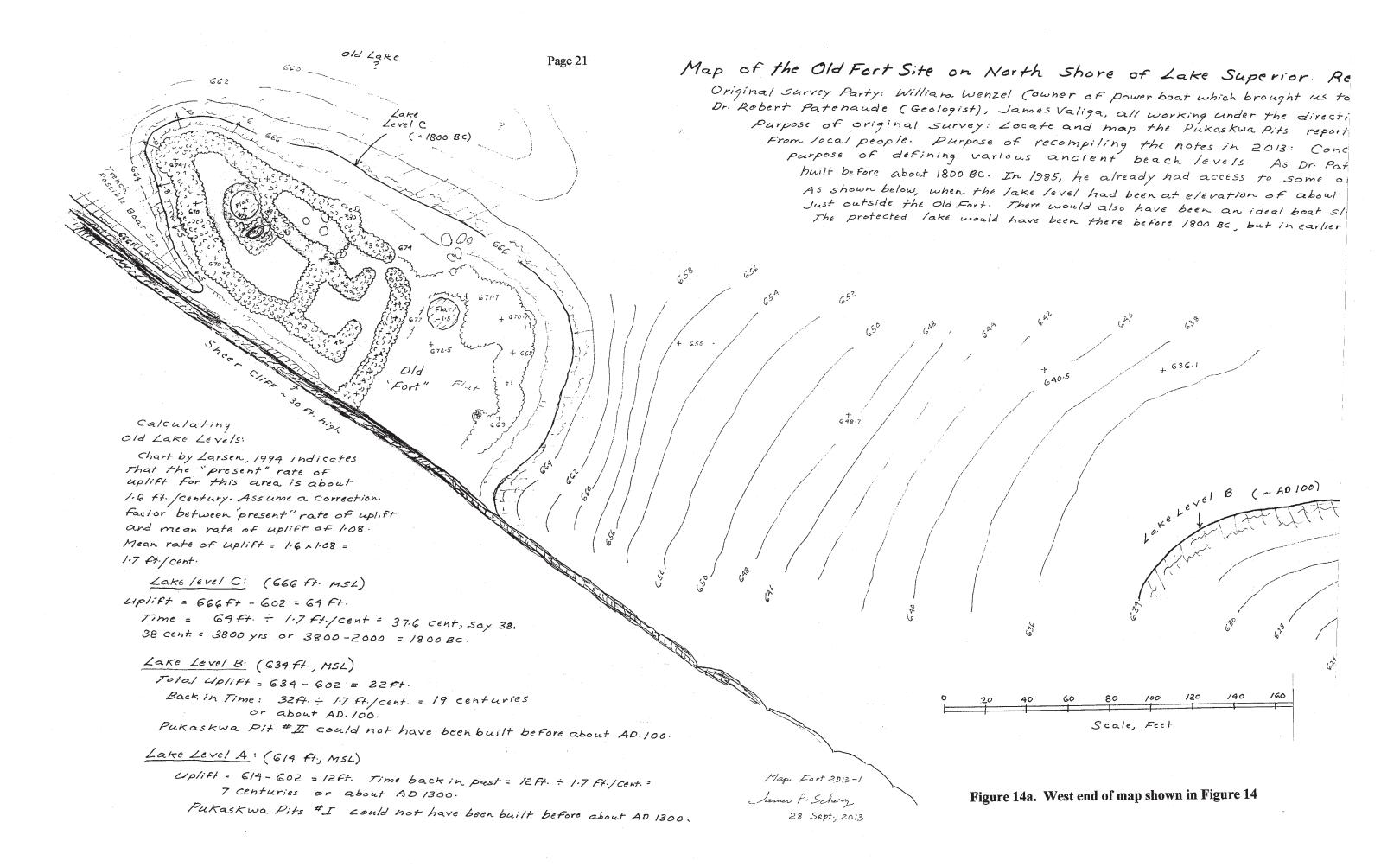
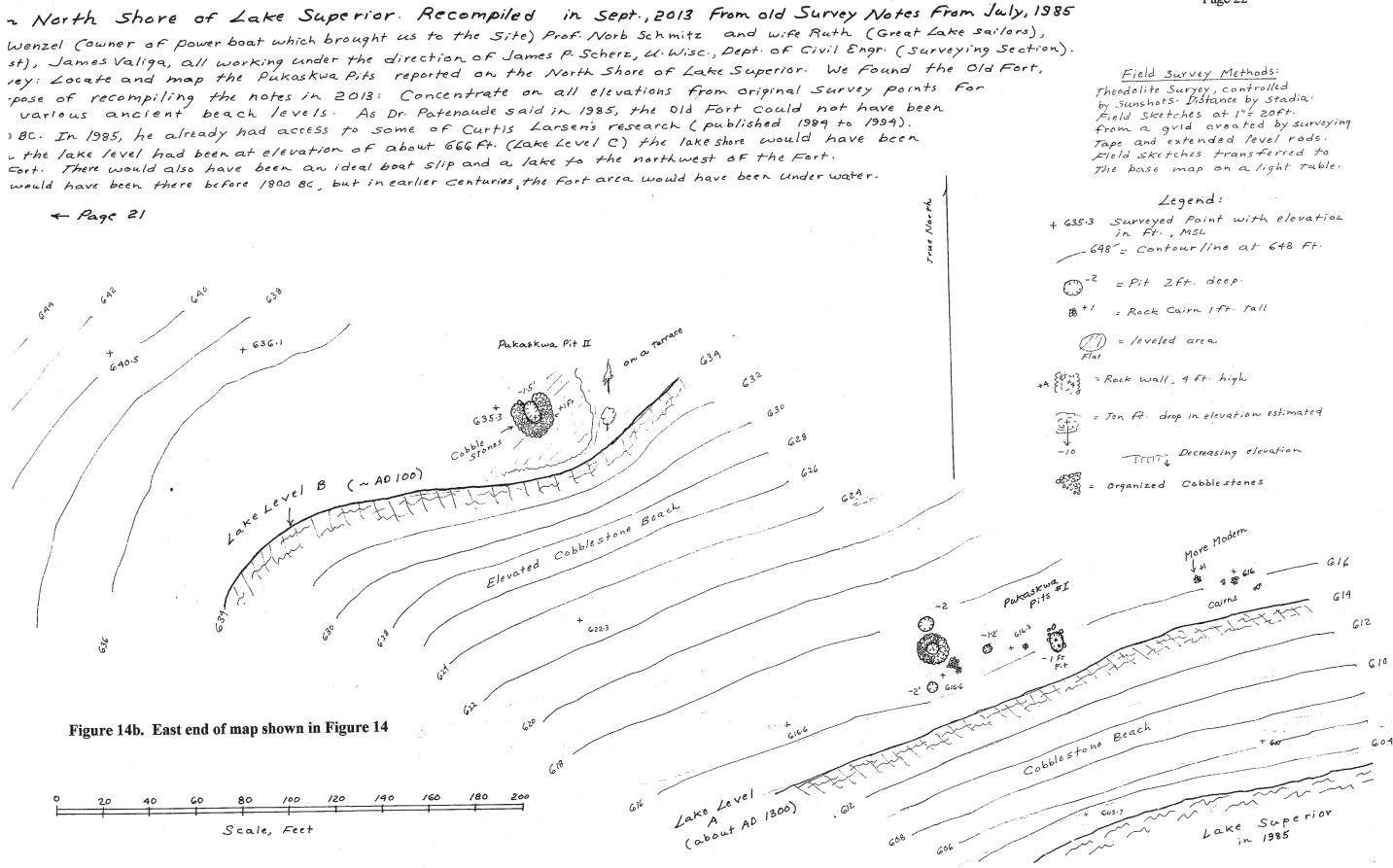


Figure 14. Recompiled Map of Old Stone Fort and elevated beaches between it and the present level of Lake Superior

--(Recompiled in 2013 from original notes, with focus on elevations of all the surveyed points for purposes of lake level analysis)--

Also see Figures 14a and 14b for details.





#### **Changing Water Levels:**

Using the reports of Larsen from the United States Geological Survey (1985 to 1994) we put together the scenario of the changing levels of the Great Lakes from the last glacial period. (summarized in Scherz 2000). As the glacier melted from the south to the north, the initial outlet from the melting ice was to the Atlantic along the river system through North Bay. The French Fur Traders explored into Lake Superior along this same route. But they had to make many portages over a watershed divide, which would not have been needed in about 3300 BC.

The glacier had been about one to two miles thick, a tremendous weight. After it melted, the land slowly rose like a bed will after a person gets up. This is called isostatic rebound. The rising land (relative to the water) gradually pinched off the natural outlet through North Bay, so that it could only be traversed by use of portaging. (The ancient water scar from the earlier outlet, still is there, and streams run in it yet today.). The waters rose and rose, until what is now Lake Huron, Lake Michigan, and Lake Superior were all one giant water body known as Lake Nipissing (all three of these lakes were then one body of water). You can see the highest old beach line of this lake at various places, such as on the road leading down the driveway to the Pequaming Site.

In Lake Nipissing, the present restrictions between Lake Michigan, Lake Huron and Lake Superior were all below water, and water craft could have easily traversed between all these lakes without portaging. Furthermore, the rising water level of Lake Nipissing gradually punched a new outlet through terrain on the south end of Lake Michigan near what is now the Chicago Ship Canal. This drained the waters of Lake Nipissing into the Mississippi (opening in about 3300 to 3000 BC). This also would have made it possible for large boats and ships to come up the Mississippi and into Lake Nipissing and then right to the natural boat slips near the Ship Site, and Mummy Mountain, etc., without restrictions.

This situation lasted until about 2200 BC when the St. Marys River formed, to isolate the water level of Lake Superior from that of Lake Huron and Lake Michigan. There was also a small stream which led from Lake Huron south to the Niagara River This stream gradually eroded through the glacial till to provide a new (and now the only) outlet from the Great Lakes. As it eroded, it lowered the water levels of lakes until the level water outlet from Lake Michigan to the Mississippi near the Chicago closed forever (by about 1200 BC). Thereafter, the copper mines in Lake Superior could only be reached along various river routes, all requiring some very

serious and significant portaging. The days of old ship travel directly from the Mississippi River to the shores of Lake Superior were over.<sup>8</sup>

But the water level at the Ship Site would have provided an ideal boat slip from about 3000 BC to 2600 BC, the first part of the ancient copper mining era. This was also a time when ships could have come from the Gulf of Mexico up the Mississippi River, through the area now called the Chicago Ship Canal, and directly to the site. This period also overlaps the time when the people we call the Minoans (from Greek legends about King Minos) were the main copper traders in the Mediterranean. This was before their fall in about 1600 BC and before the Phoenicians came from the intermarriage between the older "Sea People" and residents of Canaan (near the Holy Land) in about 1200 BC.

Figures 15, 16, and 17 show the different river routes that could have been used in the past for people to move copper from Lake Superior. Before the Chicago Ship Canal opened, the route would have been to the northeast, through the river system now known as North Bay. This very route was also used in later times by the French beginning in the 1600s, following their native guides. But unlike ancient vessels, the French had to traverse this route by light birch bark canoes over numerous portages. Back in time, this once open route became more and more restricted until it completely closed off to direct river travel by about 2400 BC.

As the land around North Bay rose over the centuries due to isostatic rebound, this river system also rose (before pinching off entirely). Like behind a natural dam on the water running from Lake Superior, the water rose and rose. Waters of Lake Superior, Lake Michigan, and Lake Huron were one giant lake, known as Lake Nipissing. By 3300 BC (maximum Lake Nipissing stage) the water had reached its highest level and punched out an outlet to the Mississippi River at the southern end of Lake Michigan (near the modern Chicago Ship Canal). This became the main means of entering the waters of Lake Superior—an excellent route which required no portaging from the Gulf of Mexico to the shores near the Ship Site. This route lasted until about 2200 BC, when it would have been necessary to portage the rapids of the St. Mary's River, or carry goods between boats at either end. By about 1200 BC (about at the end of the ancient copper mining era) the river through the Chicago Ship Canal also got choked off. Thereafter, all of the water flowed into the Niagara River, which rapidly eroded to form Niagara Falls.

Figures 15, 16, and 17 show the different water routes that could have been used for moving copper from the shores of Lake Superior. By the 1600s, the portages were very burdensome, and the French ignored the copper and concentrated on furs, which were lighter and more valuable per weight.

South of a hinge line through Green Bay, Wisconsin, to the west, the isostatic adjustment, instead of being upward, was downward. This is similar to the adjustment on thin "rubber ice", when you walk on it and then climb carefully to shore. Where you stood, the thin ice depressed. The surrounding area, to compensate, rose slightly beyond what can be called a "hinge line." This rising can be called a "forebulge." When you leave the threatening thin ice, the area where you stood rises, and the forebulge goes back down. (See Figure C-4.) It is important to note that from Green Bay to the north, the land has been rising since the glacier melted. The further north you go, the more dramatic the rise. It is about 20 feet near Pequaming. You can dramatically see the ancient raised beach line, where the water once existed in about 3300 BC. The uplift is much greater further north.

One might sense a problem with the Old Stone Fort on the north shore of Lake Superior being constructed not before 1800 BC. From our analysis of Larsen's data, it seems that Lake Superior separated from Lake Huron and Lake Michgan about 400 years earlier (when the St. Mary's River was formed). We must consider that large boats, coming up from the outlet near Chicago, would either have to negotiate St. Mary's River after about 2200 BC, or that there would have been both large boats on Lake Superior and on the Mississippi, and also smaller craft which could negotiate the rapids in between. This is parallel to the unsuccessful plan of the French to build the lake ship, "The Griffin," to sail the water of Lake Superior and birch bark canoes for the rivers and portages.

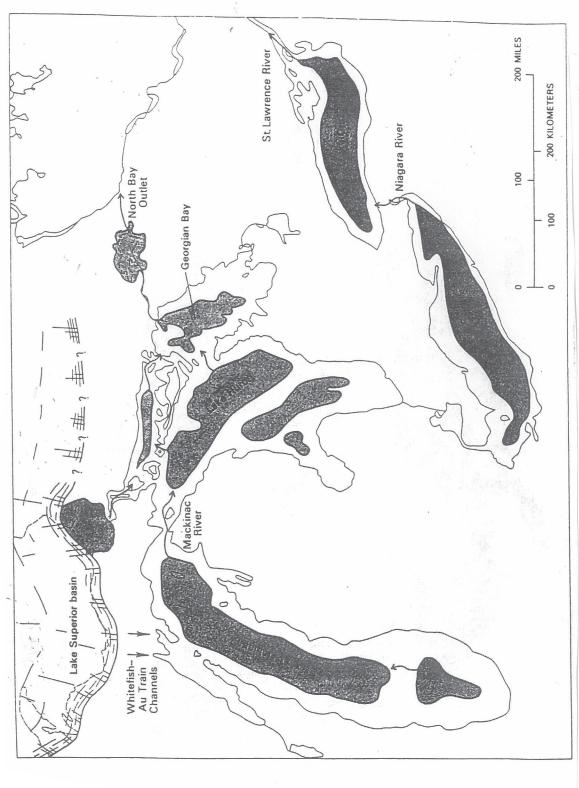


Figure 15. Water outlet from the melting glacier in about 8000 BC (Modified from Larsen, 1987, page 29.)

The prime drainage to the Atlantic was through North Bay, Ontario -- then at a much lower elevation from being depressed by the heavy weight of the glacier.

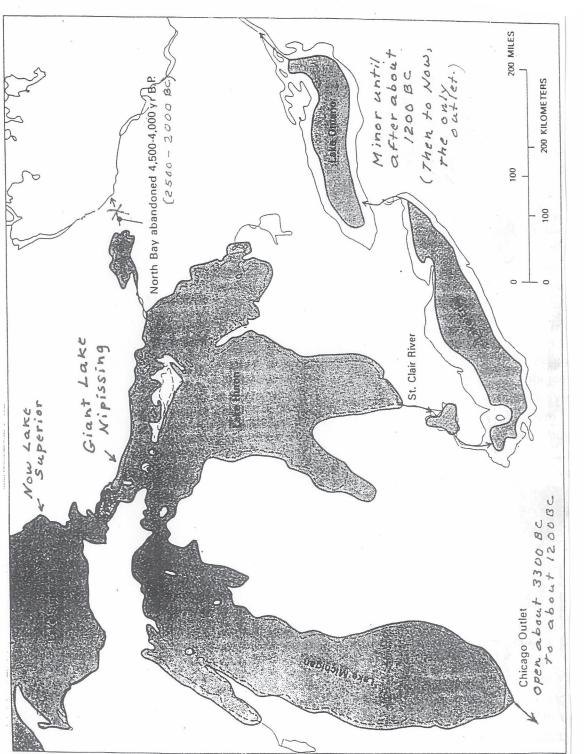


Figure 16. High water period known as Lake Nipissing, which occurred during most of the ancient copper mining era --From about 3300 BC to 1200 BC, the major outlet was at the Chicago outlet which ran into the Mississippi. -- (Modified from Larsen, 1987, page 31.)

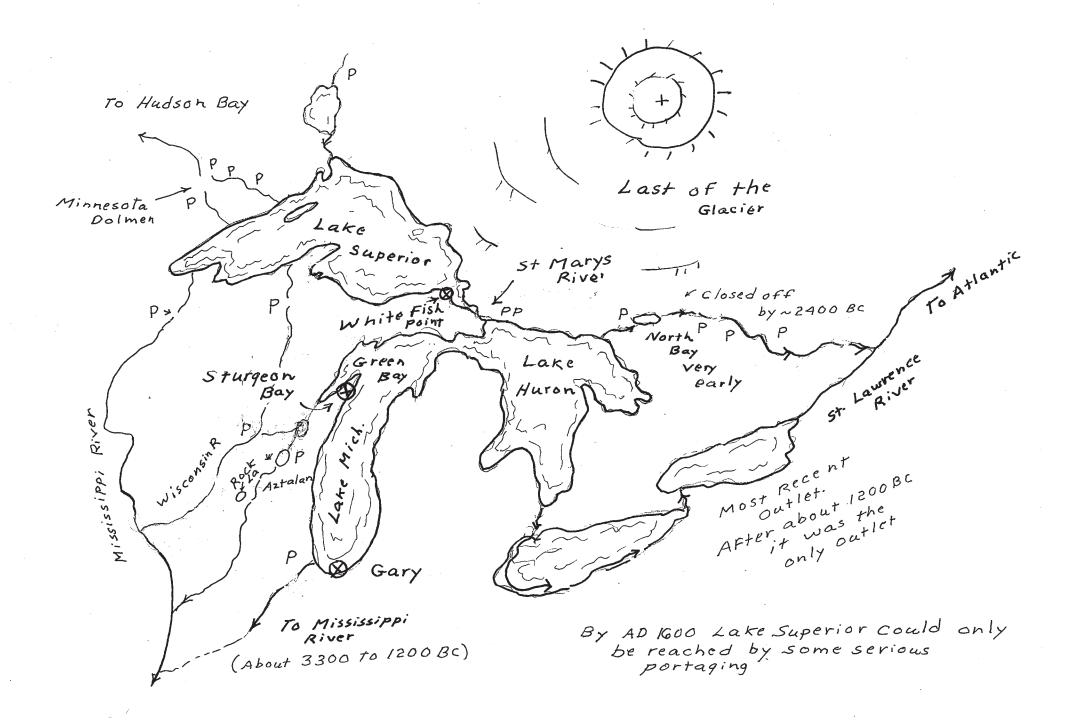


Figure 17. Water routes to Lake Superior as the French Fur Traders found them

#### **Conclusions:**

In order to understand the ancient water routes that people could have used from about 3000 BC to 1000 BC, when the ancient copper mines of Lake Superior were most actively worked, we must consider the ancient water levels during that time. They were not the same as today. The land is not stable, but is adjusting from the tremendous weight of the several-mile-high glacier, which once stood on the land, like a giant mountain range. This idea of isostatic rebound or isostatic adjustment of the Great Lakes, was proposed by Prof. Chamberlain (Geology Dept.) at the University of Wisconsin, in the late 1800s. His studies came from examining the elevated ancient beach lines, which you can also see around Lake Superior. Chamberlain's work has been continued over the generations. Recent publications by Larsen (Appendix C) indicate that from the best data available today, the area on the north shore of Lake Superior is rising at present rate of about 2 ft. / century.

On the southwest end of Lake Superior, the land is rising by about 0.5 ft. / century (and near Copper Harbor, about 1.2 ft. / century). As we move south of Green Bay, south of the ancient glacier, into what was called the "fore-bulge" area, the land is gradually sinking relative to mean ground water, and the water levels are rising, relative to the land. It is in this region where we encounter the mysteries of Rock Lake (near Lake Mills, Wisconsin). With my colleague Lloyde Hornbostle, and other helpers, we mapped large earthen mounds, a submerged effigy mound group, and round rock barrels (similar to Pukwaska Pits on the north shore of Lake Superior) in an area which would been above water when the first water-operated saw mill was built in the state (thus the name of Lake Mills). Over half of the present area of the lake would have been above water, above the shore of a lake, before the river was dammed in the 1840s.

But deeper still are strange rock features, including the famous "Pyramid" in Rock Lake, which would have been above water and on the edge of an ancient stream in about 2000 BC and before. <sup>9</sup> If we are aware that the present terrain relative to the lake levels is not the same as in the past, then these now submerged features should be part of our studies, just like the effigy mounds and rock barrels which still exist above water in other areas. But the rock features on the bottom of Rock Lake were dismissed by authorities from the state archaeologist's office, as obviously made by the glacier, because Indians did not build things under water. In the Scientific Age, this simplistic system of dismissing out-of-place data needs to change. We need to be aware of the fact that present water levels are not the same as in the past.

The data on changing water levels as given by Larsen from the United States Geological Survey, in Annex C, should be available to all people who study the features related to the ancient copper mines, and the probable harbors used at that time. This data indicates that the area where the Ship Site is located, Mummy Mountain, and the Ancient Fort on the north shore of Lake Superior would have served as excellent harbors in the first part of the period when the ancient copper mines are believed to have been heavily worked.

Long- range alignments between some sites suggest that the ancient sailors were well aware of other ancient harbors around the lake, not visible to them. For example, the most prominent alignment from the Pequaming Site on the south side of Lake Superior is towards where the sun will rise on the summer solstice. Follow this alignment across the lake (to the north shore of Lake Superior, which you can not see) and you come to the ancient Stone Fort. The Stone Fort would have served as an ideal harbor before about 1800 BC. But because Pequming is only about 9 to 12 ft. above present level of Lake Superior, it could only have been an active ceremonial site after about AD 900 to AD 1200. The area near the present shore line at Pequaming, where an ancient rock barrel has been reconstructed, would only have been above water after about AD 1200. It is similar in shape to rock barrels which exist near the ancient Norse site at Lanse Aux Meadows, Newfoundland, which has been finally proven to be a Norse settlement used in about AD 1200.

Consequently, the features at the Pequaming Site could only have been constructed after about AD 900 to AD 1200 (the time of the traditional Irish and Norse incursions to this land). Yet the Pequaming Site has a main alignment to the ancient Stone Fort, which could only have been an active protected harbor in about 1800 BC. The idea of long- range alignments between sites is found elsewhere, such as between the Mexican center of Teotihuacan and Thunder Bay (which ancient people would have used as they went to Isle Royal for copper). See Scherz, April, 2011, Annex A.

After helping Ralph Redfox (Cheyenne Elder and keeper of the ancient Star Knowledge of his people) with his long range alignments from the Bighorn Medicine Wheel, we have concluded that you do not need GPS, nor sextants, nor spherical trig tables to do this type of long-range work. It can all be done by use of plumb bobs, poles and ropes (and a knowledgeable mind). If Ralph's ancestors could have laid out alignments from the Bighorn Medicine Wheel in Montana to sites east of the Mississippi River, then the same techniques could also have been used across the open seas, as in the days of the Phoenicians, and before them, the Minoans.

#### **Selected References:**

(See the end of Annex C.)

#### **Appendices:**

- Appendix A. From my Field Notebook on First Visit to the Ship Site
- Appendix B. Paper by Prof. Jack and Sandra Steinbring on the Ship Petroglyph
- Appendix C. Changing Water Levels from the Melting Glacier
- Appendix D. You can set the Solar Calendar from the Ship Site.

See Scherz, James P., Oct., 1999 and 6 Aug., 2000 on hydrographic surveys of Rock Lake (in reference section at the end of Appendix C).

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# Appendix A

# Working Paper 20 May, 2008

By James P. Scherz 20 May, 2008

#### **Overview:**

The purpose of this paper is to summarize from field notes my observations relating to what could be an exceedingly important petroglyph site near prehistoric copper mines of Lake Superior and to make recommendations for verification of approximate date of the inscriptions and for their preservation. The tour to the site was part of a several-day Ancient Waterways workshop for researchers, authors, film makers, and Native Americans. The workshop was organized by Susan English. The site was visited by seven of the attendees on the morning of 18 May, 2008, after most attendees had gone home. The person who led us to the site was not sure that it was important or if we would be interested. But, indeed, we were. The site was revisited by four individuals on 19 May, when the sun was more favorable for photography. Reportedly, the site has been previously known about by a few local people. To their credit, they did not scratch out the lichen from the inscriptions nor outline them with chalk for better photography, as has been done at numerous other sites before serious scientific study could be done. And they took efforts to make the site known to people who might adequately study and work to protect the area. The site consists of three sets of petroglyphs carved into an exposed area of bedrock near the shores of Lake Superior. The most impressive petroglyph is of a ship.

#### The Image of the Ship:

Figure 1 shows a copy of a page of my field note book when I sketched what I saw of the ship image on 19 May, under ideal lighting conditions. At that time, the sun was low in the sky, highlighting the grooves, which are about  $\frac{1}{8}$  of an inch wide and  $\frac{1}{8}$  of an inch deep. They are weathered on the bottom and well covered with lichen. The style of the image is unusual, like a labyrinth with once continuous line. The ship has a square sail, like a Viking or Phoenician ship. But the body is fatter than one would expect from a swift Norse ship. And instead of having a horse head on the front, it has the shape of a bird. The single continuous line which creates the image begins at the mouth of the bird and ends at its eye.

Associated with this image is some script that seems to have been made with a different tool and is possibly of a different age. At first viewing, it does not seem to be French, Latin, or historical graffiti in English. But more study is needed after better photos are taken to determine what these symbols might relate to. The grooves in the script are about  $\frac{1}{16}$  of an inch deep and about  $\frac{1}{16}$  of an inch wide. See Figure 2.

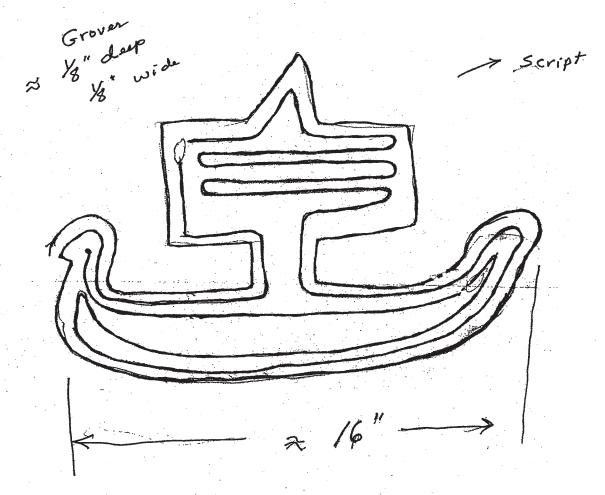


Figure 1. Ship Petroglyph

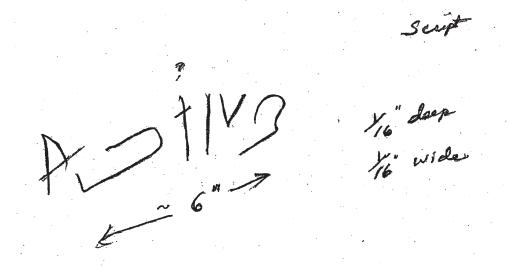


Figure 2. Apparent script associated with Ship Petroglyph (Xerox copy of my original field sketch)

## Other widely separated petroglyphs at this site:

The image of the ship is on the northwestern side of a raised rock outcrop on the side facing towards the lake. Also on this outcrop are two other areas of petroglyphs: a stylized bear image, and a modified image of a thunderbird. The bear image is on the southward side of the outcrop. The thunderbird image is far away from the ship on the eastward side of the outcrop.

These images suggest that the site was known about, honored, and possibly maintained by Native Americans associated with the Bear Clan and possibly the Thunder or Thunderbird Clan. The Bears and the Thunderbirds are important clans of the HoChunk (Winnebago) yet today. The Bear Clan are the movers and enforcers within the tribe. The Thunder or Thunderbird Clan once provided the traditional chiefs of the tribe.

There was a HoChunk story that at one time a mariner people once came to mine copper and that the HoChunk were friendly to them and let them travel through their land and were even considered allies for a time. The presence of the bear glyph and thunderbird glyph at this site is of special interest in light of this story.

#### The Unusual Petroglyph of a Bear:

There is ample evidence in my mind that the site was once maintained by members of the Bear Clan or the Sauk (Bear Tribe). It may still be. As you approach the raised area of bedrock, there are two possible easy areas of access or natural entrances. Although most of the rocks are very old and gray, the best area of access is clearly marked by rocks turned over to expose their lighter areas, free of lichen. Many are in the shape of arrows pointing uphill. As one begins the approach along this route, the bear glyph is there, like the name of an art museum at its entrance. Figure 3 shows the bear glyph. One cannot miss it when approaching by this route. Unlike the other glyphs, the area around the bear image has been relatively cleared of lichen, clearly highlighting the petroglyph in the center. Like the image of the ship, the bear image has aspects of a labyrinth pattern. Although the outline of the bear is a closed line, the details are filled in by a single line running from its nose to its heart. (The body of the ship is in the shape of a large bird and is formed by a single line running from its nose to its eye.)

The labyrinth-like line within the bear glyph suggests at least two layers of meaning in this petroglyph. The first obvious meaning is the bear shape. The second is the labyrinth within it. And Lee Pennington (documentary film maker) saw yet another layer of meaning. He and his wife Joy, while reviewing their digital images on a TV set, pointed out that the bear image can also be viewed as the upper part of a face watching you. See Figure 3A.

Although the bear glyph may be as old as the ship, the lichen around the bear glyph has been partly removed making it dramatic and easy to see. See Figure 3A. Without some guidance, the image of the ship is very hard to find, even if you know it is there.

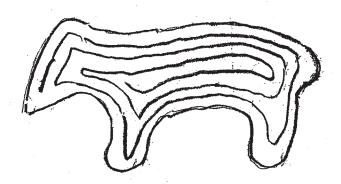


Figure 3. The Bear Petroglyph (Xerox copy from my field note book)

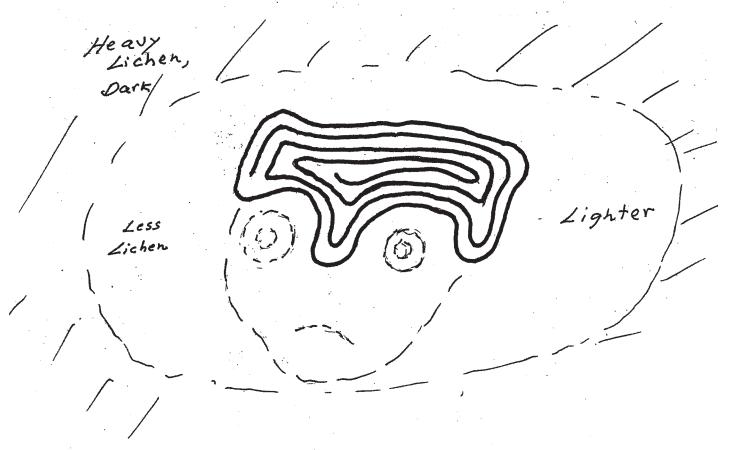


Figure 3A. The Face as perceived by the Penningtons

<sup>&</sup>lt;sup>1</sup> The Sauk tribe, once in the area but now in Oklahoma, should also not discounted. The name Sauk is said to mean bear.

#### Thunderbird Glyph and Pointers to it:

As one reaches the top of the raised outcrop area, there is an area of light rocks (tipped upside down) apparently forming a circle for a fire. It may be from more recent Native Americans or modern campers. Across the outcrop to the northwest is another large light rock, easily seen, where the ship image is located. See Figure 4. After pondering the image of the ship, one's eye may be drawn to a series of lichen-covered arrow rocks which lead you southwest from the ship to a cairn of rocks. From this cairn, other arrow rocks point eastward across the length of the outcrop area to where the thunderbird petroglyph can be found. Near the thunderbird glyph are other arrow rocks pointing back to where you came as if one is to enter and leave the area like entering and leaving a labyrinth. If one finds the bear image, the rocks will lead you to the image of the ship. Likewise if one were to first find the thunderbird image, backtracking the obvious pointer rocks will also lead you to the ship.

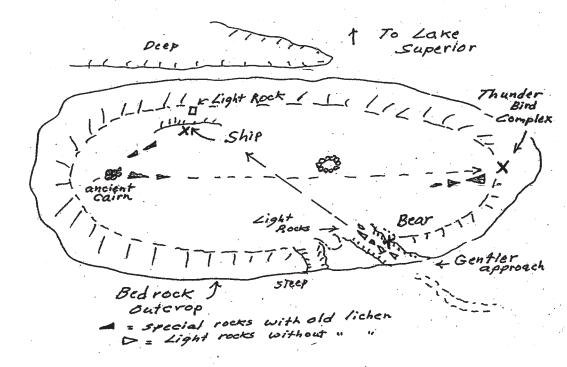


Figure 4. Pointed Rocks Leading a Visitor in Labyrinth- fashion across the Outcrop

Although I have seen numerous thunderbird glyphs, this image of the thunderbird is unlike any other I have seen. Instead of having a head like an eagle, I first saw it as being a pileated woodpecker, with a topnotch. See Figure 5. But upon viewing the photos that night, Lee Pennington from Kentucky, who had not seen so many thunderbird images, said that what I saw as the head of a pileated woodpecker, he saw as a singing songbird. When he pointed it out, I clearly saw what he meant. And I saw another layer of meaning and possibly a very important one for telling the story that these glyphs were apparently meant to tell. The historical story that struck my mind from these glyphs (which apparently were meant to be read in a labyrinth fashion) was that the Bears were associated with the ship while the ruling Thunderbirds, instead of being fierce, were like friendly songbirds.

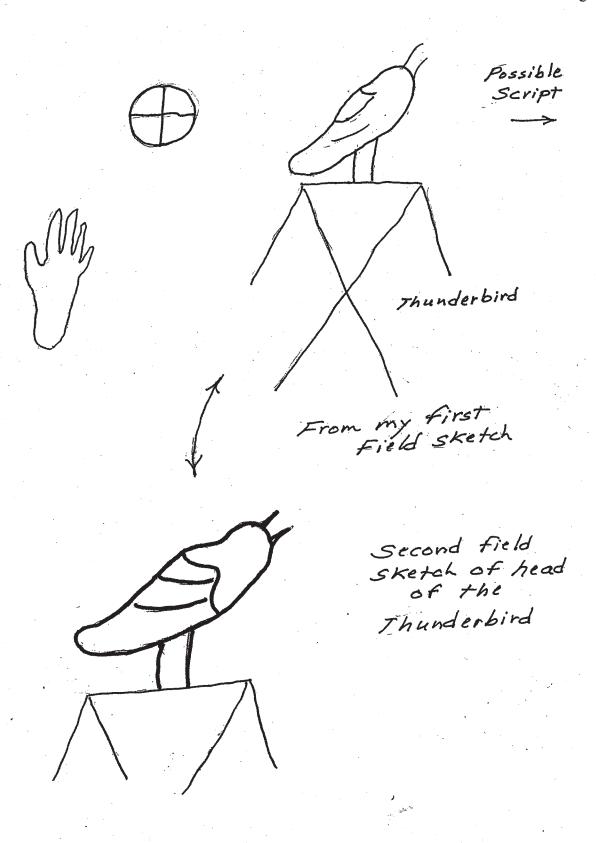


Figure 5. The Thunderbird Petroglyph Complex

The best plan would be to create a replica of these petroglyphs (and others on a distant prominent peak within eye sight of this site) so that they can be viewed elsewhere. The organized rocks at this outcrop are in my view a vital part of the layout of the site, and no rocks should be moved. Special rocks are found at various ancient ceremonial sites and seem to help tell the story of how the site was to be used. Pamita (a Native American lodge member from central Wisconsin) called such rocks "Toths." He said they are clues of how to read the site for the initiated, but are meant to be overlooked by the common person. At present, such rocks at this site seem to all be present, and should remain so.

In my view, this site has been important to certain Native Americans, and may still be. High members of the HoChunk and Ojibway Bear and Thunder Clans should be contacted, along with any interested Sauk before serious work is done at the site.

The unique style of art for the ship and the bear glyphs provides an opportunity to search for similar art styles in both the Old World and the New. The continuous lines comprising these figures have their parallel with continuous lines on the so-called Adena Tablets which Vince Barrows so aptly elaborated on at the Ancient Waterways workshop. See Figure 6. The period of the Adena along the waterways further south and east would correspond to the period when there was considerable mining in the summer in the ancient pits along Lake Superior.

And the Adena built giant earthen mounds similar in size and shape to those I have seen along the shores of Lake Superior around Huron Mountain. On the grounds of the Huron Mountain Club, we surveyed a group of four such mounds. Their relative positions function as a summer sunrise calendar highlighting the summer solstice. And these mounds were checked with the HoChunk ground penetrating radar. The operator confirmed them to be burial mounds and indicated considerable amounts of metal within each mound. These mounds have been previously reported in my paper "Old WATER LEVELS AND WATERWAYS During the Ancient Copper Mining Era (about 3000 BC to 1000 BC)", July, 1999. This report was distributed locally and Fred Rydholm said he brought the mounds to the attention of a professional archaeologist, who was not interested in investigating.

The mounds in the Huron Mountain Club are located on what would have been an island in a well protected bay when the water level was higher. Rock outcrops near the site within the Huron Mountain Club land should also be carefully checked for possible petroglyphs.

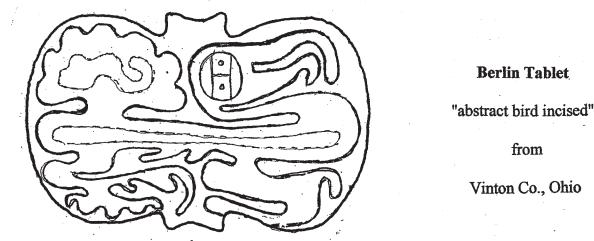


Figure 6. Example of continuous line art on an Adena tablet

# Appendix B

## Rock Art near Copper Harbor, Michigan

## Jack and Sandra Steinbring

In response to information conveyed by MAGF member David Weier, a field trip to the Copper Harbor area in far Northern Michigan was undertaken in October of 2012. Our contact person, Bob Wheeler in Houghton, Michigan, guided us to several engraving sites as well as a visit to one of the prehistoric copper pit mines. We also visited one museum and a small engraving site with a boulder cairn component at the Wheeler residence in Houghton. The Copper Harbor Petroglyph Site has been given official Michigan State Site designation 20KE71.

# The Petroglyphs

The engraving which has caused the highest level of attention is the image of a ship (Fig. 1). Most of the observers identify it as Mediterranean. For the most part, this identification has been rejected, especially by archaeologists who consider it implausible. One alternative explanation is that it is fraudulent, presumably created by partying college students. The initial discovery is vague, but the principal figures in it seem to be members of organizations focused on Old World Cultures with connections to the Americas during the European Bronze Age. One of these theoretical connections features trade for Lake Superior copper, suggesting that it was used to produce bronze, an alloy of copper and tin. One of these theories suggests that the ancient Mediterraneans traveled up the Mississippi River, landing eventually near Copper Harbor, Michigan. It is not, however, the design of this article to debate the accuracy of these claims and their numerous variations.

# Observations of the Ship

The vessel is obviously a wind propelled sailing ship with a central mast.

Significantly, in its classification, it has no oars. This means it is <u>not</u> a trireme, perhaps

the most common of Bronze Age vessel types; having three sets of oars on each side located one above the other. Most warships during the Bronze Age had oarsmen, and a sharply pointed bow used for ramming other ships in combat.

Another obvious attribute is the high arched bow and stern, with the bow the highest and with a hint of representative sculpture, perhaps a bird or other animals. In the issue of artistic conveyance the central mast is clearly situated in front of the starboard hull, an indication of third dimensionality. This form of representation is unusual in the maritime art of the Bronze Age. Also unusual is a sharp point extending upwards from the otherwise square sail. There is little precedence for this in the literature of Bronze Age sail craft. One such representation is known from the Minoan Culture of Crete. Many, however, can be construed to have a somewhat pointed configuration atop the sail. In the case of the Copper Harbor ship, the point is part of the sail.

Another remarkable feature of the image is its maze-like treatment of the body of the vessel and the sail. These are produced by a single continuous line. In producing the horizontal lines of the hull the lines are closed with no end and no beginning. The same is true of the sail. The maze is known from many cultures world-wide, but one of the most famous is from Minoan Mythology (Robins 1989:142).

All of the lines are clear, well made, and symmetrical. The overall impression is that this is <u>stylization</u>, not a naturalistic, representational image. As a stylization it is conveying, perhaps, a model or abstraction of a class of vessel imagery. And, again, one must emphasize the clarity of this image. This is produced by the depth of the engraving, and the manipulation of grazing light. The formation upon which it is engraved is basalt, a hard igneous rock.

Maximum clarity occurs at only one day of the year! The petroglyph is situated on the slanted-north face of an east/west rock ridge at a point when only the highest

position of the sun can illuminate the full aspect of the image. This occurs only at noon on the summer solstice. There is, of course, near full clarity for perhaps a month on both sides of this point in time, but the ultimate condition is at summer solstice. We learned this early in our observations because it was not fully illuminated in October of 2012 and good pictures were not possible, even with a bright clear day. The north aspect of the image was approximately one-half in shadow.

The ship image is somewhat larger than Native engravings in the Midwest or Subarctic. It is 35.2 cm long by 20.0 cm high. The grooves making up the image are 2.3 mm wide and 2.0 mm deep. The technology appears to be grooving, virtually universal in the sedimentary formations of the Midwest. In neighboring Wisconsin, all but two petroglyph sites (of about 130) are grooved in sandstone. The Copper Harbor ship required a high level of expertise, substantial time, and a significant knowledge of early Old World ships (or at least of this particular type.) The mnemonic capabilities of Algonkian speakers are legendary, so that the prospect of an aboriginal origin for this engraving may not be dismissed. It would still require the theoretical presence of a Mediterranean vessel at an earlier time.

The site of the image is at a location which overlooks Lake Superior. The view is now obstructed by vegetation, but was clear in ancient times.

#### The Bear

Across the formation to the southeast there is a stylistically similar image of a bear (Fig. 2). In outline this image is much like the common aboriginal bear images (Hoffman 1891:193, 196, 220 Fig. 20, Dewdney 1975:17), particularly among Algonkian speakers. Again the body of this image contains the maze-like continuous line. In this case, the line does not close. It leads from the heart region and ends at the nose. Concentric lines are present among the ritual pictography of the Ojibwa (Dewdney 1975: 150). The image is about one-third the size of the ship, with the engraved lines of equal width and depth. The bear figures prominently in the ritual arts and mythology of many subarctic cultures, especially Algonkian groups like the Ojibwa who honor the

bear as the guardian spirit of the Fourth Degree of the Midewiwin, or "Grand Medicine Society" (Hoffman 1891). Another feature found in Ojibwa pictography is the "heart line," a line connecting the heart with the head.

This image has suffered some vandalism in that the ventral areas which make up the legs have had a small dot added to make the whole image to appear as a face. The dots have not developed a patina whereas the rest of the image is substantially repatinated. At the time of our visit this image had been "cleaned." The lichen, which clearly had encroached upon the image, had been removed.

The ship and the bear images are quite separated from each other but are clearly iconographically related. The body treatment is unique so that it is virtually certain that they have a common origin.

## Additional Petroglyphs

There are a number of other figures in the area. While less remarkable, some of them do offer commonalities with aboriginal pictography. One of these is the triangular body form of anthropomorphs. One of these features has two stick-like projections from the shoulder area. To these has been added a bird-like image in profile. Other investigators have referred to this as a "thunderbird," and have interpreted a second set of parallel stick marks protruding from the head as an open beak. Birds in profile are well known in the pictography of the Ojibwa Midewiwin (Dewdney 1975:82-83), but not as connected to anthropomorphs.

Other markings on this site include an equilateral cross within a circle. This form is known from prehistoric populations in the Midwest, principally Mississippian (A.D. 800-1450). A handprint produced by pecking is present, again a common element in North American Indian pictography. Some simple irregular lines are present which might be viewed as "script" by some. Beyond this, there is known to be present in the region a flat panel containing numerous cupules viewed by Dr. James Scherz as a star

References Cited

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map (Scherz 2005). There are also a few features best described as petroforms including a boulder circle and a cairn. A cairn is located at the Wheeler residence in Houghton along with several aboriginal markings. Test excavations at the Wheeler site may be undertaken in September 2013.

#### Conclusions

It would be unwise to speculate too much from such a brief and superficial examination of the Copper Harbor rock art. Parallels with other North American marking sites have been noted. The ship image is patently not North American, and is best classed as a Mediterranean sailing vessel. There is no intrinsic evidence that it is fraudulent. Substantial patination is present, along with multiple lichen colonizations. Without advanced technical analysis (some microscopic) this image cannot be rejected as the result of frivolous activity. It is very well made and required highly specialized knowledge of ancient Old World maritime imagery (Figs. 4-10).

The bear image has considerable precedence in North American pictography, including the continuous, maze-like line within the body. It too has evidence of repatination and lichenation, most of it removed at one or more times, presumably to photograph it or to otherwise replicate the image. Both the ship and bear have been expertly replicated in fibre-glass by non-intrusive means (Figs 3, A & B). The technique was first used in North America in the replication of one petroglyph at The Hensler Site in East Central Wisconsin (Steinbring and Farvour, 1987:396).

Most of the other images have precedence in various aboriginal contexts, but some are the result of recent graffiti.

Overall, this is a legitimate rock art site area with an aboriginal involvement. It should be protected from further vandalism, starting with the removal of any indications of its location from the nearest roadway.

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Torr, Cecil

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Ancient Ships, Argonauts, Inc. Chicago

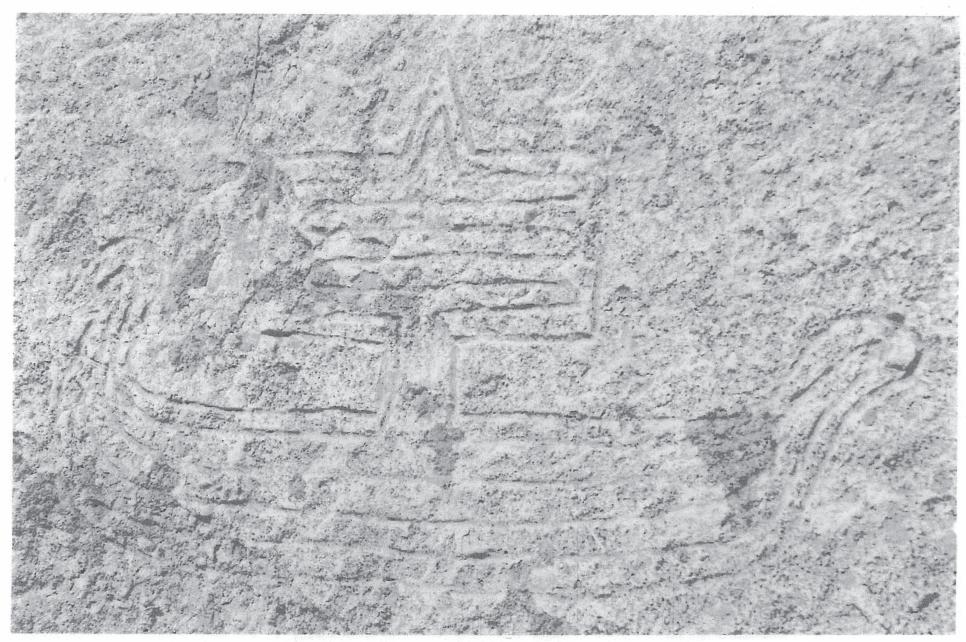
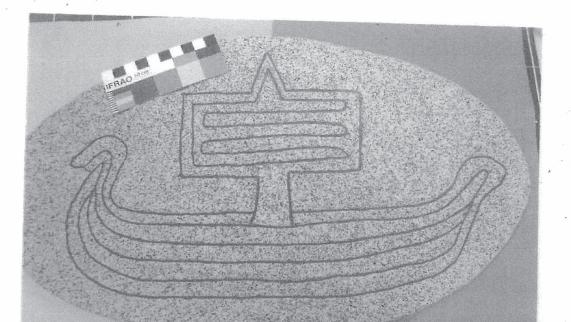


Fig. 1 The Copper Harbor Ship petroglyph.

(photo by Robert Wheeler)



Fig. 2 The bear petroglyph at the Copper Harbor Petroglyph Site, (20KE71).



3a

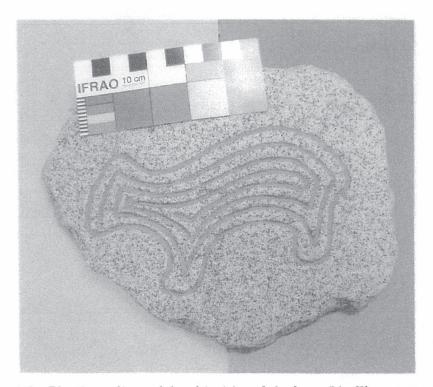


Fig. 3 a & b Plastic replicas of the ship (a) and the bear (b). These superb reproductions were made by Robert Wheeler and Dan Merrill.

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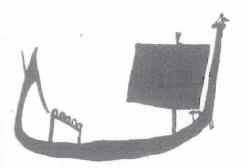


Fig. 4 Oldest known image of a sailing vessel, or an Egyptian vase 3200 B.C. (Casson 1991:Figure 1)

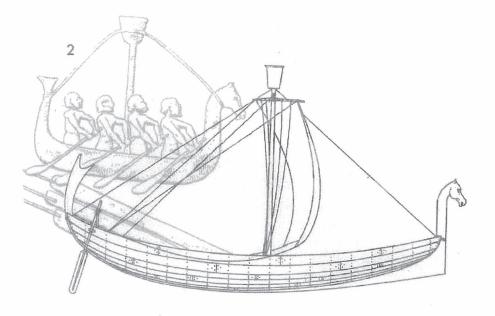


Fig. 5 An Assyrian sailing vessel, 700 B.C. (Landström 1961:31)



Fig. 6 A Greek merchantman 4500 B.C. (Greenhill, Basil 1988:26)



Fig. 7 A Roman merchantman A.D. 1 (Greenhill 1988:26)

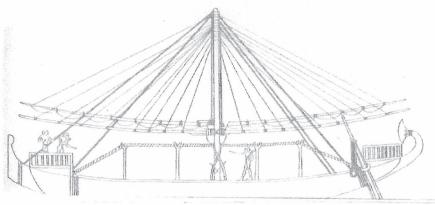


Fig. 8 An Egyptian (Nile) Ship on the Red Sea, ca 1250 B.C.

(Torr 1964: Plate 1, No. 4)

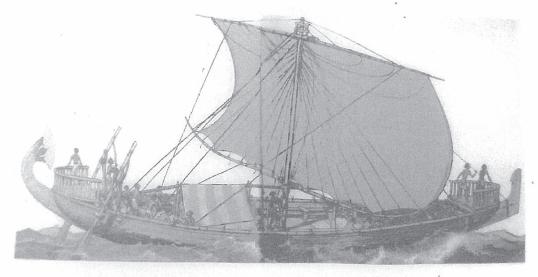


Fig. 9 A reconstruction of Queen Hatshepsut's ship sent to "Punt" (exact whereabouts unknown) ca 1500 B.C. (Landström 1961:20)

#### Annex C

## Changing Water Levels after the Melting Glacier

and Refining the Rate of Isostatic Rebound

The elevation of an ancient beach line (such as the countor line of 662 or 664 ft. MSL in Figure C-1) can be approximately calculated by taking the present rate of uplift (in ft. per century) times the number of centuries. From the curves given by Larsen from the USGS in 1994, in Figure C-2, we got the <u>present rate</u> of uplift (in 1994) of about 1.2 ft. / century in the area near the Ship Petroglyph. From 7.5 min. USGS Topo Maps (about 1950) and from Larsen's data, we got the present level of Lake Superior (at that time) as 602 ft., MSL. We know from lake gravel just north of the outcrop where the Ship Petroglyph is located that there was once an old lake at this spot long ago. The appropriate elevations when this area would have been an ideal boat slip would have been when the water level was at about 662 ft., and 664 ft., MSL. This is 60 ft. and 62 ft. above the present level of Lake Superior, respectively.

Assuming linear math, we can calculate the <u>distance</u> (in this case, uplift of 60 and 62 ft.) as being equal to the <u>present rate</u> (of uplift) times the time in centuries. Assuming that the "present" rate of 1.2 ft./century was also the mean rate over the time period involved, we get:

$$T = D/R$$
, or:

 $T_1 = 60$  ft./ 1.2 ft. per century = 50 centuries (or 5000 years or about 3000 BC) and

 $T_2 = 62$  ft./ 1.2 ft. per century = 52 centuries (or 5200 years or about 3200 BC).

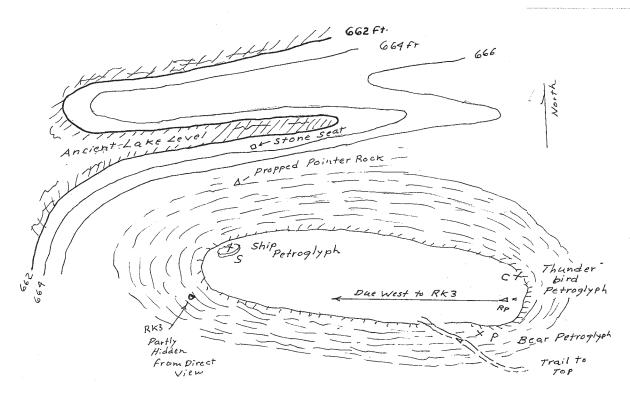
These calculations are very easy to do, and will give us a ball park value. But for refined values (which we need in this case) we must realize that the rate of uplift has also been changing slowly with time, and that if we include these concepts, we will have slightly different values. As will be shown with such refined calculations, we will get values more like:

 $T_1 = 60$  ft./ 1.3 ft. per century = 46 centuries (or 4600 years or about 2600 BC) and

 $T_2 = 62$  ft./ 1.3 ft. per century = 47.7 centuries (or 4770 years or about 2800 BC).

The reason for the differences in values is because when we use the present rate of uplift and apply it to the entire period of time of uplift, we are using normal linear math. See Figure C-3. The real uplift follows more an exponential rate. For such work, we need to go to the math of exponents, which we also call logs. The mathematics of logs have been around for a long time. Scientists have been using logarithms with base 10 and e (2.718) for hundreds of years. Nature has been using logarithms based on the ancient Golden Ratio (1.618) for even longer. Conch shells (prehistoric and present) are constructed by the mathematics of the Golden Ratio, where you can multiply by adding and divide by subtracting without looking up numbers in log tables.





From a large Scale Compliation map, the approximate alignment was measured with a protractor from the Bear Glyph (P) to the Ship Glyph as 23° ± 0.2° from true west. (North of true west). From the Thunderbind Glyph (C) to the Ship Glyph, the angle was 9° ± 0.3° North of True west. The large Arrow Rock Rp, propped up with smaller rocks, like a small dolmen, is obviously important. But it is clearly not pointing towards the ship Petroglyph, but apparently due west. On such a line, over the crest of the hill I we find the prominent rock RK3 It is also an arrow rock, but is pointing eastward. The alignment between Rp and RK3 can be used for setting the day of the autumnal equinox. But the long-range alignment to Brock way Mountain is more accurate and more convenient. See Appendix D.

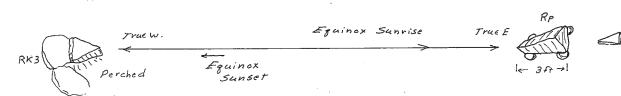


Figure C-1. Contour Lines of greatest interest at the Ship Site

Present level of Lake Superior is 602 ft. Present rate of uplift (from Figure C-2) is 1.2 ft./ century.

As will be calculated, the mean rate of uplift is 1.3 ft./ century.

Focus on contour line of 662 ft.: Total uplift = 602 - 662 ft. = 60 ft.

Total uplift = rate x time, or  $D = R \times T$ . T = D / R = 60 ft. / 1.3 ft. per cent. = 46 centuries or 4600 years ago (about **2600 BC**).

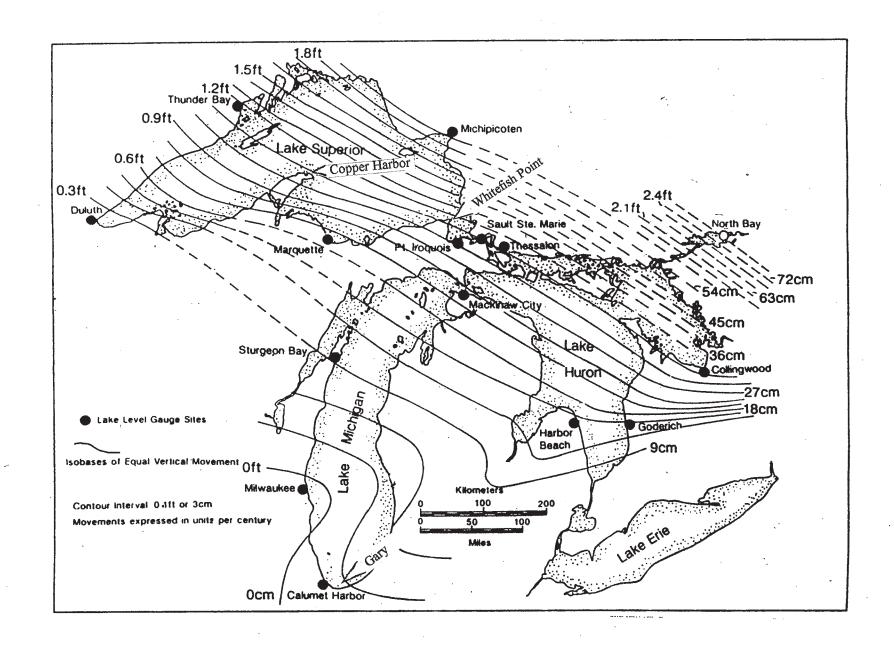


Figure C-2. Larsen's chart in 1994 for <u>present rate</u> of isostatic adjustment for the Great Lakes
--(Modified from Larsen 1994, p 115)--

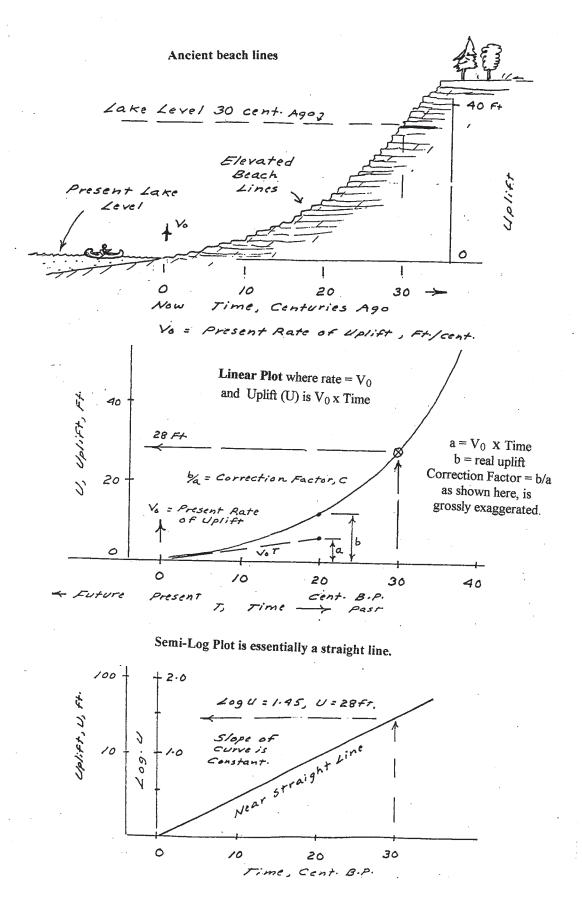


Figure C-3. Plot of uplift of old beaches versus time into the past (from Figure 3, Scherz, January, 2000)

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## Logarithms and Isostatic Rebound

People for more than a century have studied isostatic rebound and have tried to find mathematical models which best fit the levels of ancient beach lines and known dates. This has gone on not only around the Great Lakes, but also in Scandinavia, Greenland, Antarctica, etc. Rather than using linear math, they have found that the math of logarithms best fits the data. A logarithm, on base 10, or e, etc., is an exponential manipulation of numbers, which seems to be the way which many observable events in nature conform. (For example:  $2 = \text{Log}_{10}$  of 100, or  $100 = 10^2$ ;  $1 = \text{Log}_{10}$  of 10, or  $10^1 = 10$ , and  $\text{Log}_{10}$  of 1 = 0, since  $10^0 = 1$ , etc.) Isostatic rebound is no exception. The best fit to the data also has a logarithmic component.

The greatest rate of uplift is naturally directly below the center of the once ancient glacier, where its weight was greatest. The rate of the uplift decreases with time, and has sort of a very long half life, like the rate of radioactive decay.

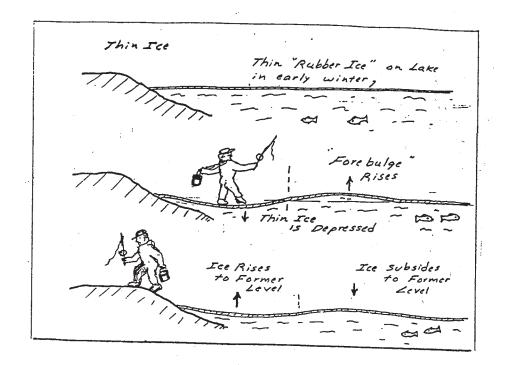
Also, the rates of uplift at points some distance from the center of the glacier near the edge of the uplift (towards the forebulge area) are smaller than near the center of the ancient glacier. (See Figure C-5.)

Of course, nature is not automatically bound by the strict rules of math which scientists like to use in such analysis. But the observable data seems to be best explained by a combination of rules of logarithms and linear math, as we will see.

One of the special situations which must be dealt with in Wisconsin is what can be called the forebulge region, which around the Great Lakes occurred south of the glacier, where the extreme weight caused the land to slightly rise. When the ice melted, this forebulge area seems to be now actually subsiding relative to ground water level. And in Wisconsin, near the so-called hinge area (between uplift and subsidence) recent precise GPS data acquired by the Wisconsin Department of Transportation suggests a slippage along a slippery layer of shale, which runs from Green Bay to the southwest. My analysis of this GPS data suggests that this slippage formed a trench, where there is a much more rapid local subsidence of the earth. The mysterious Lake Mills, with its underwater pyramid seems to be in the middle of the trench of subsidence. But such mysteries are not the focus of this paper. Yet, the working paper which I wrote in January, 2000 for such analysis, will be used for some of the following illustrations. They are important to understanding what has happened near the Ship Site.

	Glacier
Sketch of	Depression Hinge
trench of	Line 1 Forebulge
local extreme	XI III
subsidence	supper shale
near the hinge	Earth's
line between	Adjustment
uplift and	Observed Trench of depression
subsidence	1
	Slippery shale
	TITT associated with Springs

Figure C-4 illustrates the idea of the crust of the earth adjusting after the melting of the massive glacier in northern Wisconsin and Michigan (and into Canada). The concept of isostatic adjustment can be better understood by likening the crust of the earth to a fisherman walking out on new thin ice (called rubber ice) before it is really safe to do ice fishing. This sketch illustrates how the rate of rebound (upward isostatic adjustment) is greatest under the greatest weight. It also illustrates the idea of the forebulge beyond the area of rebound.



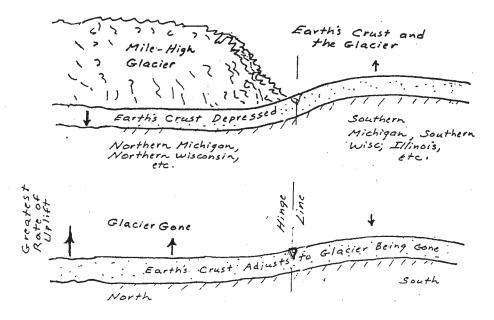
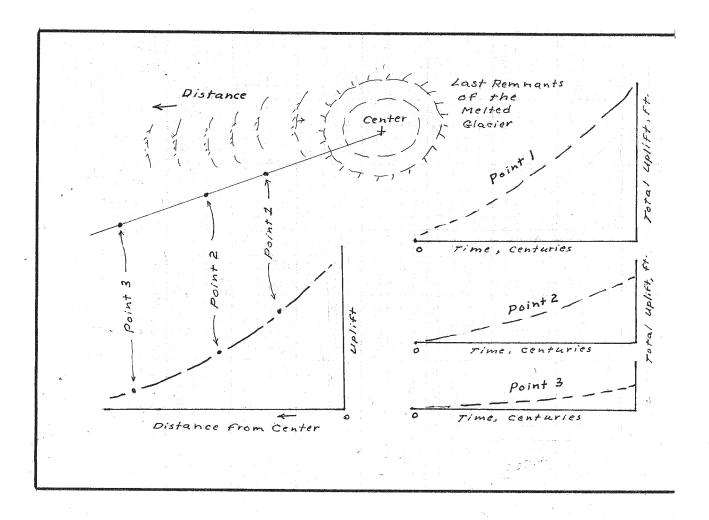


Figure C-4. General principle of isostatic adjustment in laymen's terms



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Figure C-5. Uplift at various distances from the center of the ancient glacier

The following critical observable data for studies of isostatic rebound around Lake Superior (relative to the ancient water level of Lake Nipissing, when Lake Superior and Lake Michigan were one water body) comes from Larsen's reports. These field observations were collected at three key sites where there are good arrays of ancient beaches with reliable radio-carbon dates. These three sites are Whitefish Point, Michigan, Sheboygan, Wisconsin, and at Gary, Indiana. Whitefish Point is nearest the center of the ancient glacier. Sheboygan is more outward from the center, and Gary is beyond the edge of the ancient glacier and main uplift area, and actually in the old forebulge area where the land seems now to be gradually subsiding relative to the level of Lake Michigan. (See Figure C-6).

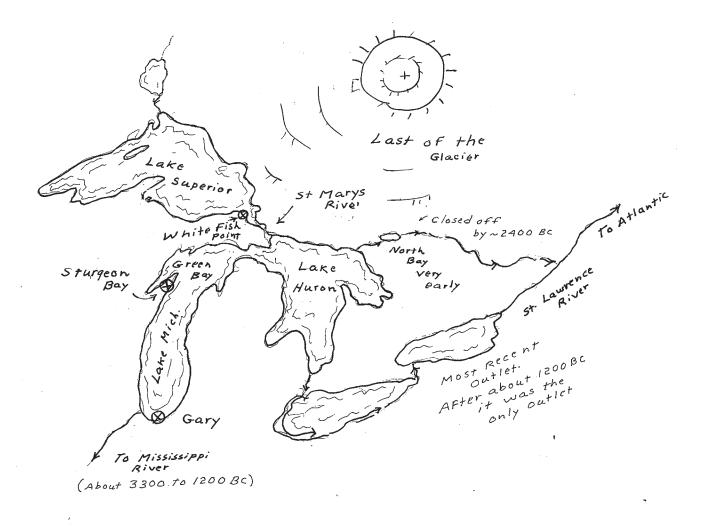


Figure C-6. The three key locations with good data on ancient beaches (Whitefish Point, Sheboygan, and near Gary, Indiana)

The data for the levels of the Great Lakes, and ancient beaches around them, becomes more complex, because in about 3300 BC (maximum Lake Nipissing Stage) the water of Lake Superior, Lake Huron, and Lake Michigan were all one giant water body. But that changed over the centuries. The lake shores all around Lake Nipissing rose until about 23 centuries ago, when the St. Marys River cut off the water of Lake Superior from Lake Huron and Lake Michigan. Thereafter, Lake Superior rose separate from Lake Michigan, just like a puddle above an ancient beach line. Nonetheless, Larsen and his colleagues were able to calculate the "present rate" of uplift in different areas and put the results on graphs such as shown in Figure 9 on page 12 (as things were understood in 1987) and in Figure C-2 (as they were understood in 1994).

## Page C-5

### Linear and Logarithmic Plots of Uplift and Rate of Uplift versus Time:

Figure C-7 shows a hypothetical plot of an ancient beach line, now about 42 feet above the ancient level of Lake Nipissing (relative to an ancient beach line near Gary, Indiana). Assume that we find in Larsen's charts, that the present rate of uplift is 1.1 ft. / century. Using linear math and a linear plot of uplift and rate of uplift versus time, we have the solid line in the upper curve. We calculate that the time when this beach would have been at water level as 42 ft. / 1.1 ft./century = 38 centuries ago. This is 3800 years ago or about 1800 BC. In our plot in Figure C-7, we see that we are using a unchanging rate of uplift (1.1 ft. / century) between the present and 38 centuries ago. But we suspect that this rate was slightly larger in ancient times and will be slightly smaller in centuries to come.

The additional amount of uplift rate suspected in the past is illustrated by the area shown as  $A_1$  in the lower curve. This additional area is also the amount of additional feet that the real beach line would be expected to have been risen in 38 centuries. This is shown as  $\Delta$  in the upper curve.  $\Delta = A_1$ . The real total uplift would be 42 ft. +  $\Delta$ . We will define a correction factor, C, between the value calculated by linear math, and the real value. In this case,

Real Value/ Value from Linear Math =  $C = (42 \text{ ft.} + \Delta) / 42 = 1 + \Delta / 42$ .

We can expect that the same thing would have happened with ancient beaches near the Ship Petroglyph Site near Copper Harbor, but with some other number than 42.

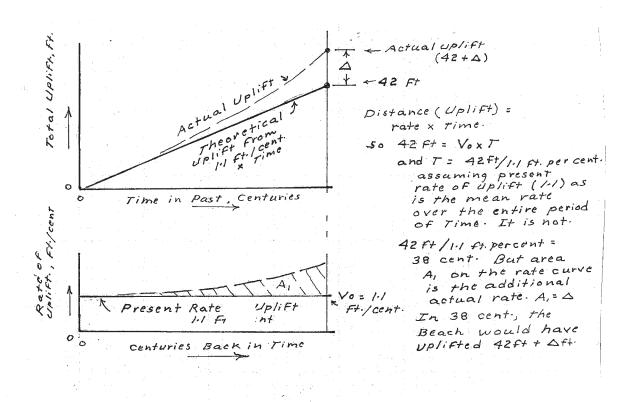


Figure C-7. A hypothetical ancient beach line analyzed assuming present rate of uplift, and an indication of the real rate of uplift

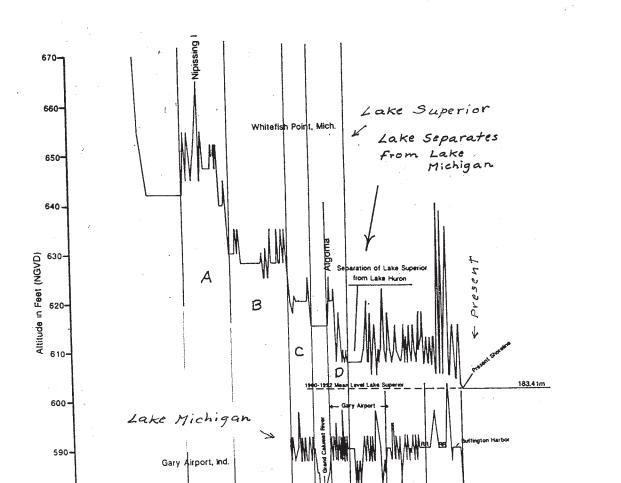
#### **Practical Use of Derived Curves**

Note that the way the data is presented in Figure C-7, the **total uplift** (D) is in the <u>upper curve</u>, and the **rate** of uplift (R) is in the <u>lower curve</u>. The rate is the derivative of uplift with respect to time (d (D) /dT). These two curves comprise what in engineering are called "derived curves", where each curve to the bottom is the derivative of the upper curve. We will only be using two curves, the first for the total uplift (D) and the lower curve for the rate of uplift or the change in D with respect to time (T). Between any two points on this pair of curves, the area under the lower curve is equal to the change in the y value of the upper curve. The total uplift (no matter how complex the curves) is equal to the area under the curve for the rate. Also the mean rate of uplift is equal to the area under the rate curve divided by T.

The data which we will use to adjust the present rate of uplift at Copper Harbor to the mean rate will come from detailed studies of ancient beaches at Whitefish Point in Figure C-8. (This site has about the same rate of uplift as at Copper Harbor.) At Whitefish Point, a large number of ratio-carbon dates of ancient beach lines were compared to their present elevations on USGS 7.5 min Topo Maps. At that time, precise GPS was not available for determining precise elevations. These elevations were determined from the 10 ft. contour lines on the topo maps. The rules for making such maps stated that at least 50% of points should fall within 1/2 of the correct contour interval, and that no point should be more than 1 contour interval from its more precise value. To me, the greatest suspected error in the data that we will examine in Figure C-8 is in the individual elevations of the points where the radio-carbon dates were taken. I would expect that these points would have mean errors in elevation of about 4 feet or more.

By using statistics which we taught in our surveying classes, we can reduce the probable error (of about 4 feet) to smaller values by lumping the values together into brackets of time, and taking the mean and standard deviation of all the values in a time bracket (i.e., calculating the mean and standard deviation for the data set). The rules of statistics say that if we determine the mean of, say, 16 points, then the mean of these values will be much closer to the real mean than by using one or a few points. The probable error of the mean (how far the mean is from the real mean value) is determined from the standard deviation divided by the square root of the number of values in the bracket. In this case, if the error in the data set (standard deviation) was 4 ft., then the error of the mean would be  $4 \div \sqrt{16} = 4/4 = 1$  ft.

In Figure C-9, for Lake Superior, the time between present (actually 1994) and 56.5 centuries into the past was divided into time brackets shown as A, B, C, and D. Between time bracket D and the present, the data is unreliable because it is during the time when Lake Superior separated from the rest of Lake Nipissing (and Lake Michigan) with the St. Mary's River. The area between C and D (about 28 to 31 centuries ago) also seemed possibly contaminated. For our immediate purposes, both the brackets C and D are too small for our calculations, so they will be combined into a new bracket called C--D. 10



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175.49m

Thousands of years

Figure C-8. Elevation data from ancient beach lines at Whitefish Point (from Figure 9, Scherz 2000, and modified from Larsen, 1994, p. 121)

580

Figure C-9 shows the individual elevations which were scaled from the chart in Figure C-8 within all the selected time brackets. Within these time brackets, the mean elevation, standard deviation, and the error of the mean were calculated. For the middle of each time bracket, the uplift of the mean elevation was calculated above a datum elevation of 579 ft., the level of Lake Michigan (and also ancient Lake Nipissing) at Gary, Indiana.

The data in Figure C-9 were reduced for purposes other than our immediate concerns. For our work, the short time periods of C and D (separated by a time of possibly contaminated data) are much too short and inappropriate for our calculations. Consequently, I have made one longer time bracket called C--D from the old short time brackets C and D. This conversion of data is shown in Figure C-9a.

Figure C-8 comes from a working paper prepared in 2000, where I tried to make sense of the then new GPS data collected by the Wisconsin Department of Transportation. What at first appeared as errors in the GPS data, really were measurements of the deforming earth, due to isostatic adjustment. I was particularly interested in a trench of subsidence that appeared between the uplift area and the forebulge area in the state. The mysterious lake known as Lake Mills, with its reported underwater pyramid, is located along this trench of local extreme subsidence.

# Determining mean elevations, standard deviations, and error of the mean for selected time periods at Whitefish Point

Time -> Period ->	<u>A</u>	<u>B</u>	C	· <u>D</u>	
Individual  Points  (Elevations  in ft.)	665×/ 655×3 652×3 650×/ 647×4 645×4 644×/ 642×/ 640×2 630×/	635×6 631×1 630×3 627×9 625×3	625x1 621x1 620x4 618x1 615x1	625x1 622x1 620x2 617x1 610x2 607x4	Time Periods:
Mean	697.6	629.5	6/9.9	614.0	A: 56.5 - 47 Cent. B.P.  Mean = 51.8 Cent. B.P.
Standard Deviation	7	4	<b>3</b>	7	B: 47-34, mean 40.5
No. Points	21	22	8	//	C: 34-30, mean 32
Error of Mean	1.5	0.8	1.1	2.1	D: 28-23, mean 25.5
Results	647.6 ± 1.5 Ft	629.5 ±0.8ft	619.9 ± 1.1ft	6/4·0 ± 2·/fr	·

Ave. = I l.A ft.

Total Uplift at Whitefish Point above Mean Level of Lake Michigan (579 ft. Mean Sea Level)

Figure C-9. Calculating mean values, standard deviations, and errors of the mean for elevations and uplift of ancient beach ridges (from Figure C-8)

(modified from Figure 10, Scherz, 2000)

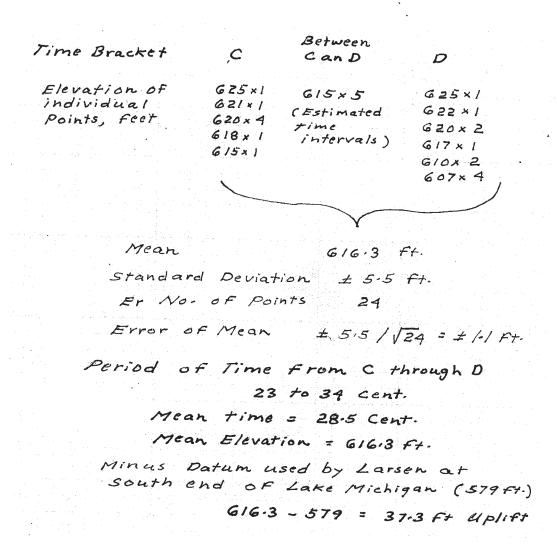


Figure C-9a. Creating a new Time Bracket called C--D from previous time Brackets C and D, and the area in between

Figure C-10 shows the data in Figures C-9 and C-9a plotted in the form we have been using, where the most ancient ages are to the right on the graph. We have also added the lower curve for the rate of uplift, which to some extent we will be able to create from the data shown in the upper curve.

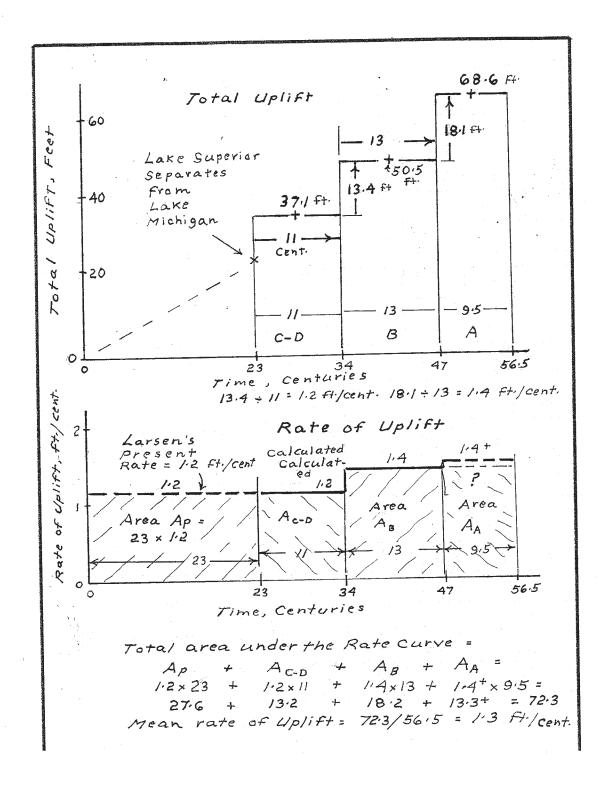


Figure C-10.

Creating the curve for the mean rate of uplift at Whitefish Point (relative to south end of Lake Michigan) from present to about 56.5 centuries ago

Page C-8

In Figure C-10, using derived curves, we calculated the rate of uplift from 23 to 34 centuries ago (bracket C--D) to be 1.2 ft./century. This is also the value we got for the present rate of uplift from Larsen's chart from 1994 (Figure C-2). For the period 34 to 47 centuries ago (B racket B) we calculated a rate of 1.4 ft. / century. This is slightly higher than the rate given by Larsen and the rate in time bracket C--D. We have no way of precisely determining the rate of uplift in time bracket A, 47 to 56.5 centuries ago. It will be at least 1.4, and likely a bit higher. For future calculations, we will be conservative and use the rate of 1.4 also through time bracket A (as well as for time bracket B).

The mean rate of uplift for the period from present to 56.5 centuries ago will be the area under the lower curve (the rate value) divided by the total time period of 56.5 centuries. The area under the rate curve from present to 23 centuries ago (area  $A_P$ ) is 23 x 1.2 = 27.6. The area shown as  $A_{C-D}$ (from 23 to 34 centuries ago ) is 1.2 x 11 = 13.2. The area shown as  $A_B$  (time bracket B) is 1.4 x 13 centuries or about 18.1. We will assume that the area under the rate curve for time bracket A (area  $A_A$ ) is 1.4 x 9.5 = 13.3 (and likely a bit more). The total area under the rate curve from present to 56.5 centuries ago is 27.6 + 13.2 + 18.1 + 13.3 + = 72.2 +. The mean rate of uplift during this time is 72.2 +/56.5 = 1.28+, say 1.3 ft. / century (and probably a bit larger). Note that the present rate of uplift for Whitefish Point as given by Larsen is 1.2 ft./ century. With this data, we can calculate the correction factor as 1.3 / 1.2 = 1.08 = mean rate of uplift / present rate of uplift.

We can also calculate the correction factor by a completely different method. Figure C-11 shows the values of uplift for the centers of the time brackets A, B, C, D, and C--D plotted on both a logarithmic and on a linear scale. The plots indicate that the curves should hit the y axis at about 22 ft. This is approximately the present elevation of Lake Superior above the south end of old Lake Nipissing, and also now the south end of Lake Michigan, which has an elevation of 579 ft.,MSL. (Lake Superior separated from Lake Michigan about 22 to 23 centuries ago.) Note that 22 ft. + 579 ft. = 601 ft., and that we take the present elevation of Lake Superior to be about 602 ft.

The data from time brackets A, B, C, D, and C--D are useful points derived from the ancient beaches at Whitefish Point. All data from after about 23 centuries ago when Lake Superior separated from Lake Michigan (as taken from Whitefish Point in Lake Superior) are not useful in our plot. But the value of zero is. By definition, the uplift of a beach referenced to the present time is zero. We will assume ancient Lake Nipissing. We can use zero uplift for the present elevation of the south end of Lake Michigan, which is the datum set up by Larsen to do his calculations and make his charts for the uplift of Lake Nipissing and the other lakes.

In Figure C-11, the uplift for the center of the A time bracket is 68.6 ft. The time is 51.8 centuries ago. The average effective rate of uplift over this period of time has to be 68.6 ft. / 51.8 centuries = 1.32, say, 1.3 ft. / century. From the charts of Larsen (1994) we get the present rate of uplift as 1.2 ft./ century. The correction factor for this bit of data is 1.32 / 1.2 = 1.1 (or 1.3 / 1.2 = 1.08). This is the same value we got from analyzing the derived curves above.

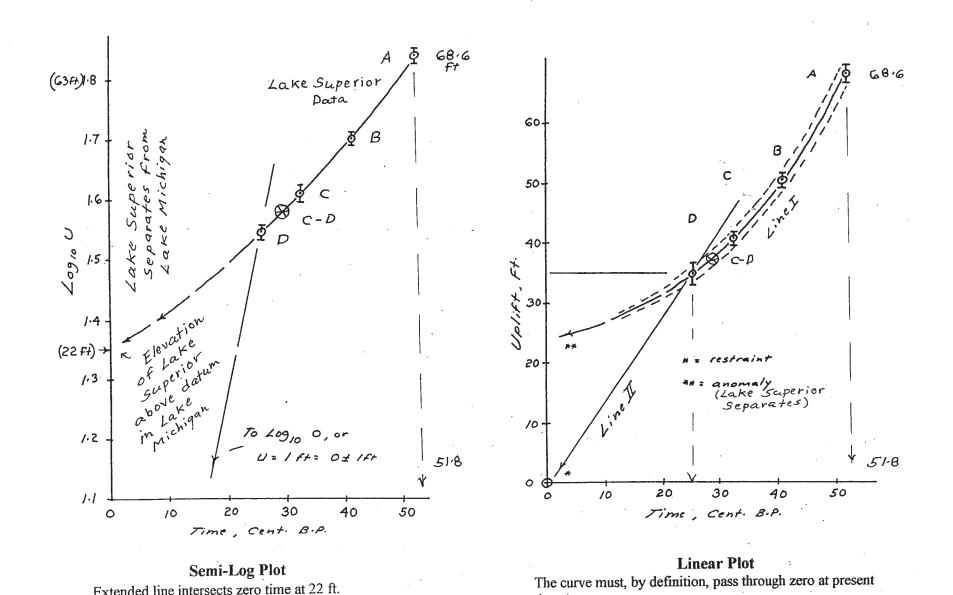


Figure C-11.
Uplift at Whitefish Point Relative to Lake Michigan

time.

Extended line intersects zero time at 22 ft.

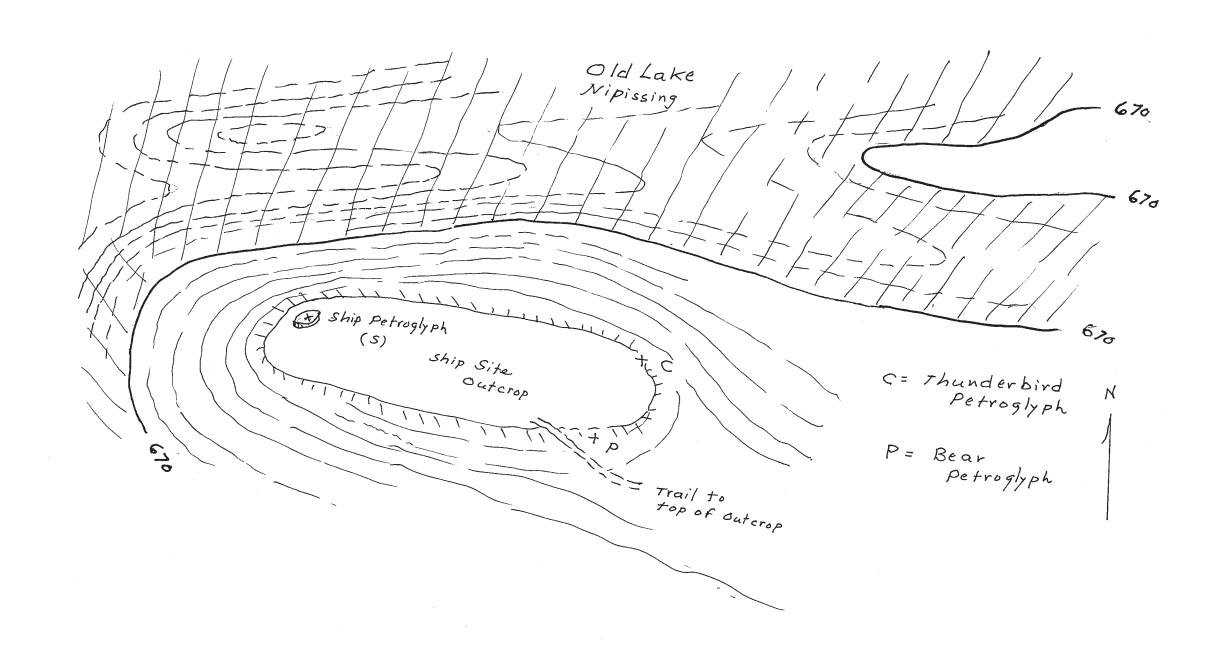
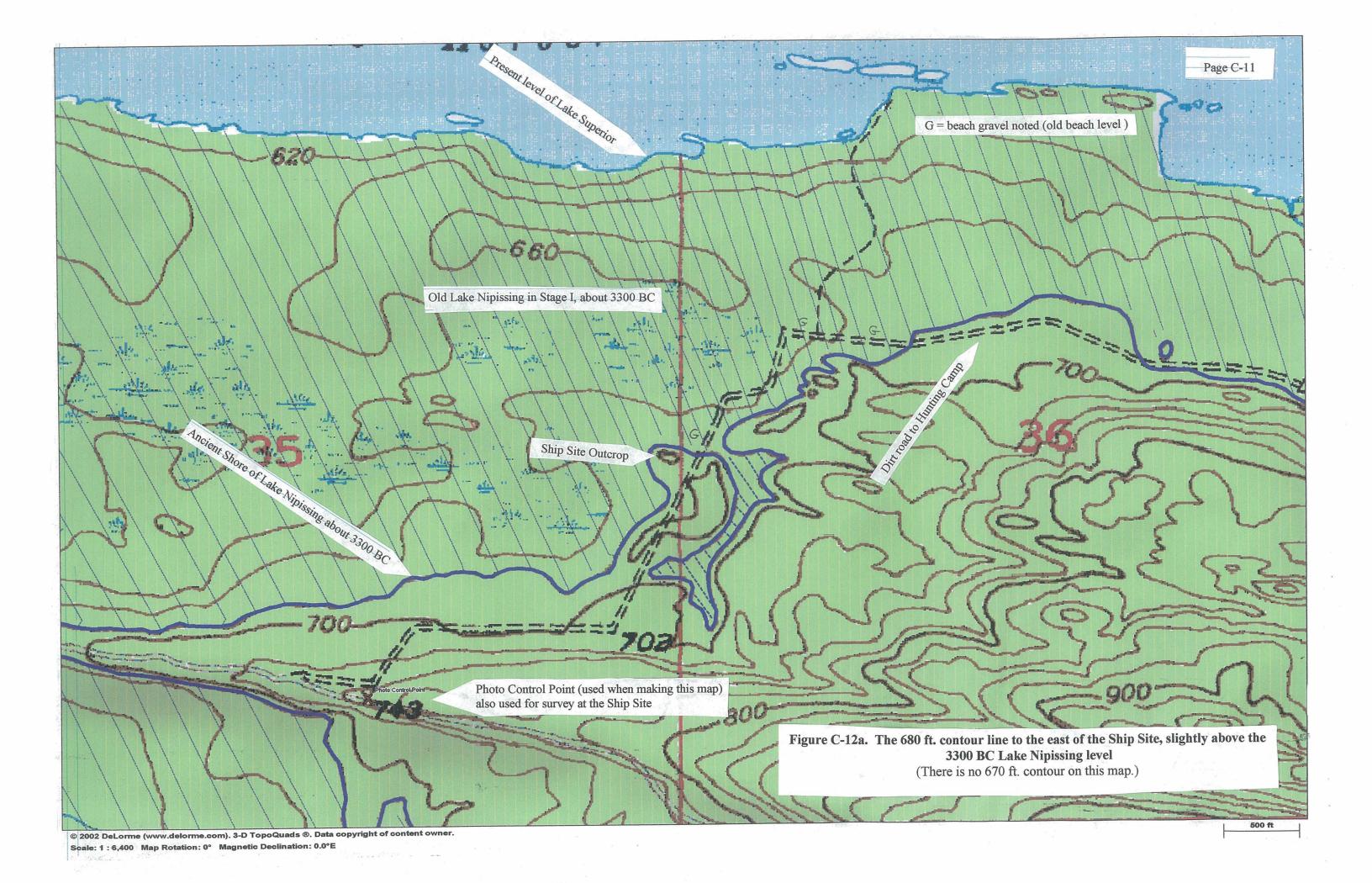


Figure C-12. The 670 ft. contour line at the Ship Site (approximate water level about 3300 BC)



#### Page C-12

#### **Selected References:**

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- Larsen, Curtis E., 1987: "Geological History of Glacial Lake Algonquin and the Upper Great Lakes", U.S. Geological Survey Bulletin 1801, U.S. Government Printing Office.
- Larsen, Curtis E., 1994; "Beach Ridges as Monitors of Isostatic Uplift in the Upper Great Lakes", Journal of Great Lakes Research, Vol. 20, No. 1, International Association for Great Lakes Research.
- Scherz, James P.; January, 2000; "Vertical Deformation of the Earth in Wisconsin -- A Comparison of Ancient Beach Ridges and GPS Survey Data--"; meant to be a working paper, locally printed and distributed.
- Scherz, James P.; July, 1999; "Old Water Levels and Waterways During the Ancient Copper Mining Era (about 3000 BC to 1000 BC", pamphlet locally printed and widely distributed at special meetings.
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## Appendix D

## Sunset Calendar Observations Possible from the Ship Petroglyph Site

James P. Scherz Sept., 2013

My experience has been that at the major effigy mound groups, or other ancient sites comprised of organized rocks, one will find some important calendar function in the geometry, if we take time to look, and if the important parts have not been destroyed by modern man. If we find possible alignments, the time of year to which such alignments correlate indicates what time of the year the site was probably most used. Common alignments are to the rising or setting sun on the solstices, a month (or lunation) before and after the solstices, on the equinoxes, and at the ancient cross-quarter day periods (midway between the solstices and equinoxes). Most of the principle alignments in the north, near Lake Superior will function in the summer months. Summer solstice is common, on the autumnal equinox, fall cross-quarter day period, and alignments essentially ending by mid November-- a good time to leave this area on a migration to warmer, southern climates.

Near Lake Superior, the summers are pleasant and warm. But in the winters, the snow is measured in feet and not inches. Many ancient people would likely have migrated south for the cold and snowy winter months, especially in days before supermarkets for food. It should be no surprise that probable calendar functions found in most ancient sites in this region are to the sumrise and sunset on the summer solstice, on what can be the summer cross quarter day, fall equinox, and the fall cross-quarter period (about 1 Nov., corresponding to our Halloween and All Saints Day period). Especially for people traveling by water craft, it would have been necessary to know when cold weather was approaching to avoid the early storms and snow that begins to fall in late November. We know that many modern people who live near Lake Superior move south for the winter months (we use our calendars to plan the trip). It would have been no different in centuries past, and even more important then. But they had no drug-store calendar, and some wise ones in the group would determine the time of the year by watching where the sun rose or set on the horizon, during its north to south travel after the summer solstice.

We do not have to just hypothesize that ancient people made migrations south to north . in the spring and from north to south in the fall. We know that it happened, from early historical documents and from verbal histories. Fred Rydholm once talked about the "Noqua" Indians (some who, he said, still live in Marquette, Michigan, and are counted as part of the Chippewas in the government records). He said that their winter home was Bay de Noc, north of Green Bay. Their summer homes were much further north.

Similarly, it is known that the Sauk Indians had summer villages near Sauk City and Prairie du Sac, in Sauk County, Wisconsin. But they had winter homes near Rock Island, Illinois. They made a yearly migration between winter and summer homes, between 100 and 200 miles along the trails and waterways. If we take this north-south yearly migration as a norm for ancient people with their families (not necessarily the professional traders in their large boats who moved much further) then we would expect that many ancient native people who lived with

their families on the south shores of Lake Superior in the summer (and possibly helped work in the copper mines there) would be a few hundred miles further south in the winter. This could be in Wisconsin, even southern Wisconsin. In southern Wisconsin, one still finds snow in the winter months, But it is measured in inches and not feet. It would have been a much easier place to spend the winter months than near Lake Superior.

## Some Apparent Calendar Alignments in Southern Wisconsin:

Figure 1 shows alignments to the setting sun on the equinoxes, fall cross-quarter day period, winter solstice, and on the winter cross-quarter day period (our Ground Hog's Day). This is at the Hensler Site in southern Wisconsin. There are numerous other sites in southern Wisconsin which also have functional alignments during the same times as shown in Figure 1. There are also some observable apparent calendar sites in southern Wisconsin (such as at Frank's Hill, north of Muscoda) which will also function in the summer months as well.<sup>13</sup>

But the majority of apparent ancient calendar sites in southern Wisconsin clearly function in the winter months. This is also true of the sunrise calendar function that one can witness at Aztalan, with the observer wandering over the mounds at Aztalan Park. From the tallest and northernmost round mound at Aztalan, the sun can be seen to rise over Christmas Hill about a mile to the southeast on the winter solstice. There is a pit and a single mound atop Christmas Hill, where if a light is held there (or a fire in ancient times) you can see the sun rise over it on the winter solstice. The place name of "Christmas Hill" (from early explorers who got the name from the natives) also tells us something. These numerous alignments to the rising or setting sun, in the winter months in southern Wisconsin, are well documented in other reports, and we need not take space here. The data shown in Figure 1 for the Hensler Site will suffice.

#### Some apparent calendar alignments near Lake Superior:

As previously shown, there are possible calendar functions between the four large mounds, once on an island near Mummy Mountain on the Huron Mountain Club in northern Michigan. See Figure 12 and Figure 12a. It is unlikely that ancient visitors would have gotten to the site with water craft by the spring cross-quarter day period, about May Day. But there are strong and clear alignments to the rising sun on the summer solstice, the summer cross-quarter day period (early August) and on about 22 August, a month or lunation before the fall or autumnal equinox. After about a month before the fall equinox, the ancient sun watcher would likely have moved to near the Stone Face on the natural flat bench on the east side of Mummy Mountain (Figures 12, 12a, and 12 c). There, alignments are at the Equinox, to about 14 Nov.

The remarkable site known as Franks Hill is locally called an "agricultural calendar" because, from the highest observational point on top of a western hill (atop a shaped mound which looks like a bird) one can watch the sun set over the southernmost of 12 conical mounds on a distant ridge on about the spring cross quarter day (May Day). (The number 12 suggests a solar calendar with 12 months or lunations in the solar year). May Day is a good time to begin preparing the fields in this part of the country. We can watch the setting sun migrate northward over the 12 conical mounds until it sets over the northernmost conical mound on the summer solstice (when the day is longest and when plant growth is at its maximum). After the solstice (which means "sun stand still") the setting sun migrates back to the south. It sets again over the southernmost conical mound on the summer cross-quarter day period in early August (celebrated elsewhere as Lammas Day, the First Fruits or Green Corn Ceremonies, etc. Green corn to eat from the fields can be expected by this time).

At the Stone Face, as shown in Figure 12c, an ancient calendar keeper could have used a small perched rock, part way up the outcrop to the west (Rock A, Fig 12c) the Stone Face (Rock F) and other clearly man-placed rocks on this stone bench to keep track of time. Time could have been traced from the fall equinox to the fall cross-quarter day and a fortnight later (on to about 14 Nov.) Note that this possible sunrise calendar functions end after 14 Nov., suggesting that any ancient calendar keepers at this site had vacated the area by this time of the year.

Northwest of Mummy Mountain on Huron Mountain is another site that we should consider. It relates to the dolmen which Fred Rydolm talked so much about. Dolmens are often associated with water navigation at other sites. And Huron Mountain is one of the most notable landmarks on the southern side of Lake Superior. Modern sailors still use it as a definable landmark, easily recognized (similar to the natural landmark near the Old Fort on the north side of the lake).

But the Huron Mountain Dolmen is on the south side of the mountain. It can not be seen from the water, and you cannot see Lake Superior from the Huron Mountain Dolmen. We pondered what its purpose here might have been. A careful survey of the area around the dolmen and obviously perched rocks (not there from normal erosion) gave an answer. Figure D-1 shows Fred near the Huron Mountain Dolmen, and a large pointed boulder propped up with small rocks near by. It is readily seen, as is the Dolmen, when on this part of the mountain.

Where the Huron Mountain Dolmen was placed, relative to a giant boulder, and other perched rocks, directs attention towards the west and southwest. (See Figure D-2.) To the west, we see two notches in the horizon, many miles away. As shown in Figure D-2, the sun will set over the northern notch (Alignment A in Figure D-2) on the Autumnal Equinox (about 21 Sept.) It sets over a more prominent alignment to the south on about 30 Oct. (the beginning of the ancient fall cross-quarter day period of several days, which we celebrate as Halloween to All Saints Day). Within an ancient fortnight (14 days) after this sunset, the prudent ancient sailor would likely have left this region for the year, to areas with less severe winters.

#### You Can Determine When the Autumnal Equinox has passed from the Ship Site.

When we first visited the Ship Petroglyph Site in 2008, I tried to read the arrow rocks (before they got moved) for clues of how the ancient site might have been used. Figure 4 in Appendix A shows a sketch from my field notebook. Some of the lighter colored pointed arrow rocks could then be used as guides up the incline to the petroglyphs. But other arrow rocks, especially the most prominent one, three feet long and propped up on smaller rocks, like a miniature dolmen, points due west (Rock Rp in Figures 7a and 8a). Naturally, a person will look in this direction—to the west. Due west is another rock RK3, over the lip of the outcrop (Figures 7a, 8, and D-4) Therefore, a due east—west line, associated with the equinoxes, is at the site.

And due west to the horizon, one sees the very prominent terrain feature on the edge of the lake, today called Brockway Mountain. Just to the south of it is another prominence which can be traced to Rocky Ridge, about 7 miles away. Figure D-3 shows a presentation from the computer program DeLorme Topo USA, which shows a view west of the Ship Site in early days when the level of the lake was near its maximum (about 3300 to 3000 BC).

Figure D-3 illustrates the setting sun on the Autumnal Equinox, and about 14 days later on about 5 Oct.. With a bit of practice, one should be able to set the daily solar calendar count (from the equinoxes) between the Ship Site and Brockway Mountain to the nearest day or so.

Page D-2



The Dolmen atop Huron Mountain



A perched rock associated with the Dolmen atop Huron Mountain. See Figure D-2 for alignments.

Figure D-1. Fred Rydholm and the Huron Mountain Dolmen

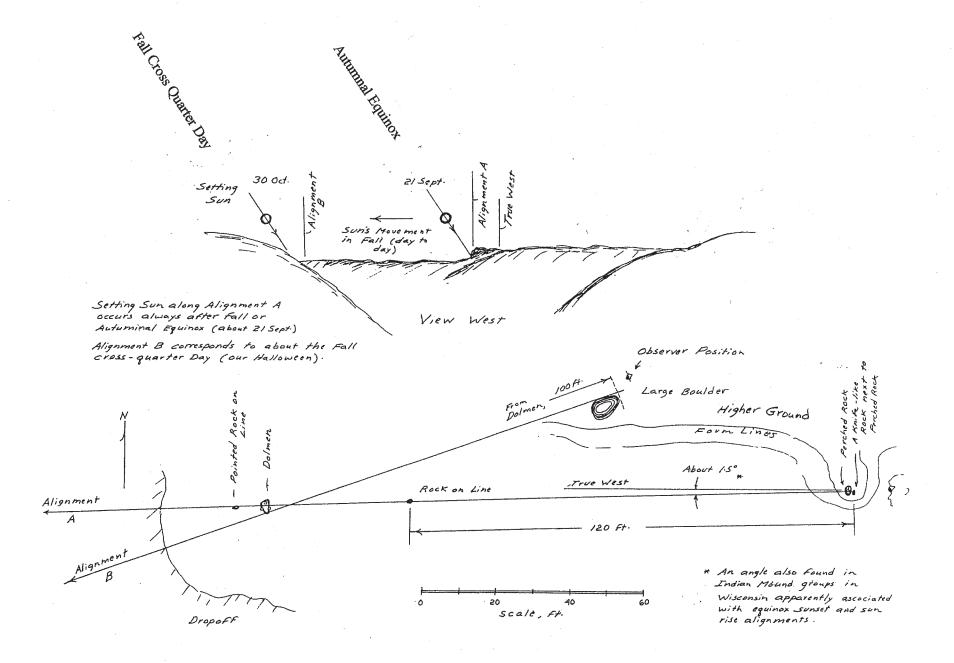
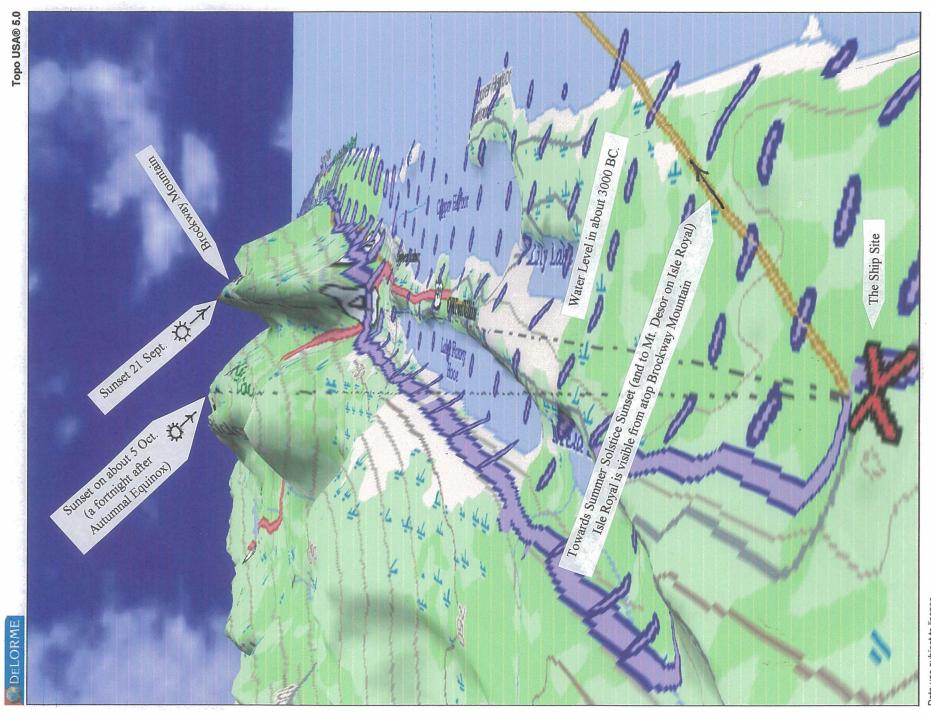


Figure D-2. Observable Calendar Alignments associated with the Huron Mountain Dolmen

These features could function as a solar calendar site at the fall or autumnal equinox (official first day of fall) and on about the fall cross-quarter day, midway between the autumnal equinox and with winter solstice (also associated with our Halloween).



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Elevations exaggerated

Figure D-3. Sunset from the Ship Site Outcrop on the Fall Equinox

# A Glance at Information Encoded by the Ancient Secret Priesthoods:

When surveying the effigy mounds at Lizard Mound Park in southern Wisconsin, we were met by a native elder who said he had been trained in the ancient Fire Lodge, which then still existed on the Menominee Reservation. He said that I should call him Pamita, his lodge name. He was careful not to openly divulge material which he had been sworn not to tell the non-initiated (similar to with Masonic Lodges). But he readily gave me clues for my own study into the geometry of the effigy mounds.

Pamita said that the key geometry is not necessarily open for the average person to see. He said that it had been encoded, so that the information would be available to the initiated priests, but would be readily overlooked by the common man (or woman). He said that the commoners did not understand the important geometry, even at the time people carried earth to build the mounds. He said to pay particular attention to special rocks, which by their shape bring to mind a certain idea. Pamita said that the people who laboriously built the mounds would not have casually left any rock on top of them. If one finds a rock atop a mound, it would have been left there for a specific purpose. He called such visual clues "Toths"— which I thought most interesting. By using the Toths, he said, the initiated priests could read the mounds and access the important useful geometry, which they wanted to keep to themselves.

Over decades of surveying effigy mound groups and related sites (where the geometry is only represented by cairns and special shaped rocks) I have come to realize that the most important information which the ancient surveyors left for us is related to the true north-south directions. Knowing this, one can easily establish true east-west where the sun will rise and set on the equinoxes (a date which surveyors still use as the beginning of the celestial year for their star tables). But this most important true north-south direction is almost never openly shown. It is encoded in the geometry. True north can be established by simple rope geometry from a key alignment of 60 deg. in southern Wisconsin. As we move to northern Wisconsin and into Michigan, the key angle is 45 deg. or 45 deg. bisected. (See Scherz, April, 2009.) Only at a very few apparently special sites is the important true north-south direction precisely shown in the geometry. One such site is at the Dolmen Site, at an ancient portage area between the waters of Lake Superior and the waters of Hudson Bay.

Similarly, the true east-west direction is also almost never openly shown in such sites. As with the true north-south line at the special Dolmen Site, so also at just a few very special sites, we find a true east-west line in the geometry. One such site is the Ship Site. The key observation point for this line is the large arrow rock Rp, which is really a three foot long arrow boulder perched up on smaller rocks, like a mini-dolmen. (Unlike the Minnesota Dolmen, which is too heavy to be toppled by Boy Scouts, who have tried, the dolmen-like arrow rock at the Ship Site could be easily destroyed by school children, if the site is not properly protected.) The arrow rock Rp appears to point generally true west. This alignment seems to pass through a special rock R3 about 40 feet away. But this is far too short a distance for any useful precise geometry. Yet, if we extend the line further over the western crest of the outcrop, we come to the prominent arrow rock RK3 which points back east. This is a longer line, where the geometry will be more useful and precise. (The direction was measured as true east-west within the errors of my protractor.)

But to use this precise line, one must have a person with a tall pole or flag walk over the western crest of the outcrop to define its position. Therefore, this geometry is also partly encoded or hidden. This is parallel to how the deep pothole ground into the bedrock on the western end of the Hensler Site is similarly hidden in view from the casual visitor walking on top of this outcrop. This rock pothole is the most important forward alignment point at the Hensler Site. It is the forward point for sunset alignments on the winter solstice, fall and winter cross-quarter day periods, the southernmost set of the moon, etc. But it can only be used with the help of a person with a tall pole or flag. See Figure D-6.

As shown in Figure D-4, even if we did not know that we could use the peak of Brockway Mountain to determine the time of the equinoxes, we could also do so by using the prominent arrow rock Rp and the far western rock RK3. The equinox sun will set westward over this line. The equinox sun will also rise eastward on the line between these two special rocks.

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Of course, we could also determine given dates in late summer by placing a person with a flag at the Ship Petroglyph and observing sunset from near the Bear Petroglyph, the Arrow Rock Rp, and from the Thunderbird Petroglyph. The dates are about 11 Aug. (also about 1-2 May in the spring which is a cross-quarter day) about 31 Aug. to 1 Sept., and 7 Sept., respectively. See Figure D-4.

Figure D-5 shows results of our year- long study of the geometry at the Hensler Site in southern Wisconsin. According to Prof. Steinbring, this site was continually used for ceremonies from about 8500 BC to about AD 1200. The old marker tree on line to the winter solstice sunset suggests that it was still in some native person's memory until a century or more ago. It could well have been a member of the Bear Clan, who I understand from a HoChunk elder were responsible for making marker trees associated with ancient sites, as the Park Service is responsible for our historical sites. Figure D-6 indicates how the true cardinal directions (true north-south and true east-west) can be established from a key alignment using rope geometry (60 deg. and 30 deg.).

Figure D-6 also illustrates how a person with a tall pole or flag could have accessed the important large pothole on the southwestern end of the Hensler Site (over the lip of the outcrop). This is parallel to how a person with a tall pole would also have been required to indicate from the Arrow Rock Rp where the hidden arrow rock RK3 is located at the Ship Site. Figures D-7 and D-5 illustrate how sunset alignments at different parts of the year are possible from prominent rocks or pits on the Hensler outcrop to the large pothole to the southwest.

Figure D-7 illustrates how we determine where the sun (or moon, or Mercury) will set from a true east-west line. It looks complex; but surprisingly, the calculations (although unfamiliar to us) are extremely simple and can all be done with rope geometry (by methods they do not teach in our schools). The same sort of simple (but unfamiliar) geometry will also allow a person to do long range navigation on the round earth without the use of spherical trigonometry (invented by Al Biruni in about AD 1000).

The period apparently used for ceremonies at the Hensler Site covers the time when the copper mines of Lake Superior were worked, and apparently also the time when the Ship Site could have been used by ancient boats and navigators. The geometry encoded in effigy mound groups and special rock-decorated sites in southern Wiscinsin, such as the Hensler Site, is sophisticated enough to also allow an ancient navigator to cross the open seas and return safely back to home port. We know that the ancient seafarers could do exactly this. But we know not how. The geometry encoded in the effigy mounds and other sites in southern Wisconsin show how it could have been done.

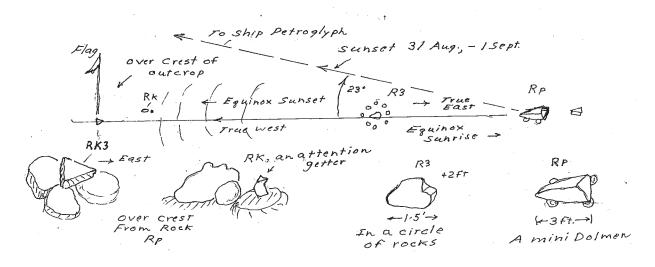
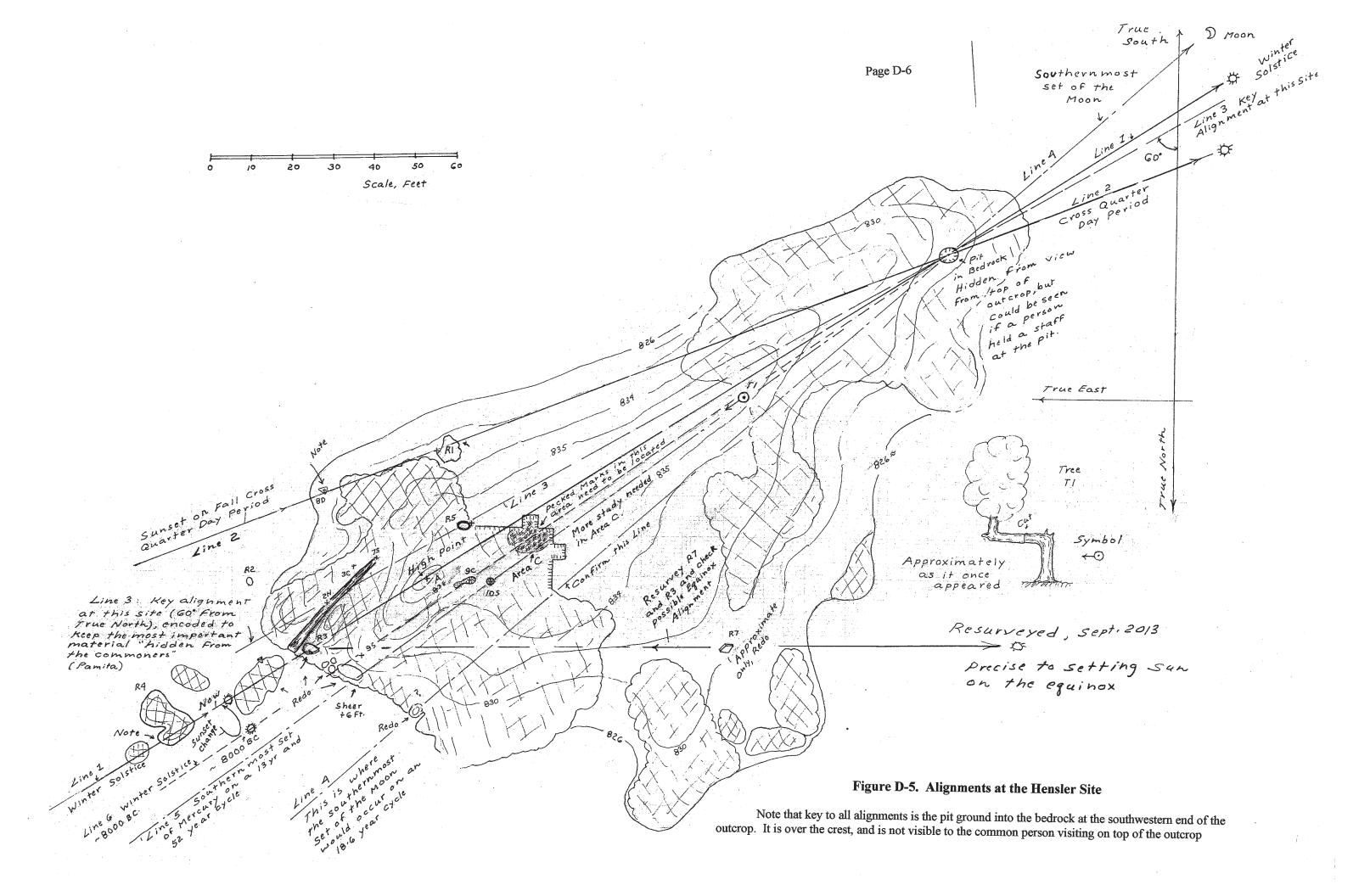


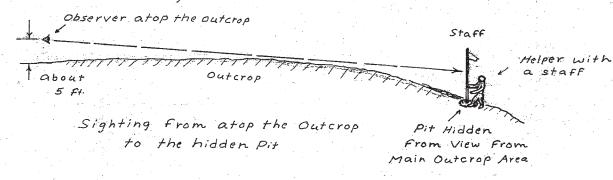
Figure D-4. Equinox Sunset and Sunrise between Arrow Rock Rp and RK3



# Geometry and Possible Calendar Function From Analysis of Preliminary Data From the Hensler Site (2012)

The key single reference Point for geometry and probable calendar function at this site is a Pit at the southwest end of the outcrop, about 2 feet into the bedrock. It is hidden from view to people atop the center of the outcrop. But it can be accessed by a helper at the Pit, holding a staff. Of course, one would first need to know the location of the Pit and that it is important. As with ancient secret priesthoods and Mystery Schools the world over, the most important information was encoded or hidden from the commoners.

As with all such sites, the most important direction is true North-But it is also encoded or hidden. True north can be established using rope geometry by laying off an easily made key angle from a key alignment. In southern wisconsin, the key Angle is 60°. Further north, we find 45° and 45° bisected. Here, the key Alignment is Line 3 from Rock R5 to the Pit. As shown to the right, it is oriented to 60° from true North:

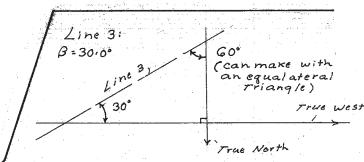


Map Sheet Hen-C1 James P. Schery Jan. 13, 2013

> Latitude of Site: 43° 12.8' = 43.213° = 43.2'

Figure D-6. Accessing an alignment to the hidden pit at the Hensler Site

And also how to create true north-south and true east-west lines using rope geometry from the Key Alignment encoded at the site.



this corresponds to what we call a key alignment with a key angle of 60°, also found at numerous other sites in Southern Wisconsin. Simple rope geometry from this Line can define a true North-South. line without the need of tedious night observations of the northern stars circling the North celistial pole.

\* Most of the petrogly phs appear between Line 3 and Line 1. Are there clues here?

Sun Moon? Northeast

site and the declination of the sun or other heavenly bodies of interest. This geometry can all be done with a drafting

compass and straight edge on the ground or on the deck of a ship