

The Hensler Site and Long-Range Alignments

By

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Overview:

As early as 1990, our maps of the layout of Indian Mounds in the area of Madison and Aztalan indicated the strong possibility of long-range alignments encoded within the geometry of sites and between distant sites. What we noted in this area of southern Wisconsin was not just long range alignments between inter-visible sites, but that these alignments were in the form of Golden Ratio spirals, which in the ancient Old World was said to have been the highest expression of the geometry of nature (being in the construction of the Conch Shell, etc.).

As reported in various AES articles, there are such long-range alignments between the mounds at Aztalan and the mounds atop of Christmas Hill, and to where the sun will rise on the winter solstice. The layout of the mounds on Picnic Point also create a spiral following the natural land form of the point to extend across Lake Mendota to the giant mound group that once existed at Maple Bluff. And Native American stories about Spirit Rock in the swamps of the University Arboretum said that it was tied somehow to the giant Chamberlain Rock atop Observatory Hill in some strange ancient system of long range alignments set up by ancient honored men to tie different sites together. Other stories, such as those told by Pamita, trained in the Menominee Medicine Lodges, said that these so-called Thunderbird Lines from organized rocks in Madison extended to Rock Lake, Sheyboygan, and across Lake Michigan to Beaver Island. Odowa Indians on Beaver Island said that two such ancient Thunderbird lines crossed on Beaver Island, one tying it to Isle Royal where the ancient copper mines are located.

These stories were intriguing. But there was an obvious problem. We can imagine ancient Native American surveyors with range poles and knotted cords laying off long range alignments, even spirals, as modern surveyors lay out spirals for railroads, between inter visible points. But the long-range Golden Ratio alignment between Spirit Rock and Chamberlain Rock went not only to the highest mound across Lake Mendota at the Mendota Site, but also to other important sites many miles north towards the ancient copper mines. Laying out such extremely long cords of the spirals (although not impossible) would hardly have been done by ancient surveyors with range poles and knotted cords, traveling through the woods. Some other ancient surveying method, similar to what we used in the 1800s between distant triangulation hills would have been a possible method. We handle such problems today with values of latitude and longitude, originally set up in this country in the 1800s to control our USGS Topo Quad Maps. Values of latitude and longitude are then calculated by Spherical Trigonometry, invented in about AD 1000 by the Persian genius Al-Biruni, and used ever since.

But we had no evidence that New World surveyors ever used spherical trigonometry, as used by other geodesists around the world. And since we knew of no other method which could handle the necessary aspects of what we call latitude and longitude on the round earth, we merely reported what we found, and did not make a big issue of it, lest we be further ridiculed.

Many years later, Ritchie Brown and I were approached by Ralph Redfox, keeper of ancient star knowledge from the Cheyenne Tribe, with a request that we precisely survey the geometry of the Bighorn Medicine Wheel in Montana. Ralph said that at one time his people were east of the Mississippi, where they had some important ceremonial sites. He knew about these sites, but not their precise location. But he said that their location was encoded in the geometry of the Bighorn Medicine Wheel between special rocks in the Northwest Cairn, the Center Cairn, and the Eastern Cairn. He thought that if we precisely surveyed the wheel, he could find the ancient ceremonial site he was interested in finding.

We surveyed the Bighorn Medicine Wheel, developed computer programs to trace the alignments we found across the landscape, and found the site Ralph was looking for. It is known in the ancient verbal legends as the Home of the White Wolf. It is more popularly known as Eagle Rock. (See the Survey Report for Eagle Rock.) This indicated to me that there indeed was something to the long-range alignments or Thunderbird Lines in the verbal histories. To check whether or not the alignment from the Bighorn Wheel to Eagle Rock was just a lucky coincidence, we used the computer programs developed to support Ralph's request to also check possible long-range alignments from the main avenue at Teotihuacan near Mexico city, which is oriented 15.46 deg. east of due north, and where latitude angles are suggested in the sloping steps of the Temple of the Sun and Moon. There were stories from surveyors in Mexico, that there were once long range alignments between Teotihuacan and important sites in Wisconsin. Again we found meaningful correspondence, even to one of the sites which comes from analyzing the data from the Bighorn Medicine Wheel. (See the Survey Report for Eagle Rock.)

While debugging the computer program developed to trace alignments from the Bighorn Wheel, I came upon a system which would handle the latitude and longitude problem very simply, and without using spherical trigonometry. And the calculations can be all done by the use of ropes, poles, and plumb bobs--tools which the ancient New World surveyors apparently used. Instead of formulae for spherical trig, we have the following simple formula, which I call

Equation 1.

$$\text{Tan of True Bearing Angle} = \frac{\text{Difference in Longitude} \times \text{Cosine of Mean Latitude}}{\text{Difference in Latitude}}$$

This equation can be completely solved with rope geometry, compatible with the ancient methods of graphical solutions before the days of trig and log tables.

But for the scheme to work, the ancient surveyors would also have needed a very precise reference angle of 1.00 deg., divided into smaller workable divisions of minutes, which could be used to measure latitude (the same as nautical miles). This is found at the Hensler Site.

Surveys of the Hensler Site:

In the fall of 2012, several members of the Ancient Earthworks Society (AES) helped me survey the Hensler Site in southern Wisconsin, at the invitation of Prof. Jack Steinbring, former chair of Archaeology at the University of Winnipeg, but now residing in Ripon, Wisconsin. The site is within an active rock quarry, and access is restricted to Sundays when there is no blasting or other quarry activity.

Under a very restricted time schedule, we surveyed on two days. We mapped the area where Prof. Steinbring and his volunteers had been excavating on top of a loess-covered outcrop which comprises the Hensler Site. We also surveyed the petroglyphs at the site, which are located along a vein of dark schist, a striking feature in the outcrop of quartzite. The preliminary maps have been produced, along with a draft report, to be finished after a final field check.

Historical aerial photos analyzed on a Stereoplotter indicate that the Hensler Site is very strategically located near what would once have been a large (probably natural) crescent-shaped earthen feature, now under a berm constructed by quarry personnel to protect the site. The outcrop (about 15 ft. high) which comprises the Hensler Site, is also of a particular natural form which resembles an animal (likely a rabbit). The vein of dark schist, where the petroglyphs are located, corresponds to the location of the birth channel of this large natural effigy shape.

Prof. Steinbring has found evidence of ceremonies atop the outcrop dating back to about 8000 BC. He reports that the petroglyphs correspond through time to the later Upper Mississippian Period, which also overlaps with the period of the Effigy Mound Culture (about AD 300 to AD 1300). A damaged deformed tree (like an Indian Marker Tree) suggests to me that the site was still in verbal memory to some Native Americans within the past few generations.

We have found at other sites that prime ceremonial function often included observing the sun on the solstices and associated cross-quarter day periods (for example at the complex known as Aztalan and Christmas Hill, at Franks Hill, the Nitschke Site, the Jeffers Petroglyph Site, etc.) And as brought to focus with our work and field trips of 2012, we also see evidence for alignments to where Venus (on an 8 year cycle) and where Mercury (on a 13 year cycle) will set. All the probable alignments to Venus which we have found are to its northernmost set, when it is as close to the earth and most brilliant as it ever gets. But the orientation of the natural land forms at the Hensler Site restrict alignments to the southwest. Consequently, we would not expect to find an alignment to Venus at northernmost set at this site. And we do not. But we do find an alignment corresponding to the southernmost set of Mercury. Like the alignment to the southernmost set of the Sun, this is to the southwest. These alignments can be used today, and would have also worked through the Effigy Mound and Upper Mississippian periods of time.

But back a few centuries into the pre-Christian era (and thousands of years before) the declination of the sun was a bit different, and alignments to the setting sun on the winter solstice would be a bit different than today. One alignment at the Hensler Site was originally a puzzle until we realized that it would correspond to the sunset at the winter solstice in about 8000 BC, to when Prof. Steinbring found evidence of ceremonies where one would have once observed the setting sun on the winter solstice. (See draft maps from the preliminary report.)

Orientation of the Dark Vein of Schist and the Distant Mounds at the Garman Site:

Perhaps the most striking feature at the Hensler Site is the dark vein of schist on which the petroglyphs are located. It is oriented at about 41 deg. south of west, and rises across the quartzite outcrop on its eastern side. It seems to be like a natural alignment feature, which once could have been seen as pointing down a long valley along the Mauneshia River to a distant ridge about four miles away. Here, on top of this ridge, is a line of conical mounds known as the Garman Site of Waterloo. You cannot see down this valley today because a berm around the Hensler Site. But at one time, it would have been clearly possible to have seen fires at the mounds of the Garman Site. We recorded latitude and longitude on either ends of these lines with our handheld GPS units. The indicated error was about ± 15 ft. Using Equation 1, from our analysis of the long-range alignments from the Bighorn Medicine Wheel, I calculated the true bearing angles between the top of the Hensler Site and the line of mounds atop the ridge at the Garman Nature Preserve. A line 41 deg. south of west intersects this line of mounds.

To my utter surprise, I found that the angle between the northernmost mound and the southernmost mound at the Garman Site, when viewed from the Hensler Site, was precisely 1.00 deg. This is the precise reference angle needed to carry out the long-range alignments we postulated to explain what we found when working with Ralph Redfox. Furthermore, I counted 24 mounds on the ridge at the Garman Site. If this is correct, then this symbolizes dividing a precise angle of 1.00 deg. (60 minutes of arc) into 24 divisions, each 2.5 minutes of arc. A division of 60 mounds (corresponding to divisions of 1 minute) would not have been appropriate over this distance. (An angle of 1 minute would have been preferable for the system envisioned for long range surveying, since each minute is by definition a nautical mile.) But a division of 2.5 minutes would also have worked, and would have been a useful division. The angle symbolically subtended by two of these mound would be 2.5 minutes. Using every four mounds, we have 5 minutes. Every eight mounds gives 10 minutes. And twelve mounds defines an angle of 30 minutes of arc, or the observable diameter of the sun or the moon.

The precise alignment from the Hensler Site to the northernmost and southernmost mound at the Garman Site can also be used to define the southernmost set of the moon (both in the Effigy Mound Era, and in very ancient times). But these are not direct alignments, and some rope geometry is required (as indicated in the draft maps and preliminary report). And to use the mounds at the Garman Site, one is forced to address the concept of long-range geometry, which to me seems to be the most important symbolic message encoded at the Hensler Site.

Long-Range Surveying Without Spherical Trigonometry:

Surveyors (with angle and distance measuring equipment) working in an area of less than a mile or so can assume that the area is a flat facet of the round earth. Rules of plane geometry can apply. The same is true for sailors working near ports between points they can clearly see. They also use plane geometry and refer to the system as Plane Sailing. The effect of being on a round earth is less than the errors of measuring on such small areas. But there is a point where the effect of the round earth and the converging of the meridians (true north-south lines) towards the north pole of the earth cannot be ignored, even with crude instruments.

Since the days of Columbus, European sailors have used different methods of dealing with a round earth, and for sailing from one port with a given value of latitude and longitude to another. An ancient saying went like this: "Every sailor knows his latitude, but no sailor knows his longitude." It was not until about the beginning of the 1800s that such navigators at sea could also determine their longitude by use of the precise chronograph. (Now it is by use of GPS satellites.) In the days of Columbus, sailors went north or south until they reached the latitude of the desired port (by observing the altitude of the north star). Then they sailed directly east or west until they made landfall. Historic texts on navigation from the 1800s describe this method as Parallel Sailing. But such texts say that some sailors were also using a method known as Middle Latitude Sailing. On checking the math involved, we find that the method known as Middle Latitude Sailing also used what we call Equation 1. From about AD 1599 on, sailors began using the Mercator Method of Sailing, based on the map projection of Mercator. But from that time until the mid 1800s, the Middle Latitude Sailing Method (our Equation 1) was also being used by some navigators. It was described as an approximate method, which could be made exact with correction tables derived from data from Mercator's calculations.

When we developed Equation 1 in support of long-range alignments from the Bighorn Medicine Wheel, we knew that it worked to the accuracy possible with graphical methods of calculations, but then had no idea that anyone else had also found these mathematical harmonies. But we know that someone in ancient Asia could handle the problem of latitude and longitude on a round earth before AD 1000 when the Persian genius Al-Biruni invented his spherical trigonometry. He was a scientist embedded with the Islamic armies who were then conquering into northern India. There, he found ancient maps for cities along the Silk Road, which had both values of latitude and longitude listed for them. Al-Biruni knew how to determine precise latitude, but had no idea of how to determine difference in longitude. Curious as to whether the ancient maps were correct, he developed what we call spherical trigonometry to check the listed values of longitude. He found them to be correct, with an Asian prime meridian through the ancient Indian college city of Ujjain.

But Al-Biruni never found out how the ancient sages from Asia had determined differences in longitude before he invented spherical trigonometry, which we still use for determining differences in longitude. Pamita (trained in the Menominee lodges) often referred to times when there was an exchange of priesthoods with India. Therefore, we should not be surprised that wise men in the New World, as in India, once could determine differences of longitude without Al-Biruni's spherical trigonometry. If army officers in Wisconsin in the early 1800s had found that Natives of Wisconsin were using what we call Equation 1 to determine differences of longitude between their distant signal hills, they would have been unimpressed. It would have been assumed that this was just the old "approximate" method obtained from the French or British, where it was known as the Middle Latitude Method of Sailing.

But the Middle Latitude Method of Sailing (our Equation 1) was being used evidently as early as 1599 when the Mercator Method began to replace it. How much earlier the method had been used, we do not know. But as Bowditch wrote, we know that the ancient Phoenicians and other early cultures sailed the seas and that they "must" have had some method of navigation. But he had no idea what it was. I propose Equation 1 as a likely ancient method.

Examples of Long-Range Surveying Without Spherical Trigonometry:

The distance between the Hensler Site and the mounds atop of the ridge at the Garman Site is about four statute miles. This is about in the transition zone between where plane geometry can be used and where some form of dealing with the round earth must be employed. Ever since we had discovered Equation 1 while working with the Bighorn Medicine Wheel, I have been using it rather than spherical trig for calculations. Both Equation 1 and spherical trig handle the problem of being on a round, and not a flat earth. Figure 1 shows a sketch of the GPS data collected at the Hensler Site and at the mounds at the Garman Site.

Figure 2 shows how we would calculate the true bearing angle from the Hensler Site to Mound A at the Garman Site, using plane geometry. The tangent of the bearing angle is simply X/Y , where X and Y are in the same units of distance. The value of Y in nautical miles is simply the difference in latitude (2.428 minutes of latitude). In this part of the world, the nautical mile (a minute of latitude arc) is about 6074 statute feet. As shown in Figure 2, the north-south distance between Mound A and the Hensler Site is 2.428 nautical miles or about 2.428 nautical miles \times 6077 statute ft./nautical mile = 14,750 statute ft. (about 2.79 statute miles).

The difference in longitude is 2.984 minutes of longitude. This is shorter than 2.984 minutes of latitude (2.984 nautical miles). Anywhere on earth, a minute of longitude is equal to a minute of latitude \times Cosine of the latitude. So X in nautical miles = $2.984 \times \cos 43^\circ$, 10.385 min. = 2.176 nautical miles. This ratio of shortening (minute of longitude/minute of latitude) is encoded into the dimensions of our USGS Topo Quad Maps. The ratio is also encoded in any of the triangles showing the latitude of sites in the geometry of the effigy mounds, as found at Lizard Mound Park, and numerous other sites.

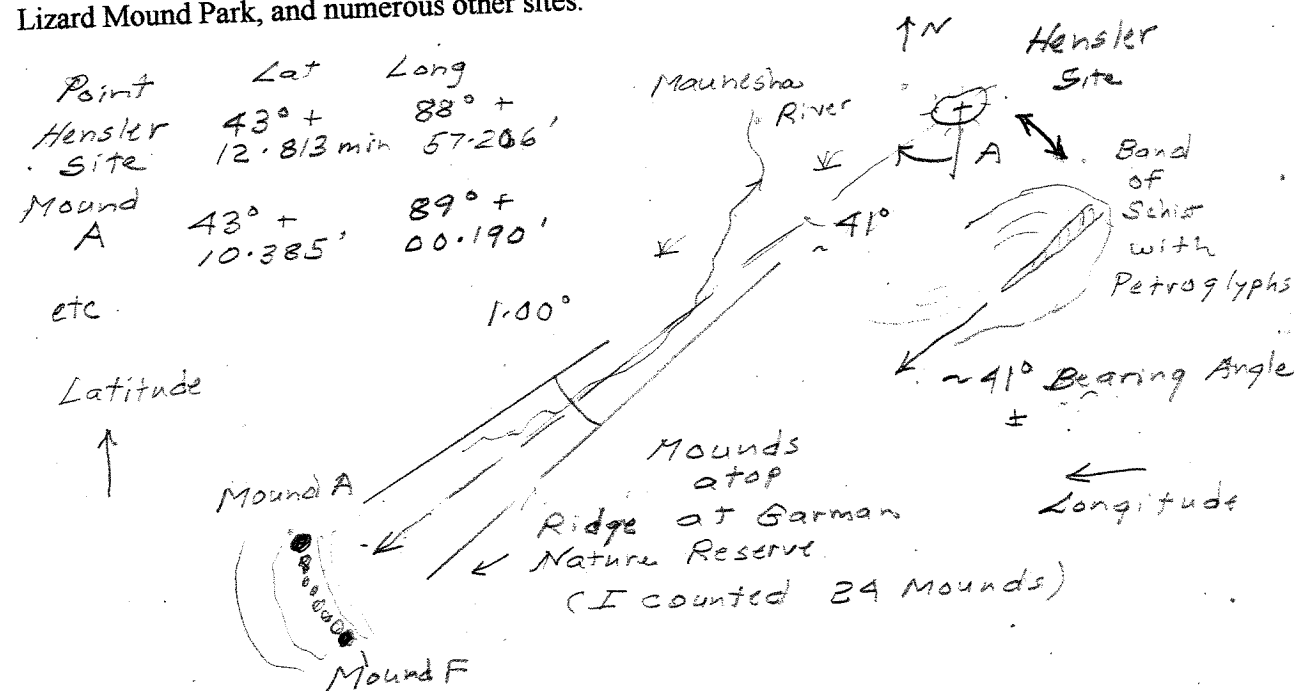


Figure 1. Data from handheld GPS units at the Hensler Site and the Garman Site

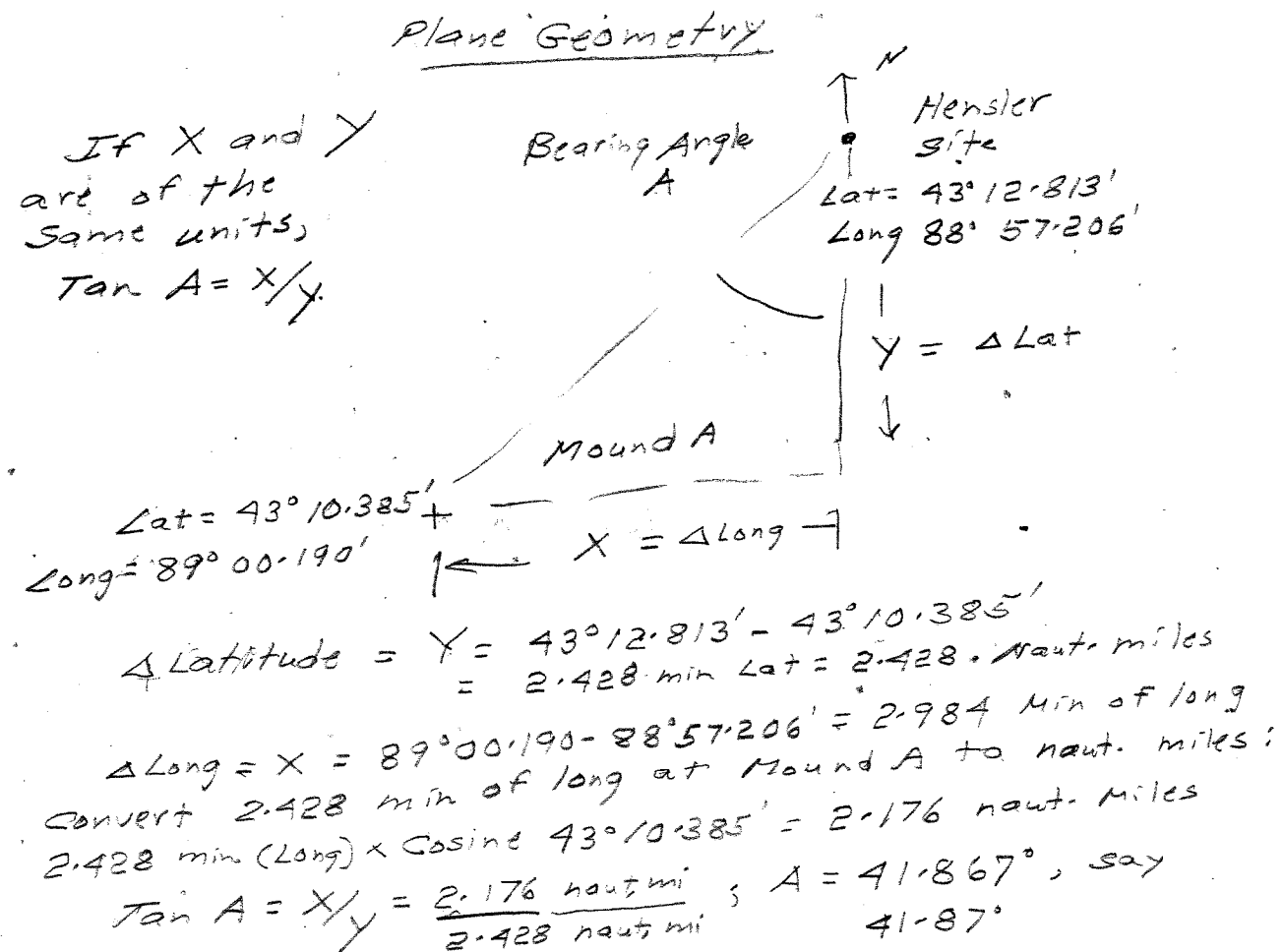


Figure 2. True Bearing between the highest point at the Hensler Site and Mound A at the Garman Site (as calculated by Plane Geometry)

In Figure 2, the first step is to convert the distance X from minutes of longitude to minutes of latitude (nautical miles). 2.984 minutes of longitude $\times \cos 43^\circ$, 10.385 min. = 2.176 nautical miles. With X and Y in the same units of distance, we can calculate the bearing angle (angle A in Figure 2). The tangent of the bearing angle is 2.176 nautical miles / 2.428 nautical miles. Angle A = 41.87 deg. In ancient times before pocket calculators or even trig tables, this calculation could have been done completely by geometry with a protractor and graduated scales (although the results would be less precise than with a pocket calculator).

This method (using plane geometry) is adequate for small areas. For larger areas, we must contend with the effect of earth curvature. I prefer to do so by using Equation 1, which states that

$$\text{Tangent of Bearing Angle} = \frac{(\text{Difference in Longitude}) \times (\text{Cosine of Mean Latitude})}{\text{Difference in Latitude}}$$

Figure 3 shows this slight modification with using a pocket calculator. The calculated true bearing angle is 41.854 deg. (say, 41.85 deg.). As will be shown later, this calculation can also be done completely by use of rope geometry.

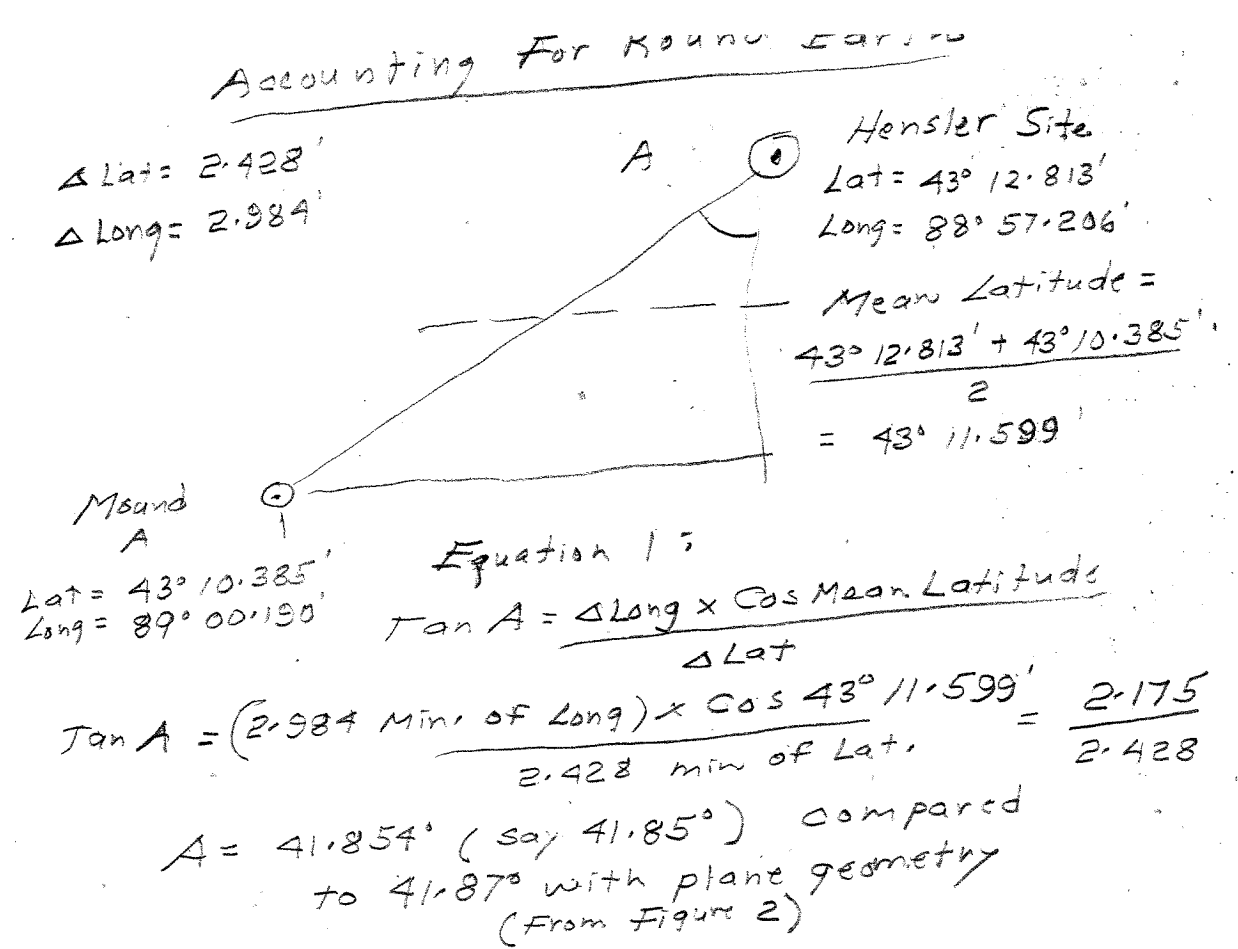


Figure 3. Calculating the True Bearing Angle between the Hensler Site and Mound A by using Equation 1 (which accounts for effect of the round earth)

Hypothetical Example of Extending a Triangulation Network southwestward from Sauk Hill at Devils Lake, Wisconsin

In Figure 4, we have a sketch of long range alignments between the high Sauk Hill at Devils Lake State Park and the distant visible hill to the southwest known as Blue Mounds. There are stories from both the Natives and early White settlers that the Sauk manned such signal hills and routinely sent messages between them by use of mirrors in the daytime and fires at night. We will here assume that these ancient hill keepers also measured the latitude at each site (as with such angles encoded into the geometry of many sites). And we will assume that they also determined true north (key to the geometry of all such sites) and the horizontal angle between a true north-south line and any distant signal hill they could see. In Figure 3 the horizontal angle from Sauk Hill to the station at Blue Mounds shown as 10.50 deg. west of true south.

We will also have to assume that such ancient survey parties met somewhere on the Sauk Plains between Devils Lake and Blue mounds and compared their data (which likely would have been knotted cords of the type that Pamita once talked about). The latitude angles would have been notably different, as shown. The difference in the latitude angles is the difference in latitude (in nautical miles) between the two sites.

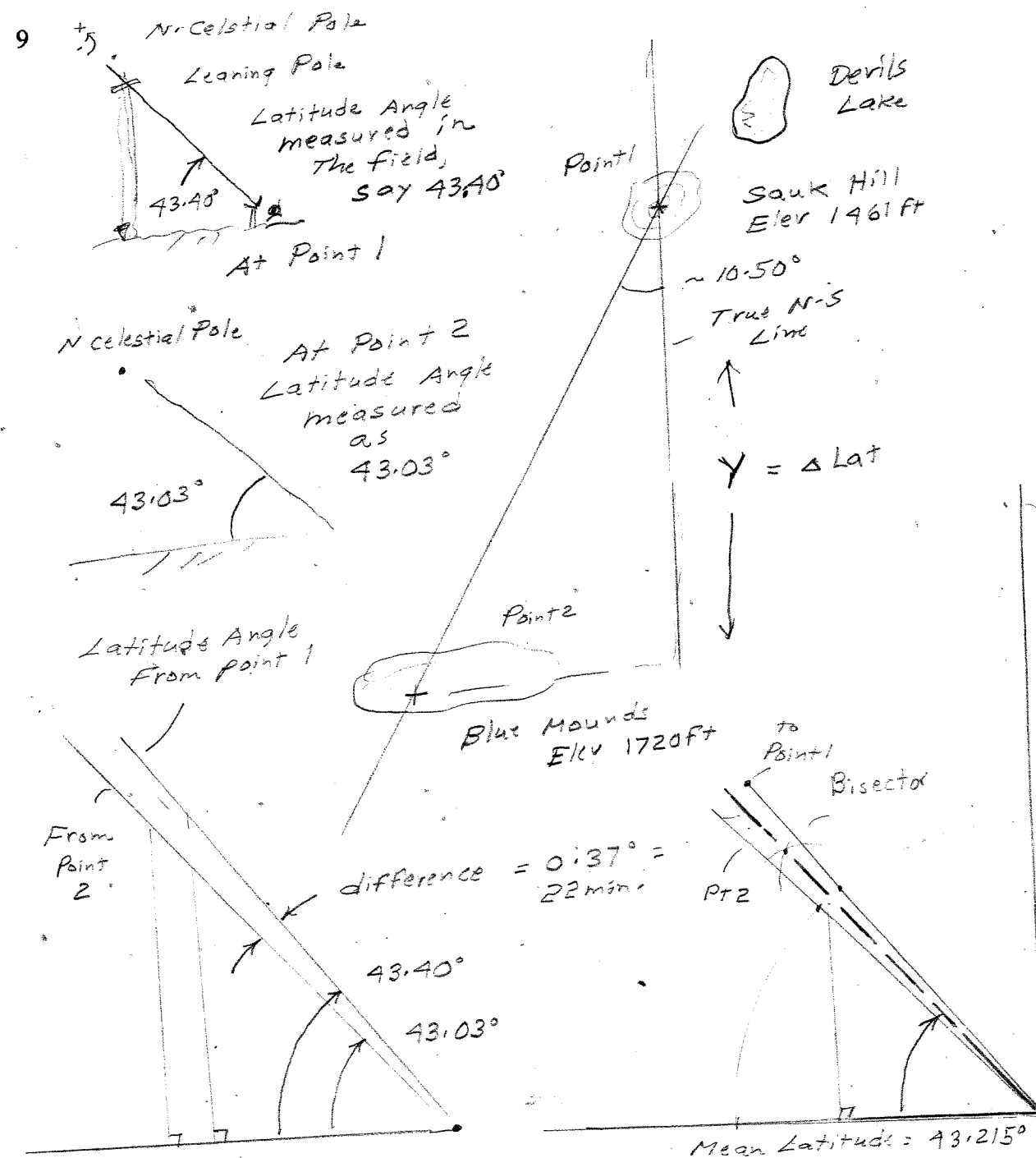


Figure 4. Hypothetical Alignments between Sauk Hill near Devils Lake and Blue Mounds

By extending the lines for the latitude angles to a large circle, the angle for the difference in latitude could be compared to a precise reference angle of 1.00 deg., which in turn is sub-divided (as shown in Figure 4) into 60 parts or 60 minutes of arc. In our sketch, this difference is shown as about 22 minutes of arc (although the errors of rope geometry might contaminate the last digit). This means that the north-south distance between the two signal hills is about 22 nautical miles. Note that the above calculations can all be done with just rope geometry.

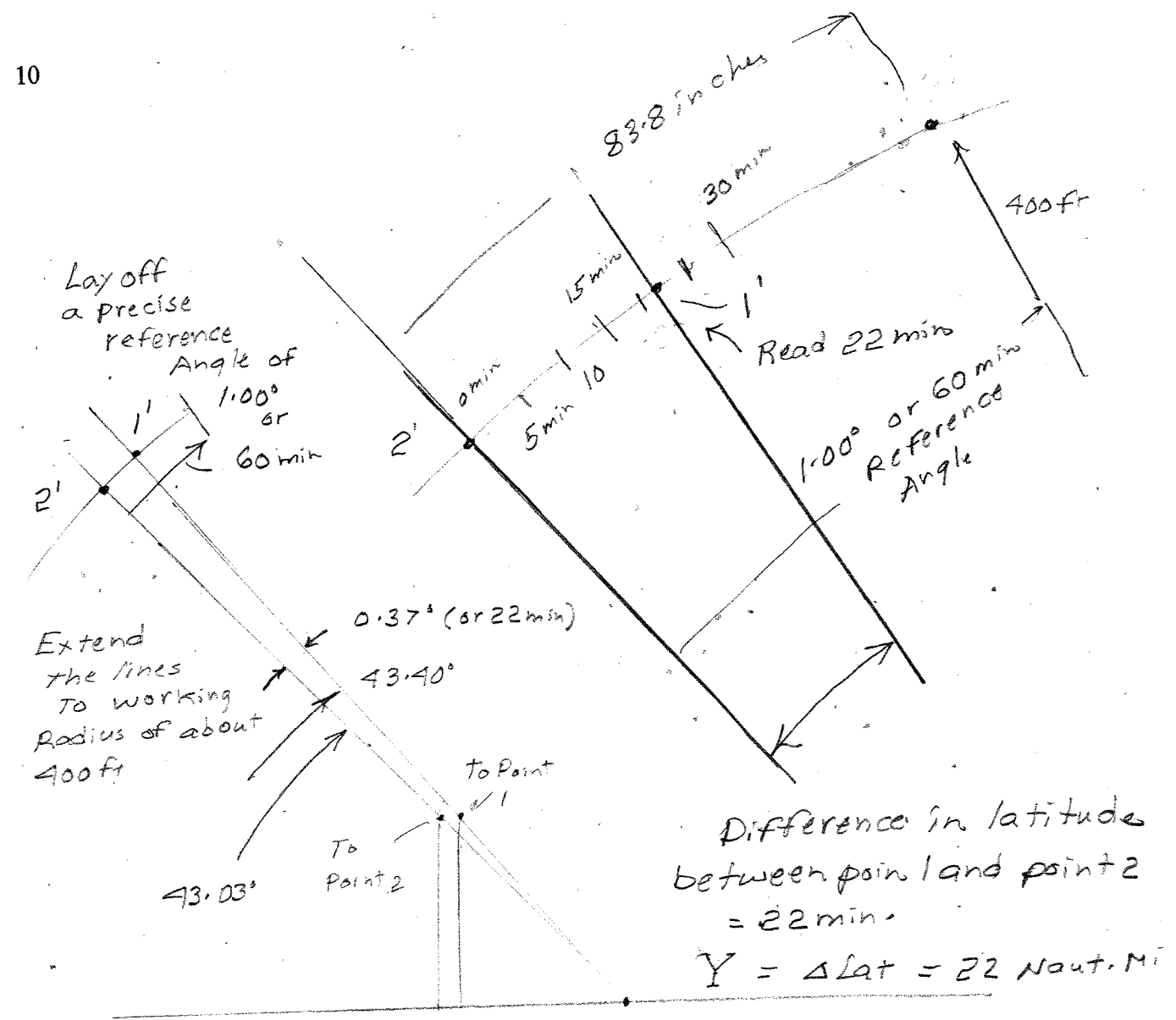


Figure 5. Analysis of geometry between Signal Hills at Sauk Hill and Blue Mounds

As measured at Sauk Hill, the true bearing angle to Blue Mounds is about 10.50 deg. We now turn to the geometry of Equation 1.

$$\tan 10.50 \text{ deg.} = \text{difference in longitude} \times \cos \text{Mean Latitude} / \text{difference in latitude.}$$

The Cos of Mean Latitude is $(43.40 + 43.03) / 2 = 43.215$, say 43.22 deg. This angle can also be easily defined by rope geometry, as shown. It creates our calculating triangle for solving Equation 1 completely by geometry. The difference in latitude is 22 minutes (or 22 nautical miles). So:

$$\tan 10.50 \text{ deg.} = \text{difference in longitude} \times \cos \text{Mean Latitude} / \text{difference in latitude.}$$

$$\tan 10.50 \text{ deg.} = \frac{(\text{difference in longitude} \times \cos 43.22 \text{ deg.})}{22 \text{ min. of latitude}}$$

$$\text{Difference in longitude} = \frac{\tan 10.50 \text{ deg.} \times 22 \text{ min. of latitude}}{\cos 43.22 \text{ deg.}}$$

Using a pocket calculator, we get: Difference in longitude = 5.6 minutes of longitude.

What seems confusing to us as manipulation of equations, trig functions, and different units of distance, becomes much simpler and clearer when we force ourselves to think in the manner when ancients solved such matters completely with triangles, graduated circles, and graduates scales (the ancient graphical method of calculation). Solution of the above equation completely by rope geometry is shown in Appendix 2, at the end of this document.

The important point here is to show that with only rope geometry and observations of the type that ancient New World surveyors could have used, we can get the difference in longitude between Sauk Hill near Devils Lake and a signal station at Blue Mounds. The difference in longitude is 5.6 minutes of longitude. If we establish a local prime meridian through Sauk Hill, then the longitude of Blue Mounds would be 5.6 minutes West.

From the signal station at Blue Mounds, there will be other inter-visible hills westward. The same general process can be carried on between such other signal hills. Values of Latitude and Longitude could be similarly calculated for all such signal hills. See Figure 6. By use of Equation 1, we could determine the True Bearing Angle between any two distant stations, even though they would not be inter-visible (such as between Bighorn Mountain near the Bighorn Medicine Wheel and Eagle Rock). The same system could have been used along the ancient Silk Roads of Asia to produce the values of both Latitude and Longitude for these cities which Al-Biruni found in about AD 1000, which were a great puzzle to him (and which led to his efforts to create spherical trigonometry and what we call geodesy to check the values).

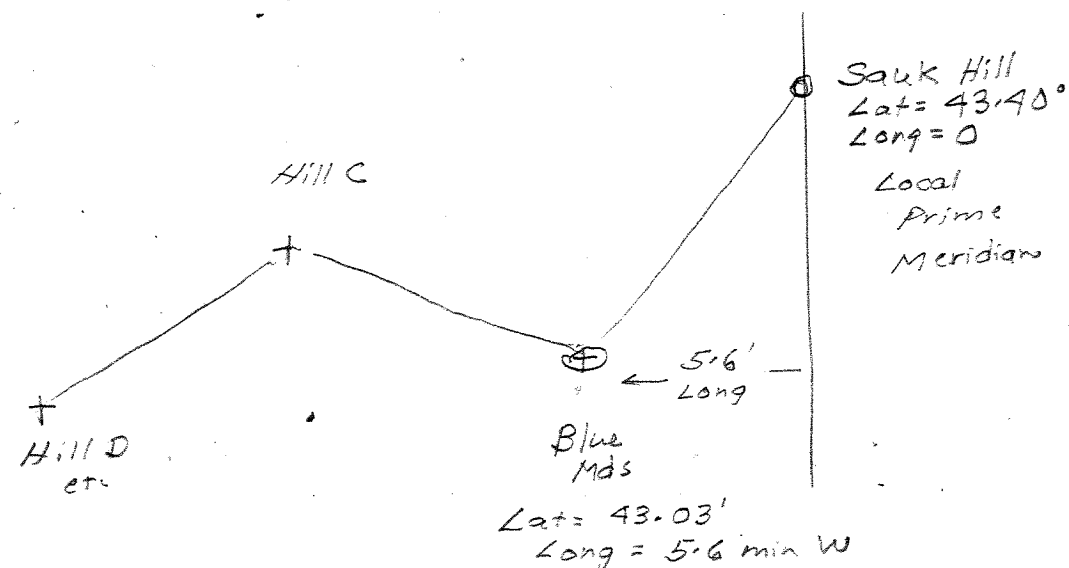


Figure 6. A Network of Distant Signal Hills

Figure 6 shows that this method can be extended from signal hill to signal hill, even across the Mississippi and to wherever such signal hills were once manned. Martin Carrier in his book ~~xxx~~ writes that from Native traditions still preserved in Canada, the entire continent had been mapped from coast to coast by the natives long before the coming of the French or even Columbus.

As it is possible by using Equation 1 to determine the true bearing angle between distant signal hills on land for which we know the Latitude and Longitude, so also it is possible to sail across the open sea between ports for which we know the Latitude and Longitude. We will illustrate how Equation 1 could have been used by ancient sailors (using what the navigation texts refer to as the old Middle ^{Distance} ~~Distance~~ Method of Sailing).

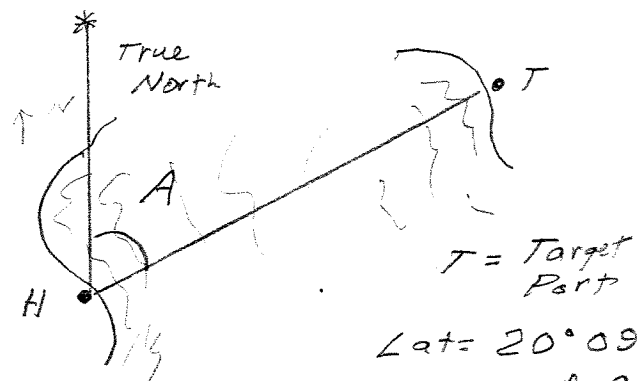
Calculating the True Bearing Angle between Two Ports in Ancient Asia:

Figure 7 shows data for two ports in Asia, where we want to calculate the true bearing angle to use when sailing between them. Very ancient navigators used the stars for direction (as the case with the Phoenicians, etc.) before the use of the less accurate magnetic compass. As shown, the home port (H) has a latitude and longitude of 13 deg. 04 min N, and 4 deg. 29 min. E, respectively. The target port (T) has latitude and longitude of 20 deg., 09 min. N and 17 deg., 08 min E.

From a reference line on a piece of parchment (the x axis) the navigator uses an ancient graduated circle (similar to our protractors) to lay out the latitude angles for the two ports. With a dividers or drafting compass and straight edge, he bisects this angle to create the mean latitude of the site (16.6 deg.). With this mean latitude, he constructs the "calculating triangle", as shown. Using a graduated scale (similar to our modern engineers scales) he lays out the difference in longitude (759 minutes of longitude) along the hypotenuse of the calculating triangle, and projects the end down to the x axis. The resulting value along the x axis is (difference in longitude x Cosine of the mean latitude) or the upper part of Equation 1. This is also the difference in longitude (at the mean latitude) converted to nautical miles (or 727 nautical miles).

As shown in Figure 7a, the tangent of the bearing angle (easily determined by geometrical means) is 727 / 425 or the difference in longitude x Cosine of Mean Latitude / Difference in Latitude (as in Equation 1). And the bearing angle is 59.7 deg. from my pocket calculator. It can also be measured off the graduated ~~scale~~ ^{circle} or protractor.

The same procedure will also work over land between two sites, such as the Bighorn Mountain near the Medicine Wheel in Montana and Eagle Rock in upper Michigan.



Lat = $20^{\circ}09'N$
Long = $17^{\circ}08'E$

Home Port = H.
Lat = $13^{\circ}04'N$
Long = $4^{\circ}29'E$

Objective: Determine True Bearing A by use of Equation 1 (or the old method of "Middle Latitude Sailing")

$\Delta Lat = 20^{\circ}09' - 13^{\circ}04' = 7^{\circ}05'$
this is also $7 \times 60 + 5 = 425$ min of latitude or 425 nautical miles.

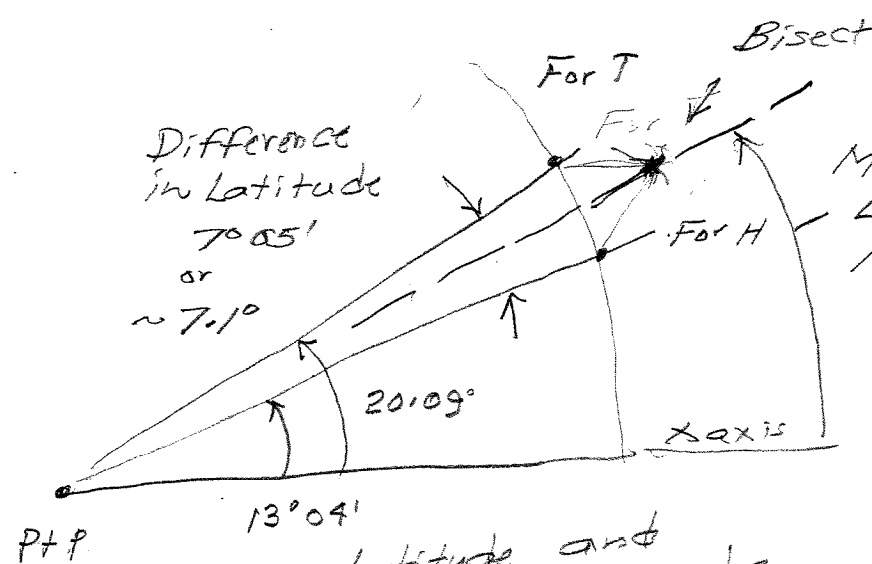
$\Delta Long = 17^{\circ}08' - 4^{\circ}29' = 12^{\circ}39'$
this is also $12 \times 60 + 39 = 720 + 39 = 759$ min of longitude.

The mean Latitude is $(13^{\circ}04' + 20^{\circ}09')/2 = 16.61^{\circ}$. If our ancient navigator had access to trig tables, he could solve for the Bearing Angle A by Equation 1:

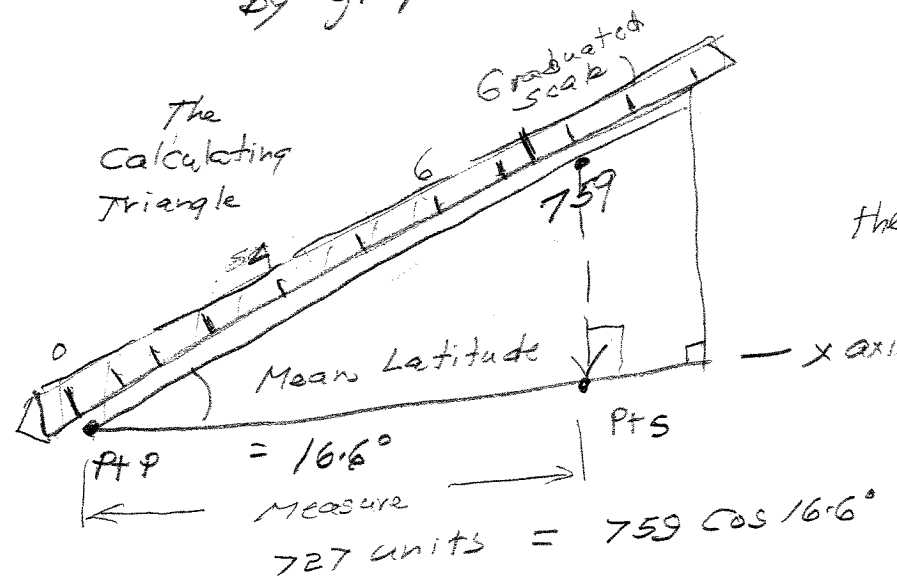
$$\begin{aligned} \tan A &= (\Delta Long \times \cos \text{Mean Lat}) / \Delta Lat \\ &= (759 \text{ min. of long}) \times \cos 16.61^{\circ} / 425 \text{ min. of Lat} \\ &= 727 \text{ nautical miles} / 425 \text{ naut. mi} \end{aligned}$$

$$A = 59.7^{\circ}$$

If our ancient navigator only had access to the old graphical methods, he would proceed as follows:
First he would lay off the latitude angles of ports H and T from a reference line (call it the "x axis") as shown. Then he would bisect the angles to define the angle of the Mean Latitude. (It will be used for his "calculating triangle".)



Mean latitude and difference in latitude by graphical methods.



Here we assume that he has a drafting compass or dividers as used thousands of years ago, and an accurate graduated circle (divided into degrees like modern protractors) of the type we know Al-Biruni used in AD 1000, and ancient graduated scales not unlike modern engineers scales.

The difference in longitude is 759 minutes of longitude. Choose a convenient scale to lay off about 759 units on the hypotenuse of our calculating triangle as shown. Project down to **Pt S** on the x axis and measure about 727 units with the graduated scale. This is $759 \times \cos 16.6^{\circ} = 759 \text{ min. of long} \times \cos \text{Mean Lat}$ or the upper part of Equation 1.

It is a simple matter to create the Bearing Angle A by geometry as shown in Figure 7a.

Figure 7. To sail across the open Sea using Equation 1.

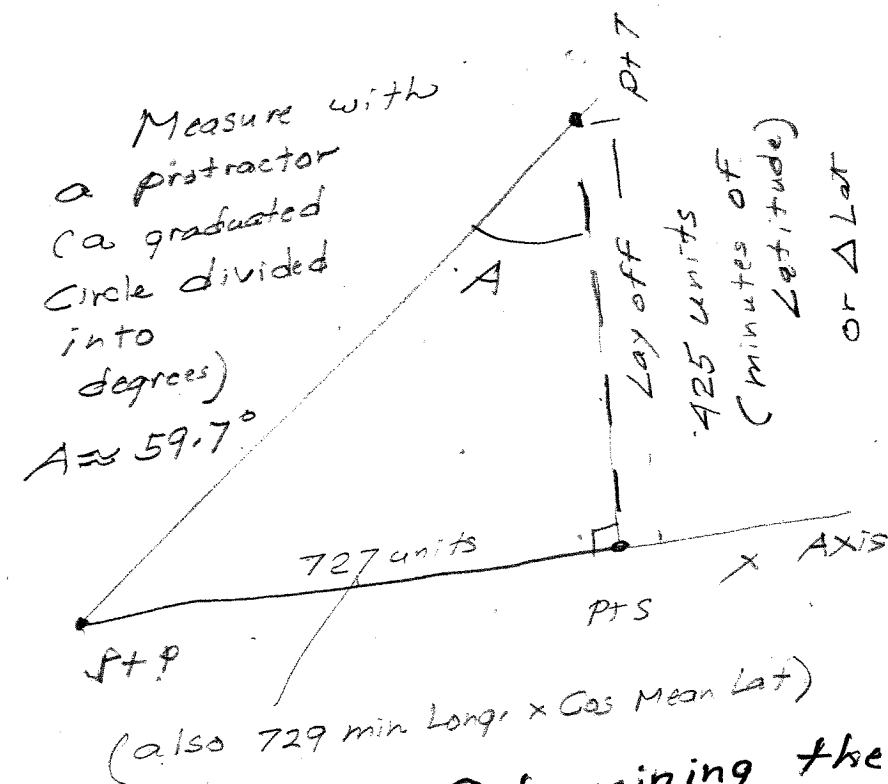


Figure 7a. Determining the Bearing Angle A by graphical means.

In Figure 7a, extend the perpendicular from the X axis at P+S. Using our same graduated scale, lay off 425 units which correspond to the difference in Latitude (in nautical miles). With a graduated circle (like our modern protractor, read the angle A.

$$\tan A = \frac{727}{425} = \frac{\Delta Long \times \cos \text{Mean Lat}}{\Delta Lat}$$

It should be about 59.7°

References:

Carriere, Martin; 2010; "Carrying the Chalice Forward, and other Secret Stories of North America"; St. Clair Publications, Mc Minnville, TN

Peirce, Benjamin (Professor of Mathematics at Harvard University) 1865; "Plane and Spherical Trigonometry and their applications to Navigation, Surveying, Heights and Distance and Spherical Astronomy--explaining Construction of Bowditch's Navigator, and the Nautical Almanac"; Boston

Scherz, James P.; 2009; "Survey Report for Eagle Rock"

NOTES:

Appendix 1

Some Pages from Preliminary Survey Report from the Hensler Site

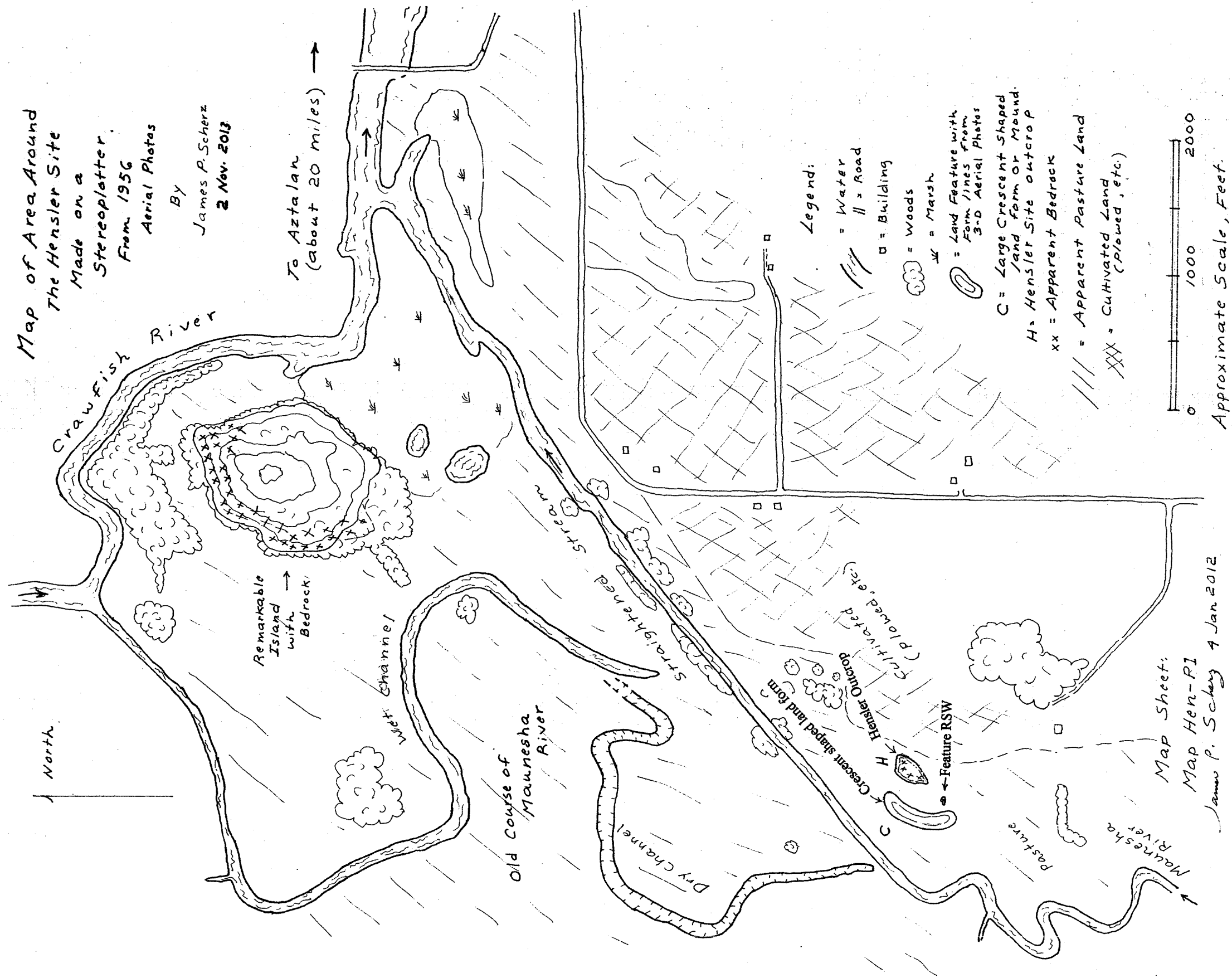
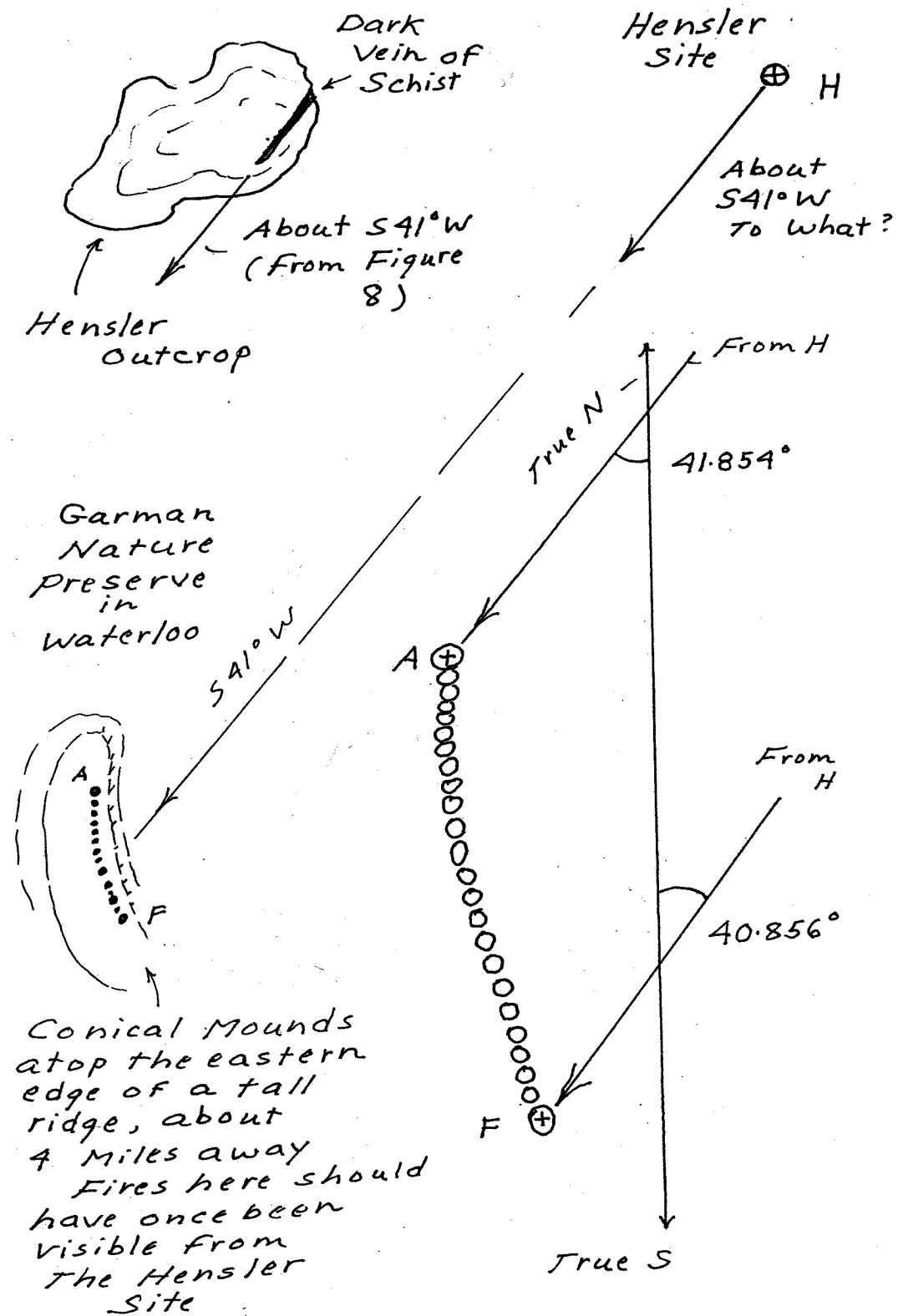


Figure 5. Map compiled from 1956 Aerial Photos showing selected features



Maps Compiled from the Field Data :

Figures 10 to Figure 10-C show reduced copies of the map compiled from the field data taken on the afternoons of 30 Sept. and 16 Dec., 2012 (at a scale of 1 inch = 20 ft.). This scale was used because I had standardized this scale for my field sketches. But for this site, this scale map is a bit too small to show all of the details clearly. Consequently, I manipulated by field sketches to a scale of 1 in = 10 ft. and compiled a larger scale map. This is shown in Figures 11 to 11-D. As I suspected when surveying the site, the form of the quartzite outcrop can be likened to a giant effigy of an animal headed to the southwest (the same direction as the large majority of the effigy mounds of southern Wisconsin). A large pothole about 2 feet deep into the bedrock on the far southwestern end of the outcrop corresponds to an eye in the effigy. And the vein of dark schist on the northeastern end corresponds to the birth channel of the effigy animal. The symbol seems to be one of fertility of nature, used around the world in ancient times.

It also appears that the ancient way of approaching the site was from the northeast to the dark vein of schist and then upward about 15 ft. to the top of the outcrop. (This is the same route used by researchers, yet today.) Consequently, to better show this possibility, the map in Figures 11 to Figure 11-D are rotated 180 deg. from that shown in Figure 10 to 10-C, so one can better see the direction of probable approach and the possibility of the effigy form that can be perceived in the outcrop. In Figures 11 to Figure 11-D, true north is to the bottom of the map.

Some Features of Interest on the Maps:

At other ancient ceremonial sites further north in Wisconsin and Upper Michigan, the key geometry and apparent calendar function is indicated not with effigy mounds, but by rock cairns, out-of-place rocks resting on top of the soil, or by prominent rocks of special shapes.

The Crooked Mountain Shape:



Rocks of this shape consist of a rock slab lying flat, with one rather straight edge, a hump on the opposite edge, and a clear nose-like protrusion. In the geometry at one large site (still revered by Native Americans) it is clear that the noses of such features are like survey stations which define precise points of key geometry (like modern survey markers). Rocks of this shape (and defining key geometry) can be found as far west as at the Bighorn Medicine Wheel in Montana. (See Scherz, April, 2009, pp 105, A-3, A-4, A-5 and AT-10.) If these correlations are real and meaningful, then this particular symbol was once recognized over a very large area. Such shapes also show up in the Mexican Codices where they stand for a place called Crooked Mountain, far to the north. It is for this reason that I call this general shape "The Crooked Mountain Symbol" Figure 12 shows some typical Crooked Mountain shapes. Note that there is a large slab of apparent bedrock outcrop just to the southwest of the Hensler outcrop which looks like this symbol. It is shown as "Feature RSW." If the Crooked Mountain Symbol was widely recognized in the New World in ancient times, then people associated with the petroglyphs at the Hensler Site would not have overlooked this shape. If Feature RSW is a product of glacial erosion, then it would appear that the creator had designated this area as a very special place.²

² The terrain in this area was also conducive to where lightening would tend to strike. This too would have been important aspect of the site. (West of the prominent outcrop where storms approach, the terrain is low and flat.)

Survey Methods: A total Station field instrument with direction control by Sunshots so that our maps are automatically oriented to true or Celestial North. Points near points of interest were marked with playing cards. A reflector pole was held on these cards and the Total Station measured the direction and distance to the rod. A surveying tape was stretched between surveyed points to form a base line for field sketches. Distances of features of interest were measured from the base line (tape) by either an extended level rod or by estimation, depending on the accuracy needed and the available time. Coordinates relative to where the instrument was set up at were calculated and plotted (here) at a scale of 1 inch = 20 ft. Since the field sketches were at the same scale, details on the field sketches could be easily transferred to the base map on a light table.

The size and shape of the quartzite outcrop comprising the Hensler Site is approximately 210 ft. long from the NE to SW direction and about 120 ft. wide. It once rose from about 10 to 15 ft. above the surrounding terrain. About $\frac{1}{2}$ of the outcrop got covered long ago by a thin layer of wind-blown glacial dust which apparently blew in from the west like drifting snow. The excavations at this site are through this thin layer to the top of the bedrock where ancient ceremonies are indicated.



Legend:

- 838.3  = Instrument Location and associated elevation in ft.
- 819.1  = Surveyed point and elevation
- 830 — Contour Line, feet


\downarrow = decreasing elevation


 = Pit or pothole in bedrock.


○○ = Rocks ○ = Tree or stump

 = Area of Excavation  = Test Pits

Exposed Quartzite Bedrock

 = Band of Dark Schist intruded into the quartzite

 = Area where Glacier Flour (Loess) had drifted over like blowing snow


 R7, R1, R2, R3, R4, R5 and R6 are seemingly out-of-place rocks, which may define geometry or Calendar function. They need more study.

COOP = Modern Rubble


/// = Modern Berm built by Quarry Owners to protect the Site


♂_{TI} = Deformed Tree and approximate direction of deformed Limb, before it blew down.

R2

12" 

View from SE

R8D 

Perched Rock R3 

(Approximate)

These Features

Perched Rock
R3
(Approximate)

These Features
can alert a person
near the
petroglyphs.

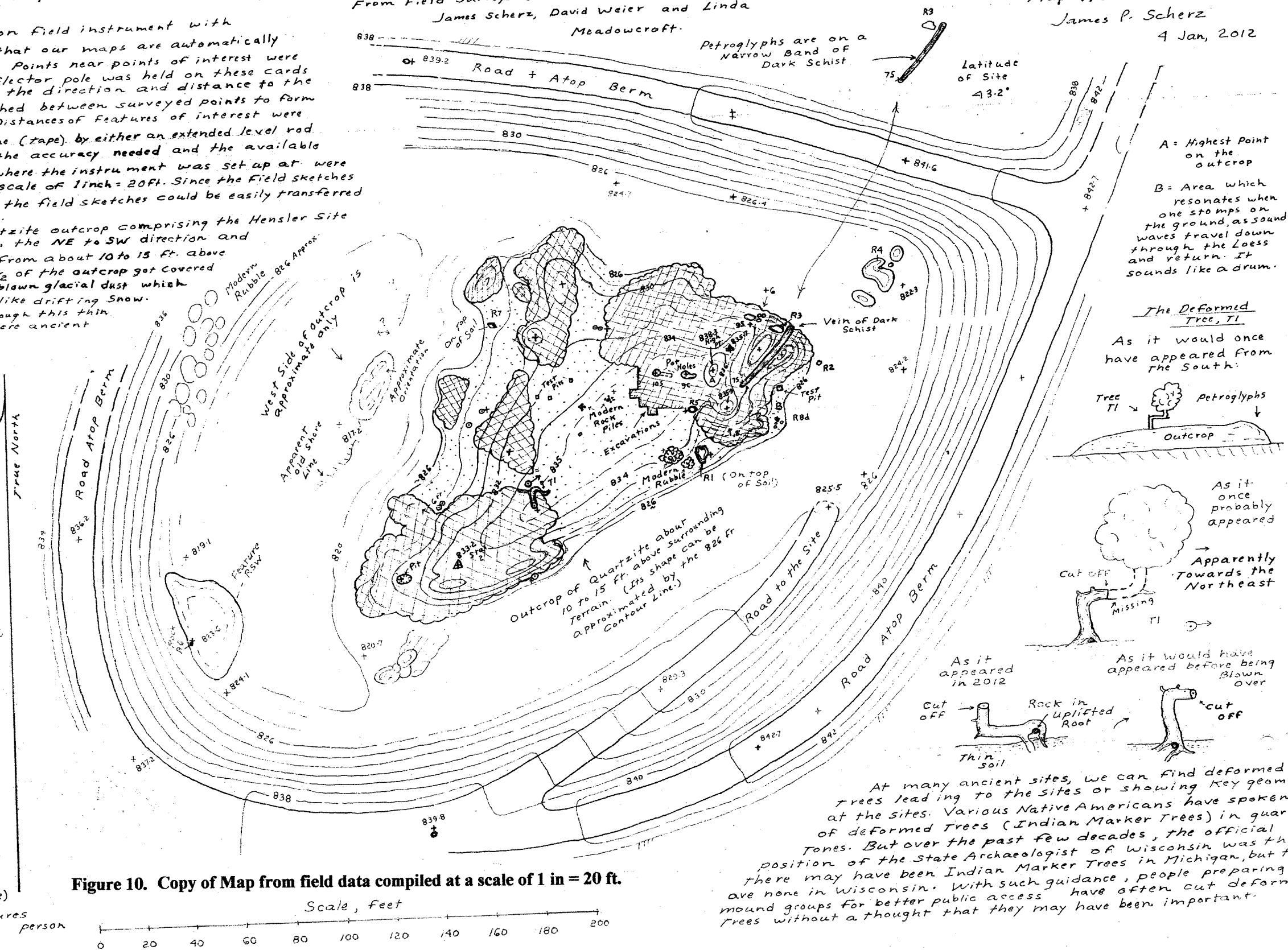


Figure 10. Copy of Map from field data compiled at a scale of 1 in = 20 ft.

At many ancient sites, we can find deformed trees leading to the sites or showing key geometry at the sites. Various Native Americans have spoken of deformed trees (Indian Marker Trees) in guarded tones. But over the past few decades, the official position of the State Archaeologist of Wisconsin was that there may have been Indian Marker Trees in Michigan, but there are none in Wisconsin. With such guidance, people preparing mound groups for better public access have often cut deformed trees without a thought that they may have been important.

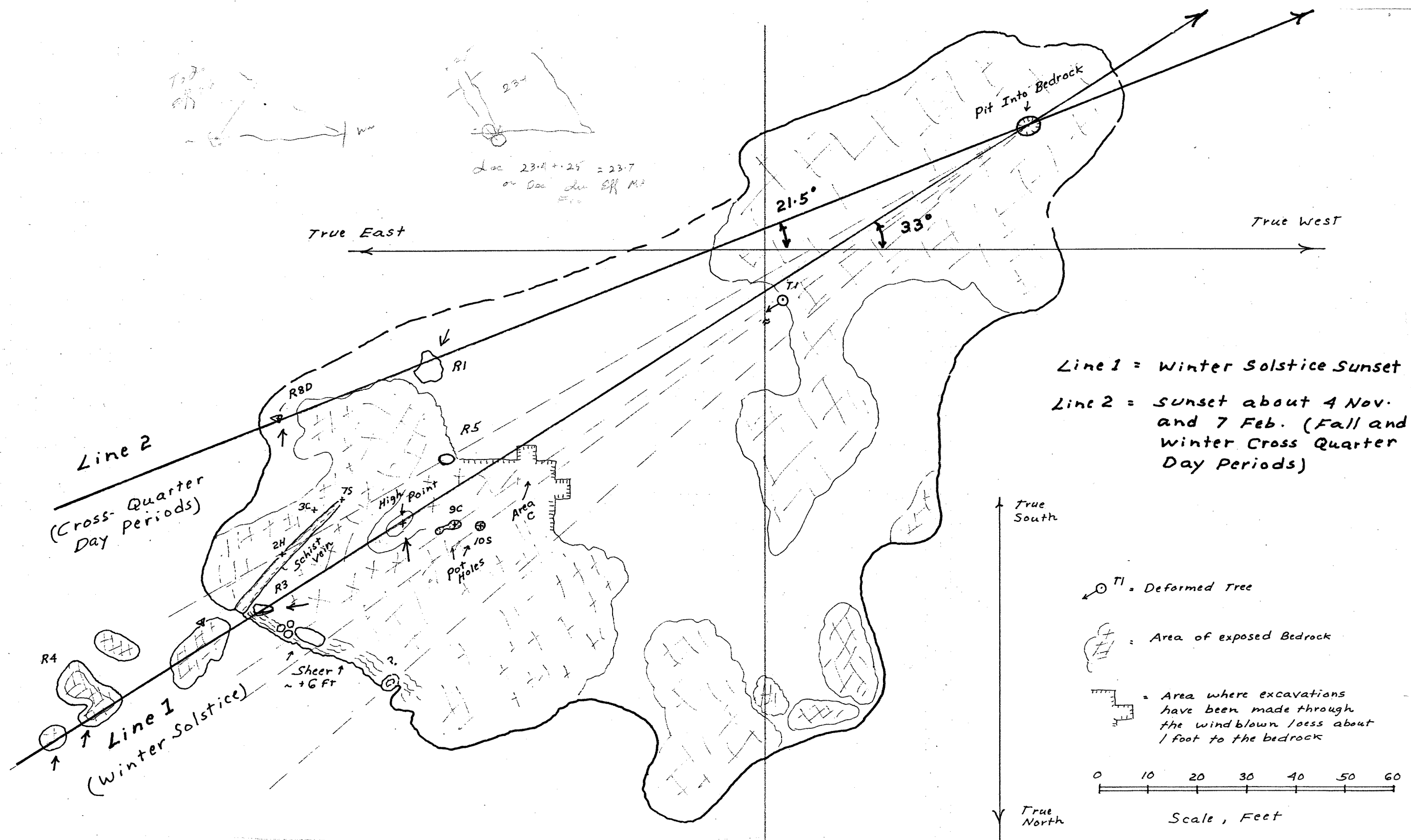


Figure 25. A Solar Calendar (winter solstice and cross quarter days) at the Hensler Site
(Note that the two rocks resembling the heads of bears, R1 and R3, are involved)

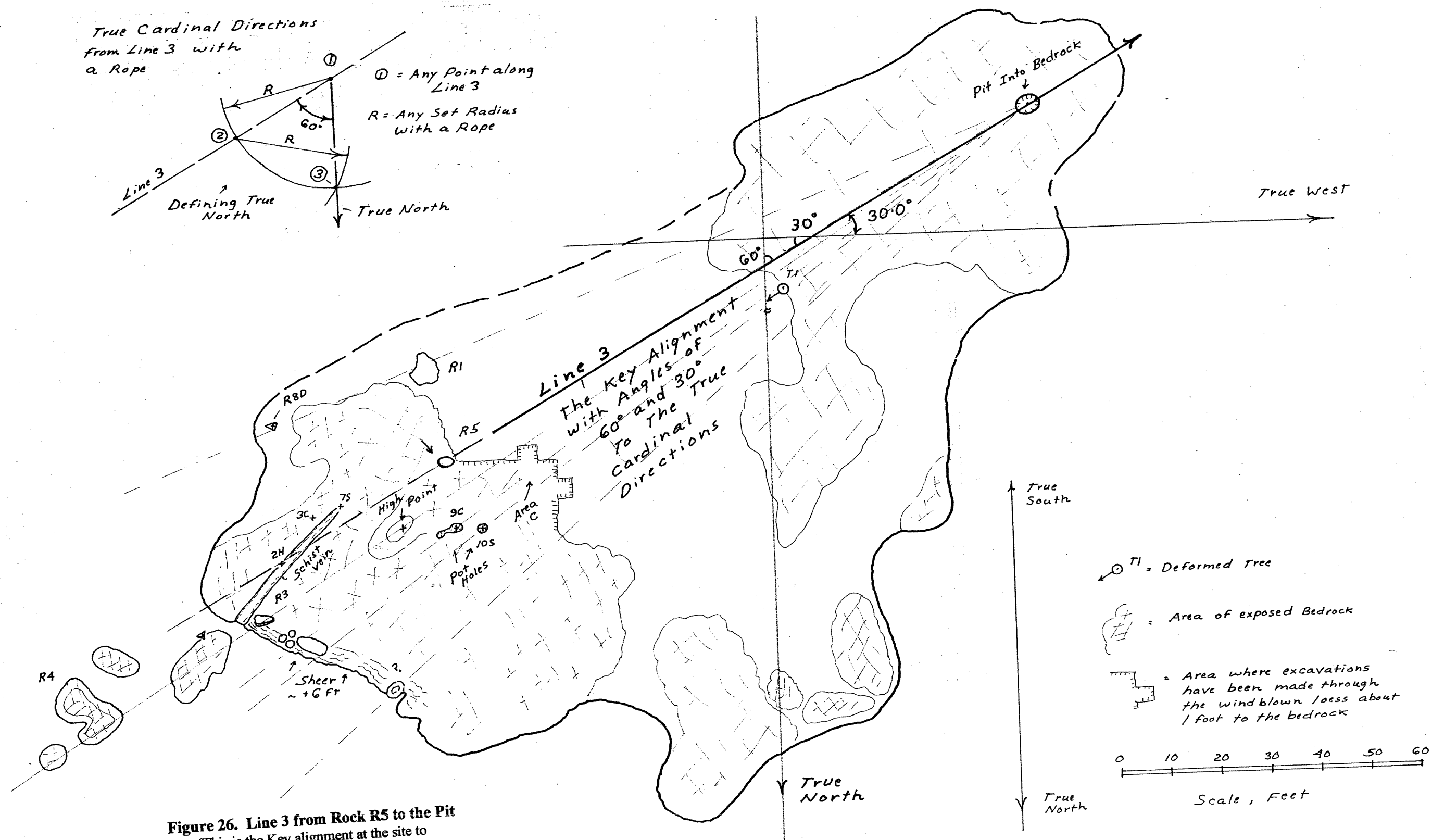


Figure 26. Line 3 from Rock R5 to the Pit
 (This is the Key alignment at the site to establish the true cardinal directions.)

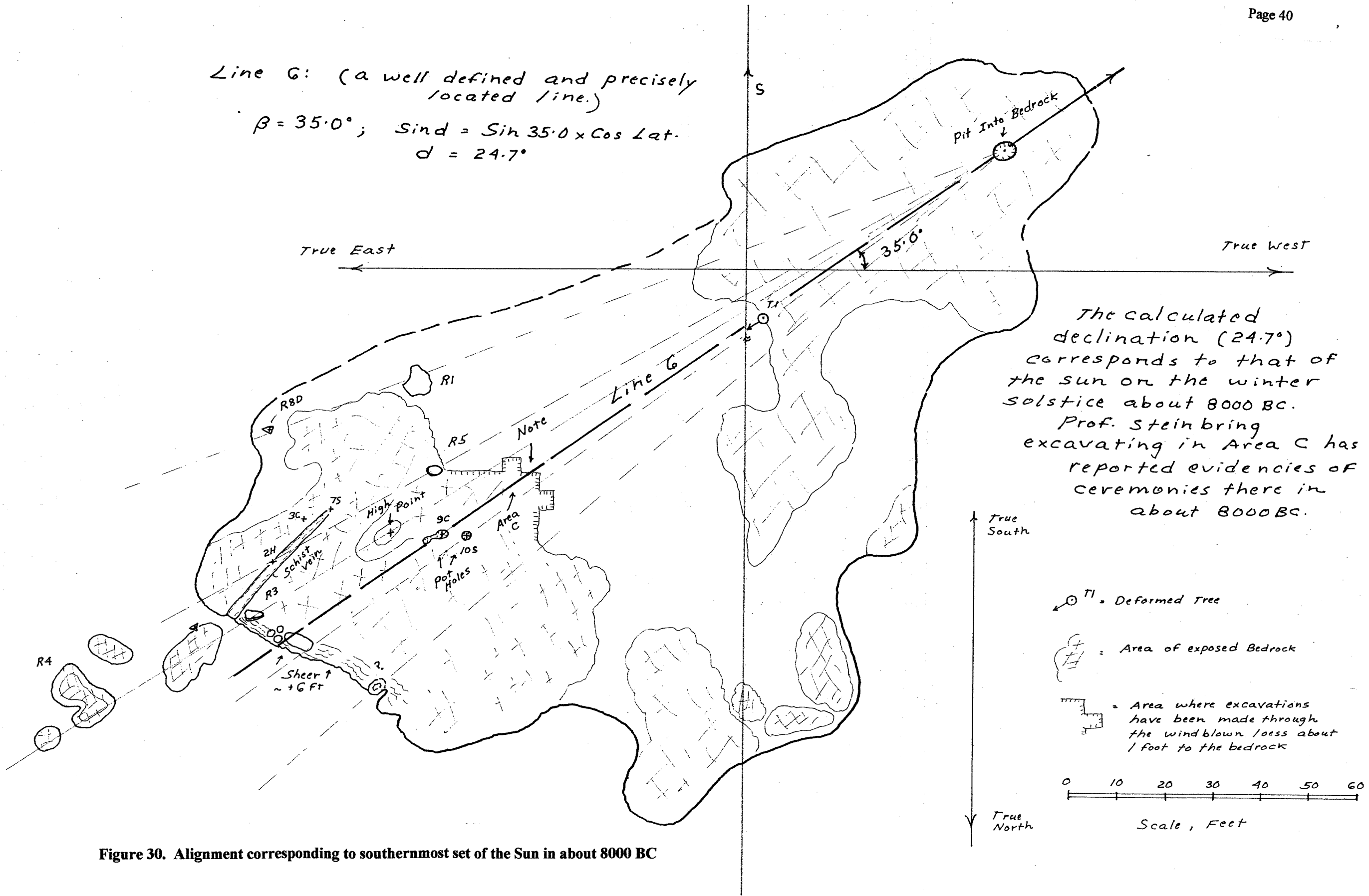


Figure 30. Alignment corresponding to southernmost set of the Sun in about 8000 BC

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 RS to the Pit. As shown to the right, it is oriented to 60° from true North.

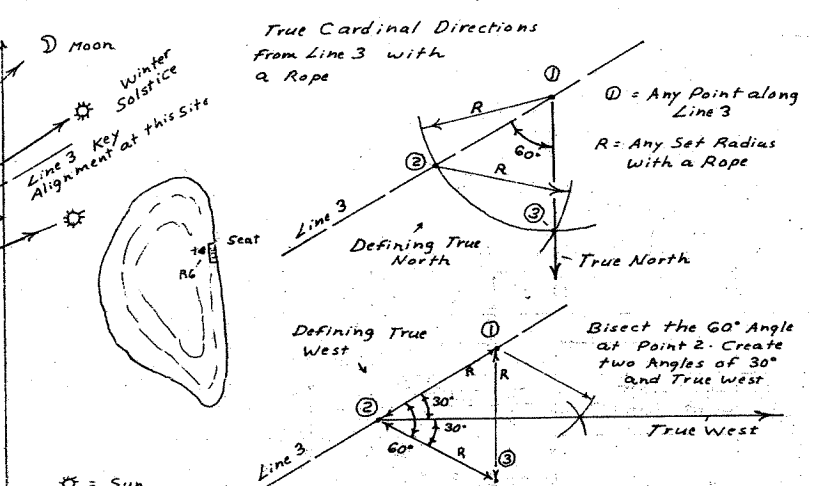
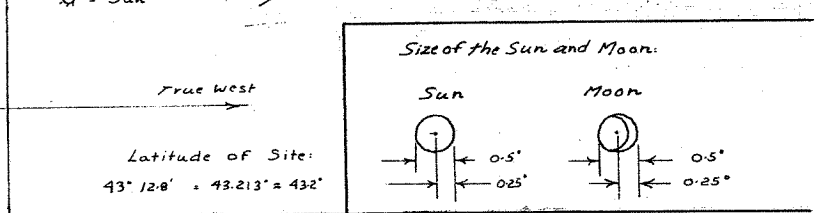
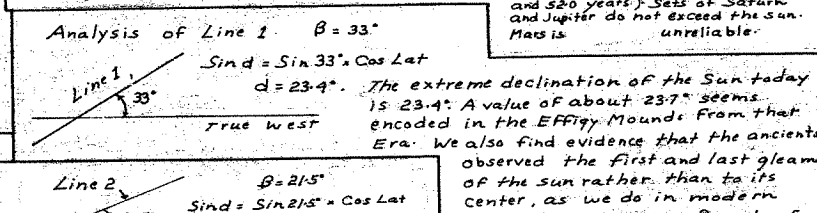
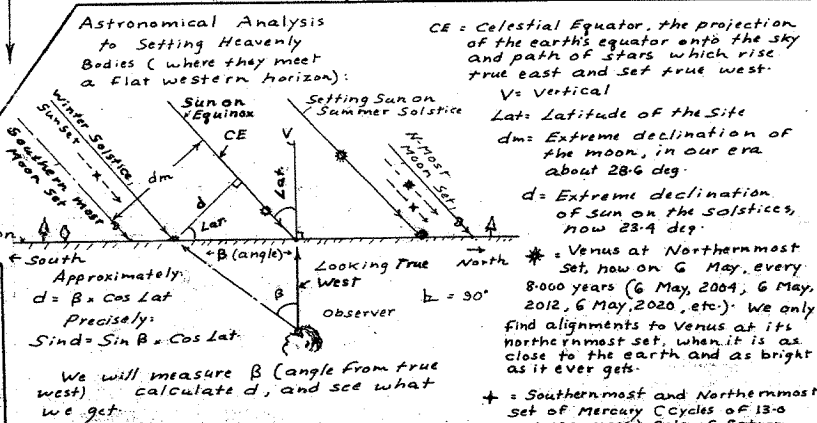
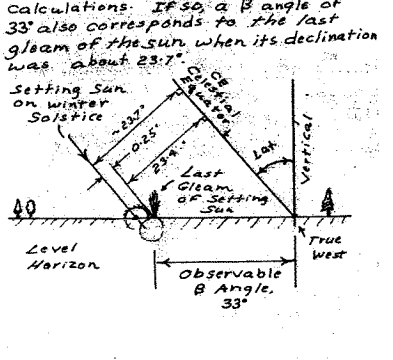
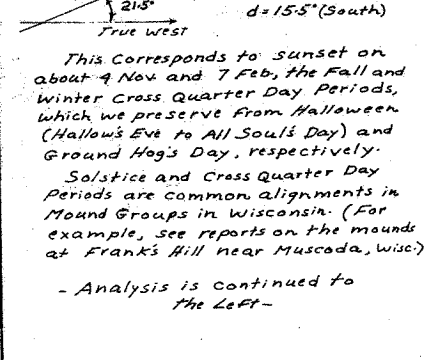
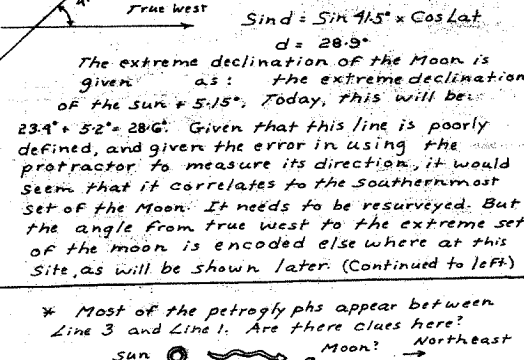
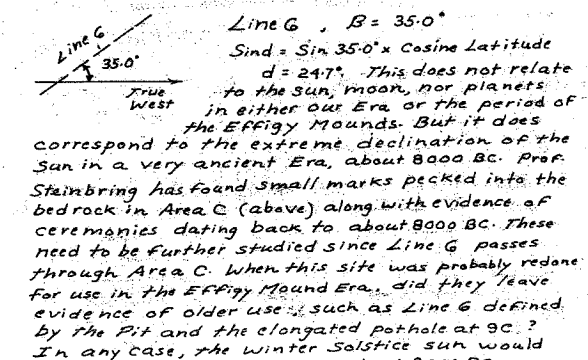
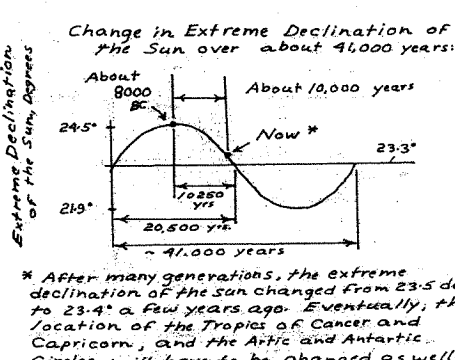
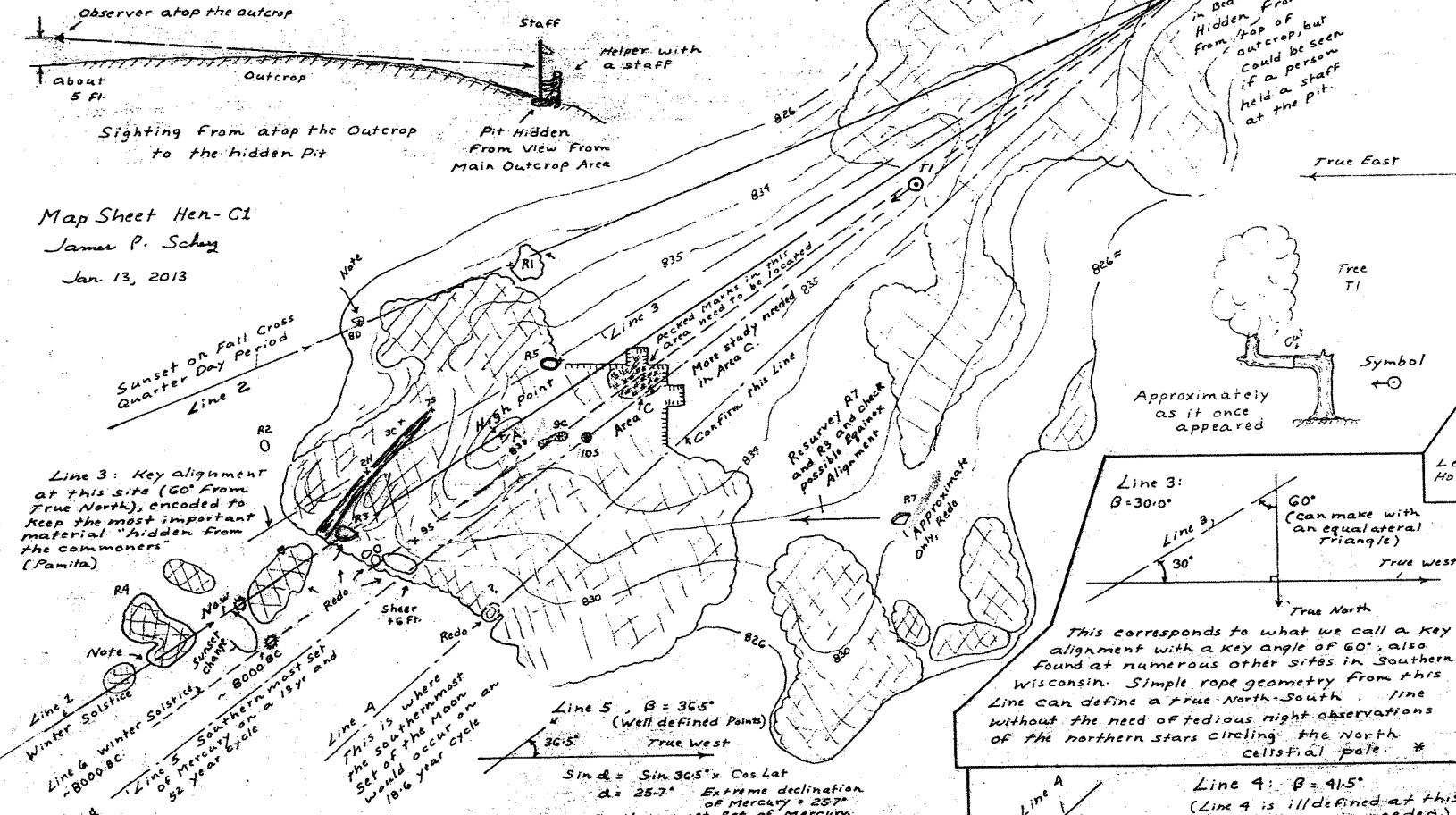


Figure 31. Reduced copy of map used in the geometrical and calendar analysis

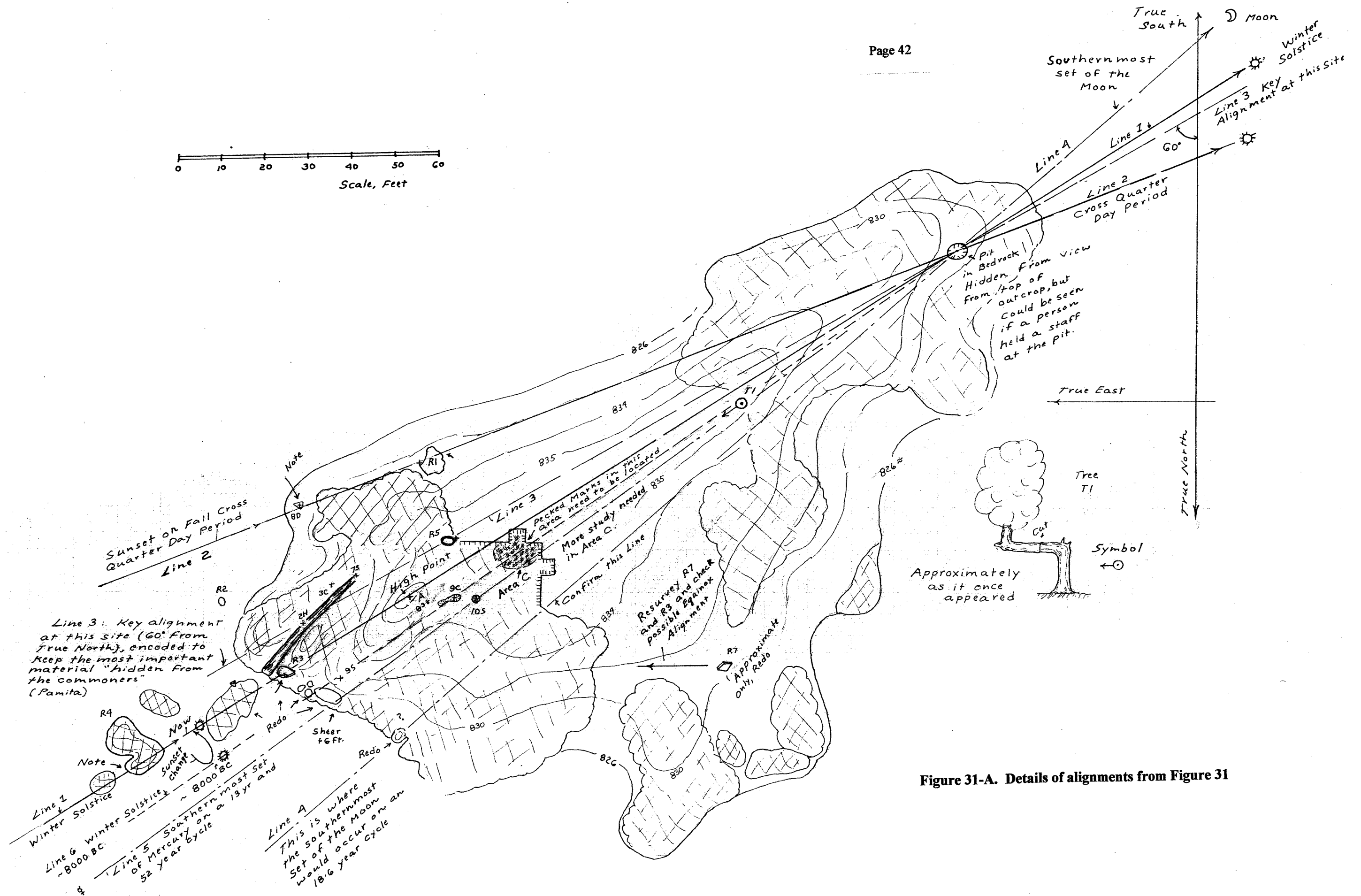


Figure 31-A. Details of alignments from Figure 31

Appendix 2

Solving for the Difference in Longitude between Sauk Hill and Blue Mounds by Graphical Means

(From Figures 4 and 5)

Using hypothetical angles determined from the field at Sauk Hill and Blue Mounds, we used Equation 1 to solve for the difference in longitude between these signal hills by use of a pocket calculator. Equation 1:

$$\text{Tan of Bearing Angle} = \frac{\text{difference in longitude} \times \text{Cos Mean Latitude}}{\text{difference in latitude.}}$$

$$\text{Tan } 10.50 \text{ deg.} = \frac{\text{difference in longitude} \times \text{Cos Mean Latitude}}{\text{difference in latitude.}}$$

$$\text{Tan } 10.50 \text{ deg.} = \frac{(\text{difference in longitude}) \times \text{Cos } 43.22 \text{ deg.}}{22 \text{ min. of latitude}}$$

$$\text{Difference in longitude} = \frac{\text{Tan } 10.50 \text{ deg.} \times 22 \text{ min. of latitude}}{\text{Cos } 43.22 \text{ deg.}}$$

Using a pocket calculator, we get: Difference in longitude = 5.6 minutes of longitude.

We will here repeat the calculations, but only use graphical methods. The difference in latitude was determined by comparing latitude angles observed at the two sites against a precise reference angle of 1.00 deg. carefully divided into smaller values of minutes. We also constructed an angle equal to the mean latitude between Sauk Hill and Blue Mounds. This angle was about 43.215 deg. (say 43.22 deg.). This angle in a large right triangle will be our prime calculation triangle. See Figure A-1. The bearing angle observed at the signal station at Sauk Hill to Blue Mounds was 10.50 deg. west of true south. This angle of 10.50 deg. will be the prime angle in our second calculating triangle.

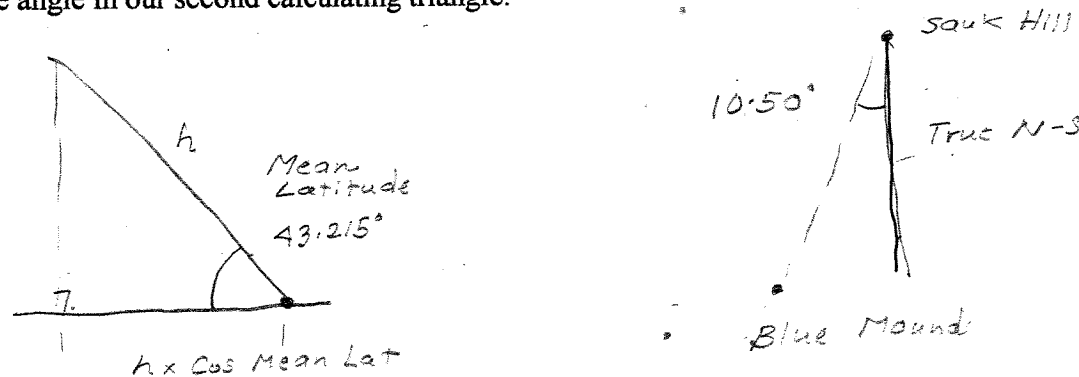


Figure A-1. Our Prime Calculating Triangle

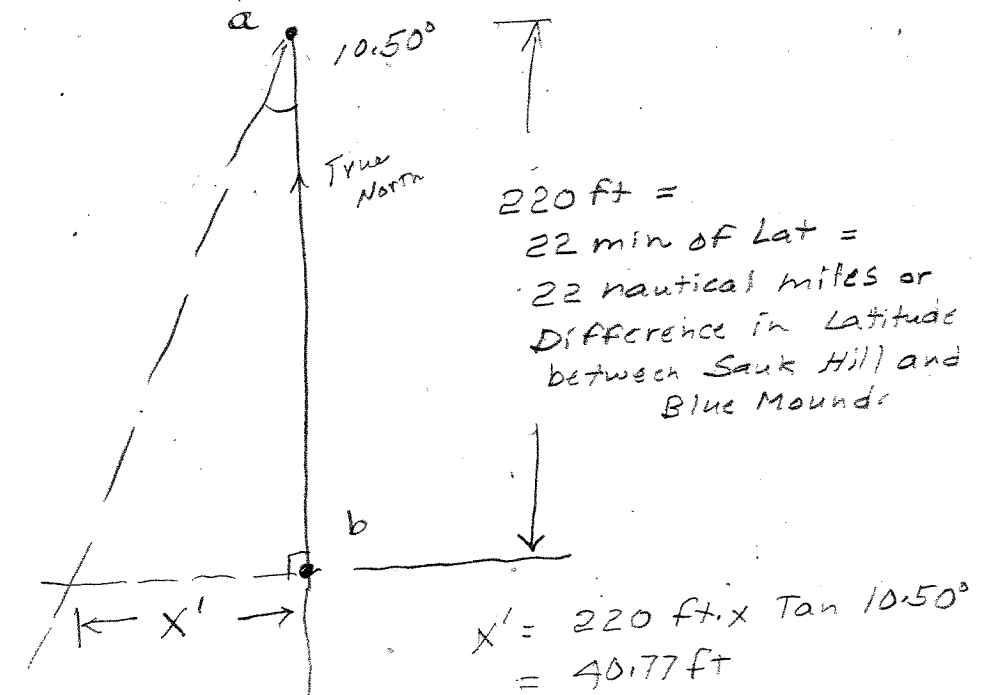


Figure A-2. Our Second Calculating Triangle

We construct our Second Calculating Triangle on flat ground using ropes. The triangle can be as large as necessary, for accurate use. Assume that the north-south side is about 300 ft. long. The ancient surveyors would not have had our modern precisely divided survey tapes. But it is known that ancient surveyors, such as the Druid surveyors, used basswood ropes with knots to measure distance. We can assume that New World surveyors also had similarly calibrated ropes to measure distance. We will proceed assuming standard survey tapes divided into statute feet. On our Second Calculating Triangle, we will lay off a distance corresponding to the measured difference in latitude between the two stations. It was 22 minutes of latitude, which corresponds to 22 nautical miles. Let us choose a layout scale of 1 minute of latitude = 10 ft.

As shown, we lay off 220 ft along the north-south side of our triangle. (From point "a" to point "b"). At point b, we construct a right angle and extend the line until it intersects the hypotenuse of the triangle. We create the distance shown as X'. $X' = \text{Tan } 10.50 \text{ deg.} \times 220 \text{ ft.}$ or about 40.77. In the field, we simply measure the distance at about 40.77 ft.

$$\text{Equation 1 states that: Tan of Bearing Angle} = \frac{\text{difference in longitude} \times \text{Cos Mean Latitude}}{\text{difference in latitude.}}$$

$$\text{or Tan } 10.50 \text{ deg.} = \frac{\text{difference in longitude} \times \text{Cos Mean Latitude}}{\text{difference in latitude.}}$$

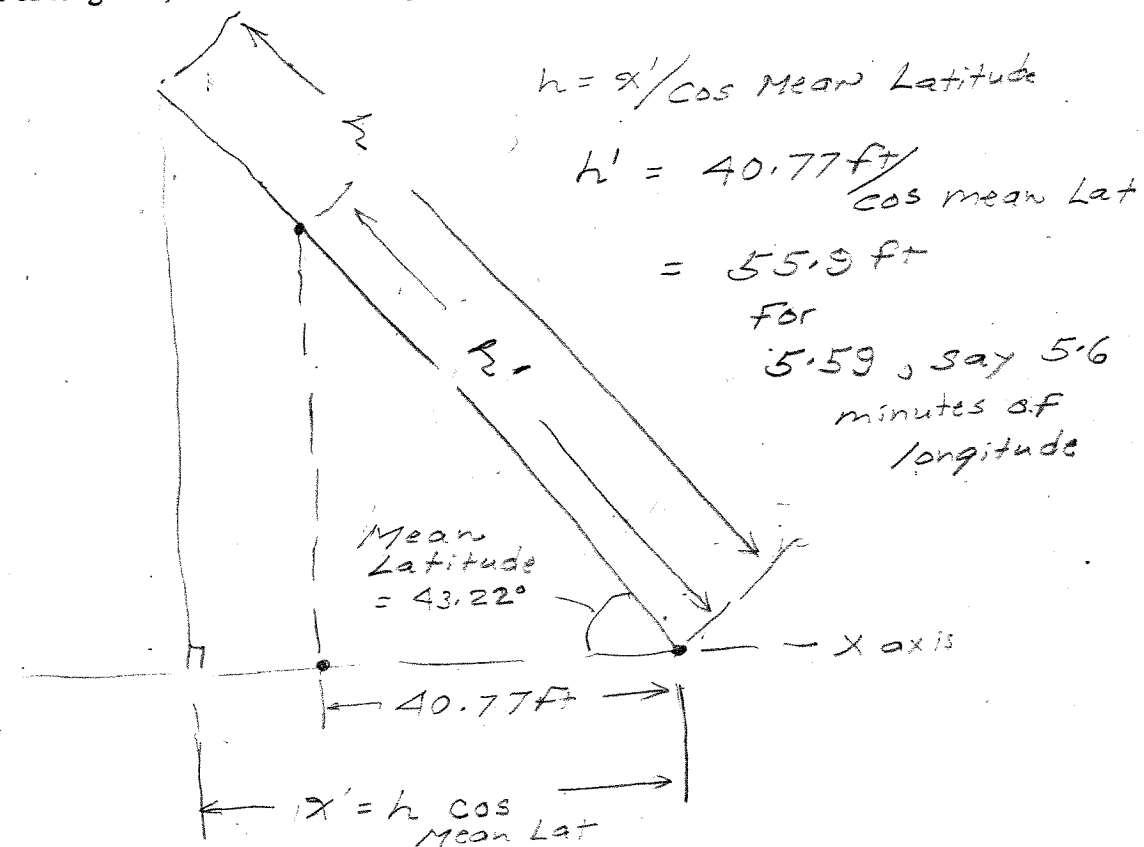
$$\text{Tan } 10.50 \text{ deg.} = \frac{(\text{difference in longitude}) \times \text{Cos } 43.22 \text{ deg.}}{22 \text{ min. of latitude}}$$

and Difference in longitude = $\frac{\tan 10.50 \text{ deg.} \times 22 \text{ min. of latitude}}{\cos 43.22 \text{ deg.}}$

Here, we have Difference in longitude = $\frac{\tan 10.50 \text{ deg.} \times 22 \text{ min. of latitude}}{\cos 43.22 \text{ deg.}}$

$$= \frac{40.77 \text{ ft.}}{\cos 43.22 \text{ deg.}} = \frac{40.77 \text{ ft.}}{\cos \text{ Mean Latitude}}, \text{ where } 1 \text{ ft.} = 10 \text{ nautical miles.}$$

We now turn to our prime calculating triangle, the right triangle with one angle equal to the Mean Latitude. See Figure A-3. As shown, the distance "h" on the hypotenuse of this triangle converts to a value on the x axis of (h x Cos of the mean Mean Latitude). Conversely, any value X on the x axis converts to a distance of (X / Cos of Mean Latitude) on the hypotenuse. When we lay out the distance of 40.77 ft. along the x axis and project to the hypotenuse, we have (40.77 ft. / Cos Mean Latitude) = 55.9 ft. This is the scalar value for our Difference in longitude. Since our scale is 1 minute = 10 ft., the difference in longitude is 55.9 / 10 = 5.59 (say 5.6) minutes of longitude, which is what we got previously.



A-3
Figure 3. The difference in longitude from our Prime Calculating Triangle

For NOTES

Appendix 3
Miscellaneous Related Figures

CATS apparently looking at The Moon and Two Planets

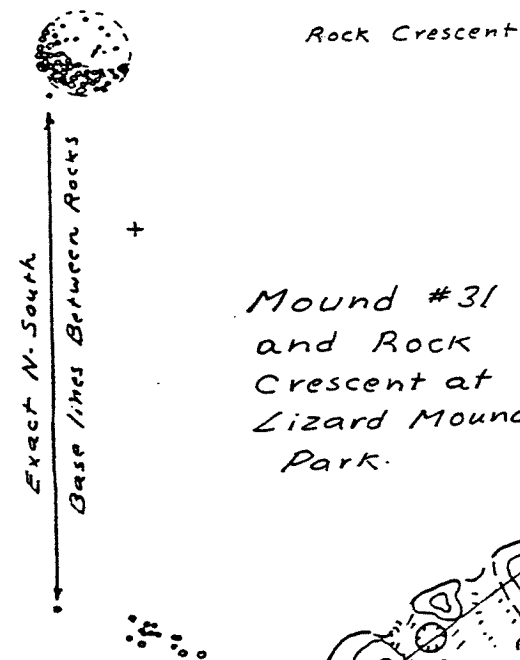
The Rock Crescent at Lizard Mound Park Compared to Ones at Madison (And a Sad Tale of Mound Destruction)

AES Journal
1990

By: J. P. Scherz

Figure 1 shows the rock crescent at Lizard Mound Park compared to a similar rock crescent at Madison, Wisconsin. These features are also shown in numerous other figures in this report.

Both of the crescents are of essentially the same size and shape as if they were both constructed from the same "blueprint". Both appear as if they might depict the moon when it is illuminated from the lower left when one views the map or views the crescents facing north. Both crescents are on the northern part of the mound group, as if they were meant to be viewed facing north. As such both art pieces would seem to represent the moon in its "left-hand" phase to use the ancient method of determining whether a moon is in the waxing or waning phase. Therefore both would seem to represent the waning moon rising in the east just before dawn. (The crescent is the wrong way around to represent the setting new moon in the west.)



Mound #31
and Rock
Crescent at
Lizard Mound
Park.

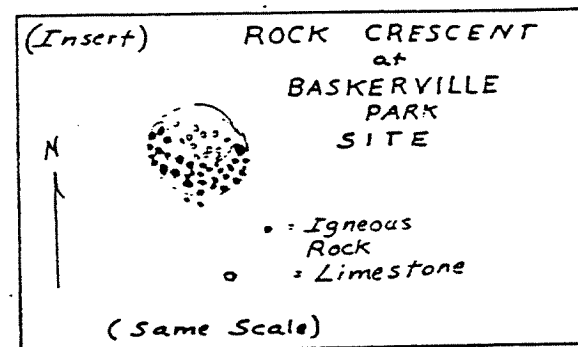


Figure 1 Rock
Crescent at Lizard
Mound Park Compared
to Rock Crescent at
Baskerville Mound Park

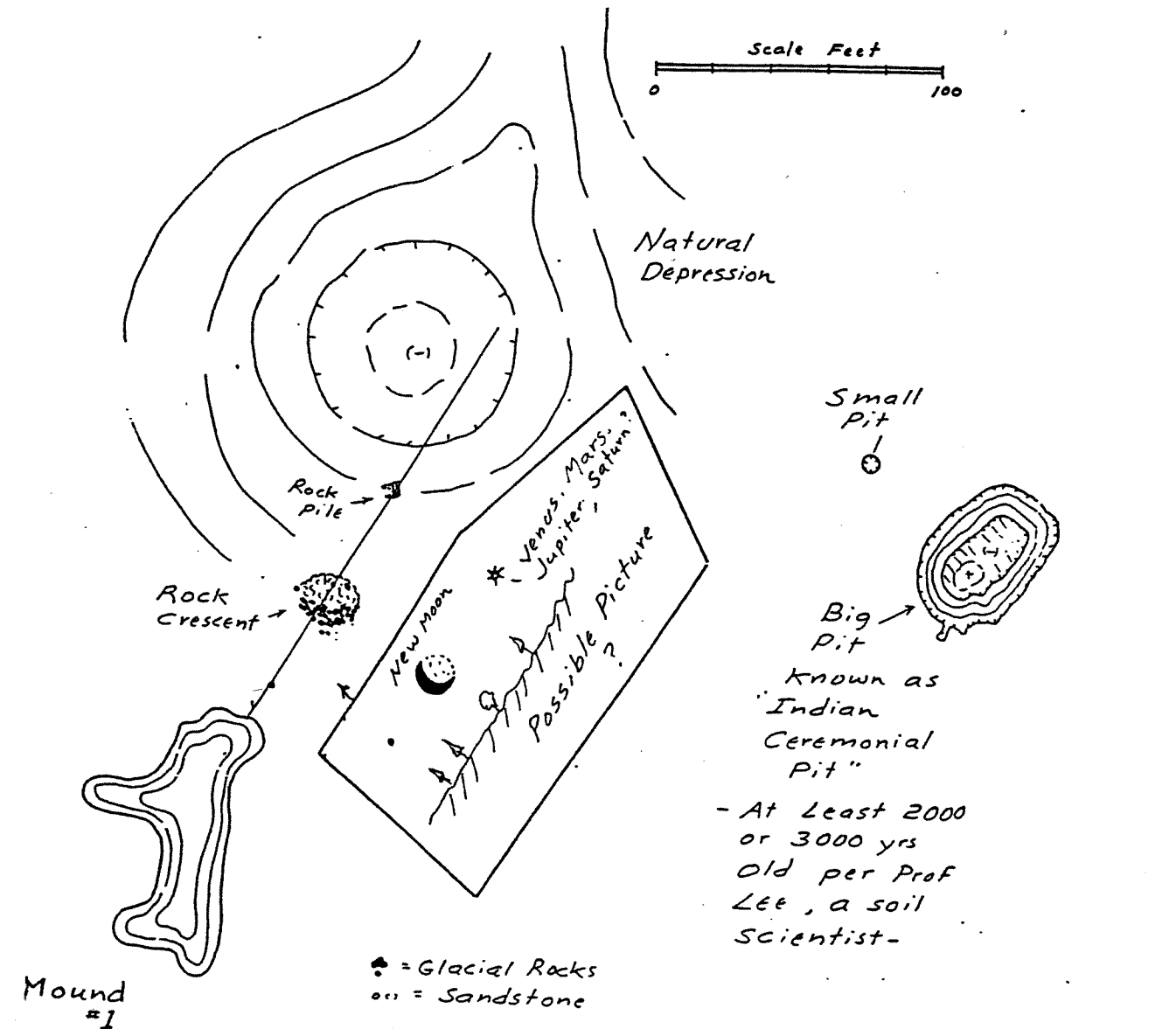


Figure 12 The Lynx mound looking
at Rock Art that may
possibly represent the crescent
moon and planets (Baskerville
Park Mound Site, Middleton, Wisc.)

Note: Mound #1 has sometimes been called the "Bear" mound. However, after careful mapping we conclude that the shape is quite different than the traditional bear mound style as shown, for example, in Figure 9 of Annex B. We call mound #1 the "Lynx" mound.

Mounds and Latitude Angles (Eagle Rock Report)

page 18

Figure 14 shows how true north can be likewise determined by laying off a 60 deg. angle clockwise from the centerline of the tail of a prominent panther mound (Md1) at Lizard Mound Park (near West Bend, Wisconsin). This true north-south line makes an angle of 46.5 deg with the tail of the straight tailed bird mound (Md2). The co-latitude of the site is 46.5 deg. This is the angular distance that the site is from the north pole of the earth. (See Figure 15). Also note that the angle between the wings of the two bird mounds corresponds to the maximum declination of the sun on the solstices (about 23.5 deg).

Figure 17 shows some geometry of the effigy mounds in the University of Wisconsin Arboretum. The alignment of mounds #1 and #3 are 60 deg. and 30 deg. from the true cardinal directions. Md #2 is 51.5 deg. from true east, the angle that creates the ancient Golden Ratio.

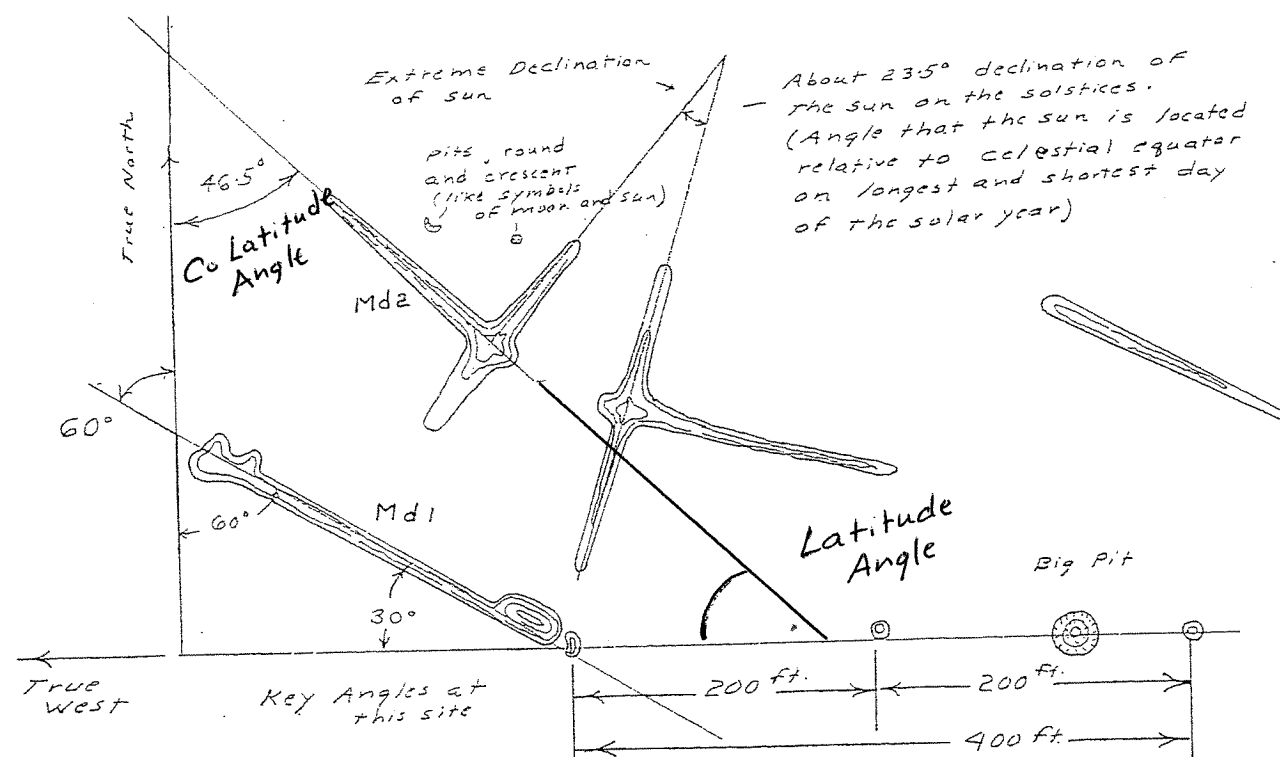


Figure 14. Some angles in layout of effigy mounds at Lizard Mound Park (West Bend, Wisc.)

--Also note distances of 200 and 400 statute feet. 100 ft is called an "engineering station" which was used to lay out the highways on the way to Lizard Mound Park.--

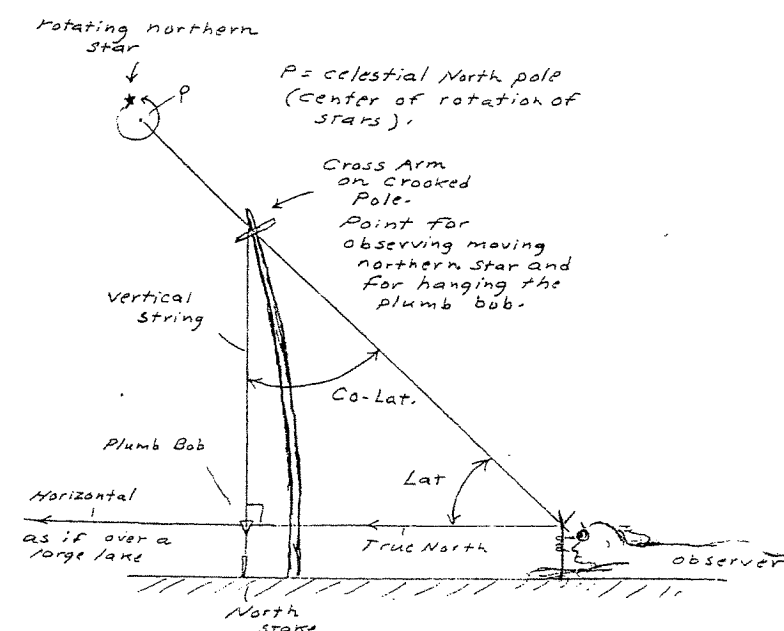
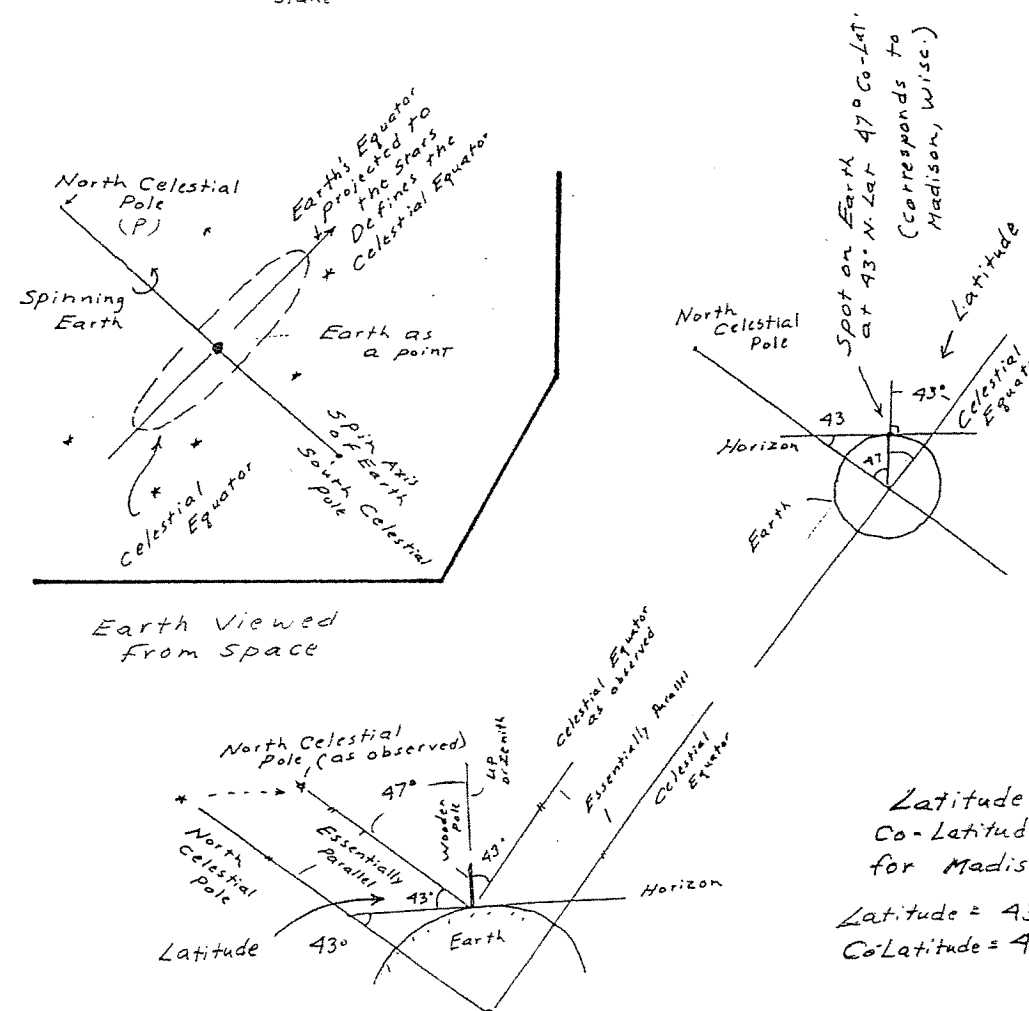


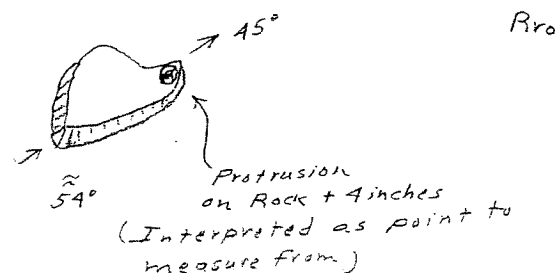
Figure 15.
A Leaning Pole,
and Latitude and
Co-latitude of a Site

(See Figure 16 for a traditional leaning pole.)



Latitude and
Co-Latitude Angles
for Madison, Wisc:
Latitude = 43°
Co-Latitude = 47°

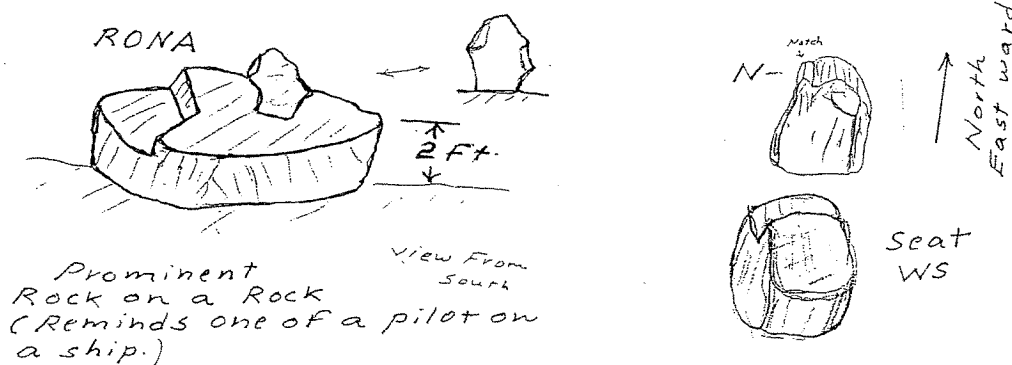
Figure 20 shows more alignments corresponding to those on a Mariner's Compass in the layout of organized rocks at another site in Wisconsin (the same site associated with Figure 16). Here both the prime base line alignment of 45 deg. and the alignment that corresponds to the latitude of the site are defined on the north end by a very special rock in the shape of what I call the Crooked Mountain Symbol.



Feature which defines North end of lines 45 deg. from True North and the line that corresponds to the latitude and co-latitude of the site.

There are about a dozen Crooked Mountain Symbols at this site, but the one shown in the above sketch is very special. It has a protrusion on the center of the nose. This led us to check whether the center of the nose of the other Crooked Mountain Symbols could also be used as a precise survey point, like a modern survey stake. Indeed at this site, this was the case. There are a number of triangles at this site defined by the noses of the Crooked Mountain Symbols that can be used to create triangles which will quickly give Golden Ratio geometry, and workable values for 1 deg (which we need to create the divisions of the circle still used on protractors and on my field surveying instrument).⁵

It is of interest to note which rocks mark the southwestern end of the lines which correspond to alignments of 45 deg. and the latitude of the site shown in Figure 20. These are shown below:



⁵ There is no question that the circle divided into 360 deg. was already present before the pyramids of Egypt were constructed. For example, see *Secrets of the Great Pyramid*, by Peter Tompkins. It is said that the ancients used the Pentagram to create an accurate value of the degree. And the division of the circle into degrees came down from those times to us today. In the 1800s, it was proposed that the new French metric system be adopted in the United States. But Jefferson, Franklin, etc. said that the metric system, which divided the circle into 400 parts, did not have the harmony of the ancient system where time was also incorporated into the metrology. (360 deg. corresponds to the 360 days of the solar year plus five dead days used by ancient Egyptians, Sumerians, Babylonians, Olmecs, Mayans, and Aztecs, as well as in India and China). Therefore, I have the romantic 360 deg. division on my surveying instrument, while surveyors in France may be using a division of 400 grads.

Rocks and Latitude Angle (Eagle Rock Report)

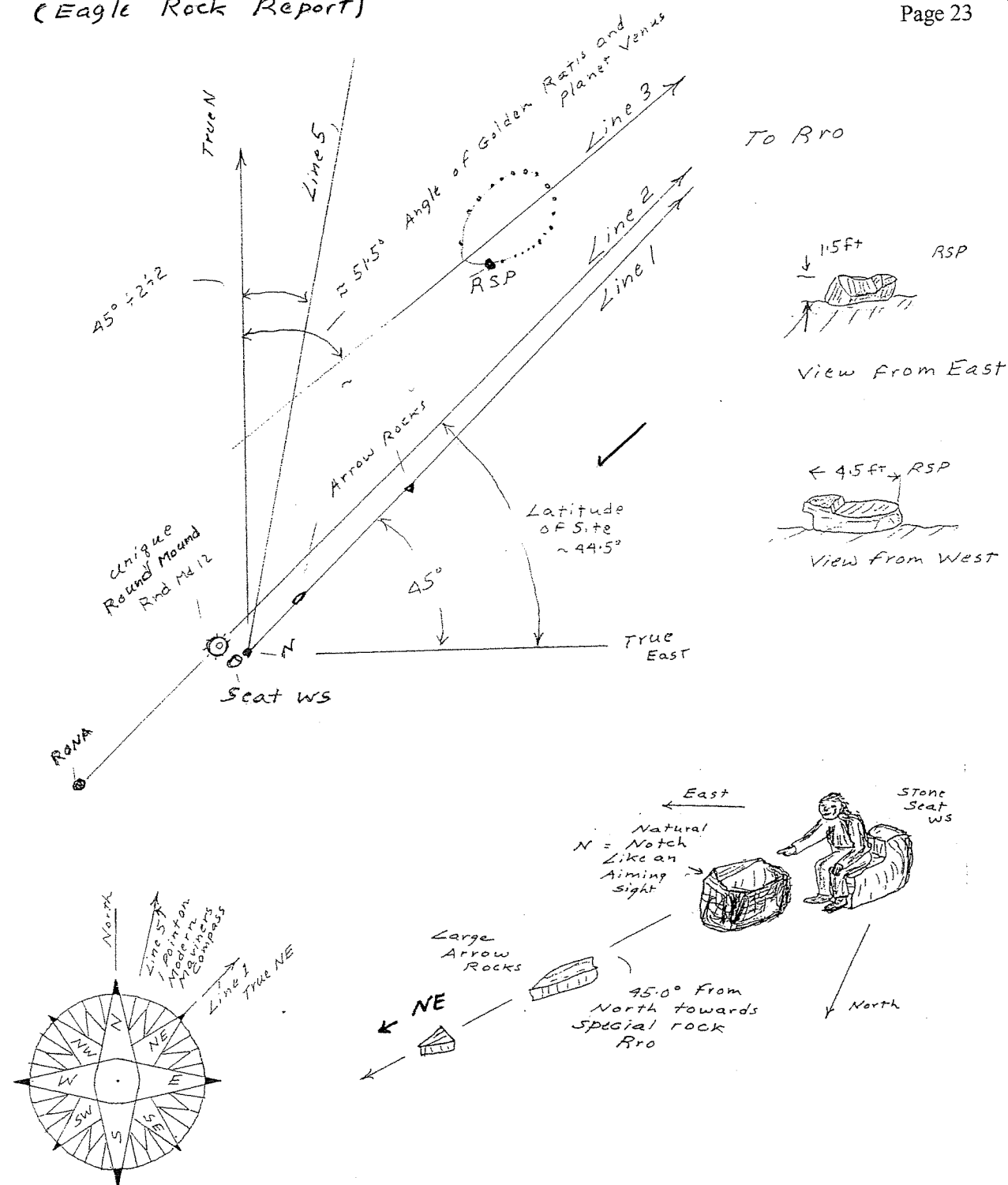


Figure 20. Lines corresponding to 45 deg. and Latitude at a Site in Central Wisconsin

Attachment #4

Extending the Centerline of Teotihuacan

© Copyright, James P. Scherz, 8 April, 2011

If the alignments from the Bighorn Medicine Wheel to sites east of the Mississippi River are not a mere coincidence, then ancient wise ones associated with the Cheyenne tribe knew how to calculate such long range alignments. If that is true, then we would expect that ancient wise ones from other parts of the New World, besides in Montana, might have been able to do the same thing. We will test this possibility by checking what may be a purposeful alignment encoded into one of the largest of New World ceremonial centers, the site of Teotihuacan.

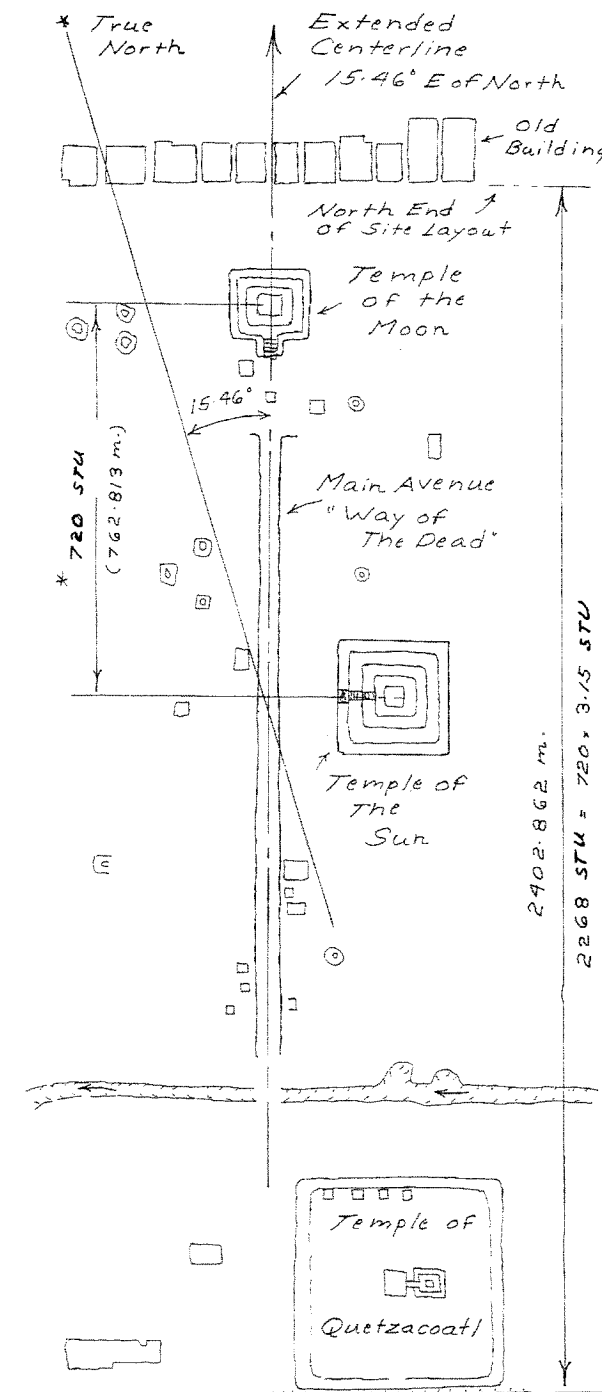
The ancient New World site known as Teotihuacan was once a very important ceremonial and trade center in what is now Mexico. Holes carved into the corners of the walls of an open patio at Teotihuacan suggest ropes stretched in grid fashion for students to sketch the stars. Astronomy must have once been taught at this place. Also, exquisite pottery and tools from obsidian and copper were made here, and were once traded widely. At one time, it must have been a very important cultural and trade center, as well as a place for traditional ceremonies, and likely education (as at what we would today call a college). Hugh Harleston, Jr., of Mexico, and John Michell from England, have reported that the longer Hebrew Sacred Cubit or Sacred Rod (as found at Stonehenge) is also the basic unit used in the layout of Teotihuacan. If this is true, then we might expect ancient trans-Atlantic contact before the days of the Norse, by the same routes they used, i.e., via Greenland.

Two of the largest architectural structures at the site are the Temple of the Sun (said to be 18 stories tall) and the Temple of the Moon (about 140 ft. tall). There is also a large complex dedicated to the hero and god Quetzalcoatl, the plumed serpent. The entire complex, about 2.4 km. long, was laid out on a grid that is not oriented true north, but about 15.5 deg. east of true north. See Figure 1. It is the centerline of this main avenue that we will trace in this Attachment #4. And we will also investigate sites along this line with latitudes which may be encoded into the architecture of the multiple tiers of the Temples of the Sun and the Moon.

Teotihuacan is located about 20 miles northeast of present day Mexico City. It was abandoned by the time that the Aztecs took over in this part of Mexico in about AD 1300. It is said by the Aztecs that the site is where "men became gods." In the days before the end of matrilineal lineage and matriarchal rule (which continued in North American culture into historical times) this connotation may have had various meanings. The prefix "Teo" to me seems Indo-European, like Teo in the "Teo-tonic", the tongue of Germanic tribes with roots to languages from northern India. The word Teotonic to me connotes ancient or honored tongue.

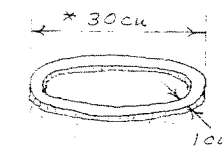
The last part of the word Teotihuacan is really pronounced like "Teo ti Wakan. The "Wakan" part is recognized in the far north by the HoChunk and Sioux (and other tribes which share the same language root) as associated with a word connected with "snake" or "holy."

According to Grondine, the name "To Wakon" or "T Wakan hah" was the name once used for the ancient ceremonial center at the mouth of the Missouri River, where the so-called Mississippian culture later (from about AD 800 to AD 1350) built the giant Monks Mound at what we today call Cahokia (Grondine, p. 455). They also had copper workshops.

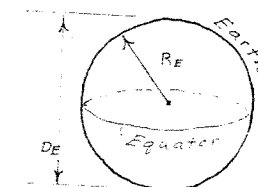


STU = standard unit of layout; about 1.059 meter (say 1.06 meter) 1.06 m = 3.48 ft. As pointed out by John Michell, this length also corresponds to the ancient 'special cubit' or 'rod' in the layout of the Sarsen Ring at Stonehenge.

this cubit of 3.48 ft is $\frac{1}{6,000,000}$ of the polar radius of the earth. (also $\frac{1}{12,000,000}$ of the mean polar diameter of the earth)



Stonehenge
CU = 3.48 ft
* Note that $720 \text{ STU} \div 30 \text{ STU} = 24$.

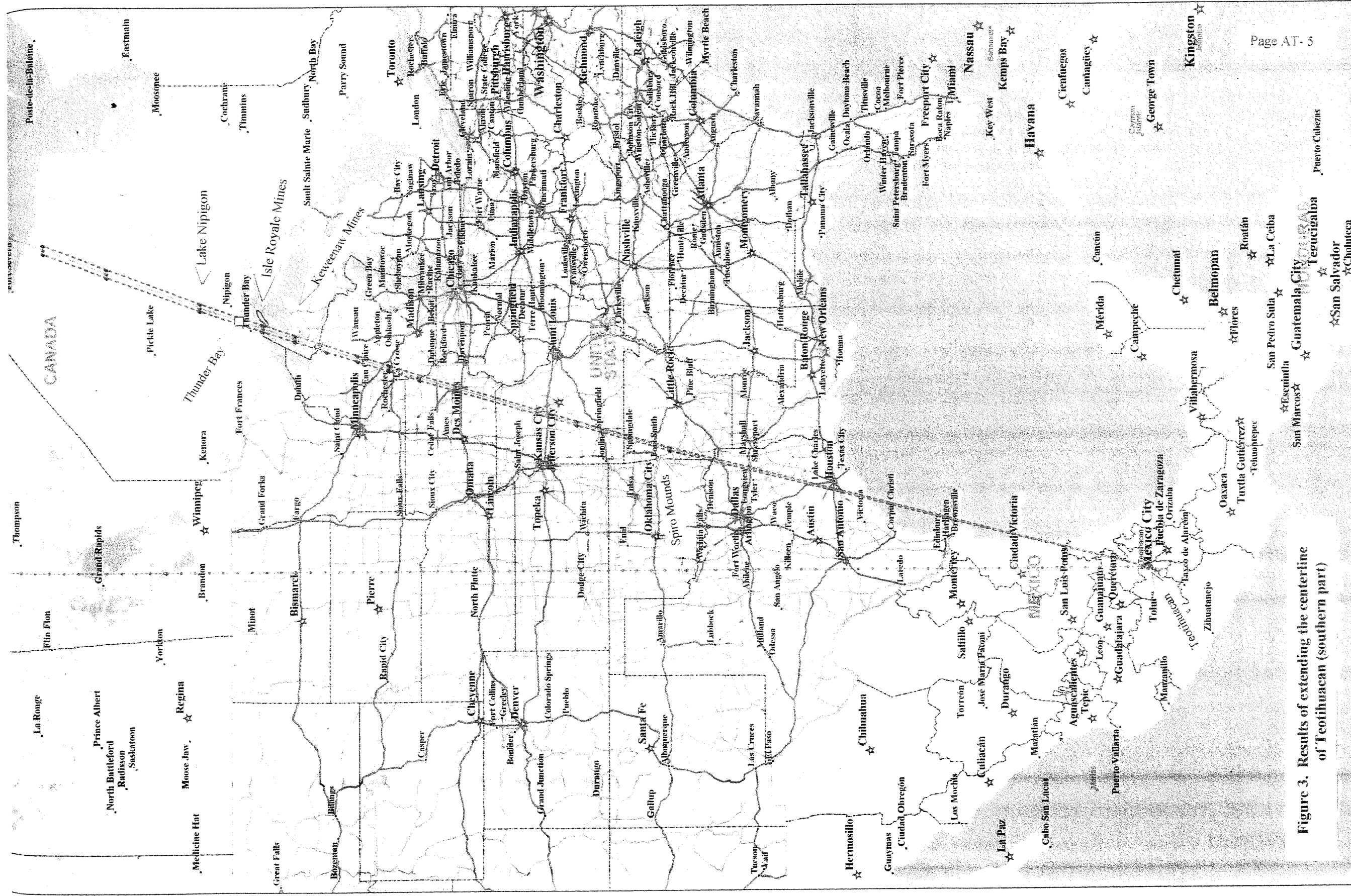


$R_E = 6,000,000 \text{ cu}$
(polar radius)
 $D_E = 12,000,000 \text{ cu}$
(polar diameter)

Figure 1. Layout of Teotihuacan

-- (The map on the left is from work by Hugh Harleston, Jr., in Tompkins 1976, p. 238, 239.

Part of the data on the right comes from John Michell, 1983.)--



(Eagle Rock Report)

In the 1800s and 1900s, archaeologists found the city called Tula, Hidalgo, about 40 miles from Teotihuacan, and assumed this must have been the Tol, Thul or Tulan in the Indian histories. They excavated the site and called its inhabitants (who built it in about AD 800 to 1000) the Toltecs. These are definitely not the early Tultecs or Tultecas in the histories of Ixtlilxochitl, who mentions dates from the AD 300s. So some academic scholars today refer to the histories of Ixtlilxochitl as unreliable because they do not match the archaeological data. In my view, the problem is not with Ixtlilxochitl, but with the archaeologists who assumed that the city of Tula, Hidalgo, near Teotihuacan is the Tulan of the ancient Indian histories. Once a mistake is made by academic authorities, it tends to be perpetuated and vigorously defended.

We should not forget that migrating people carry place names with them. The Pilgrims who established Plymouth, Massachusetts, in the 1600s, departed from Plymouth, England. And their descendants moved westward, creating cities called Plymouth in many states.

We can wonder about some future archaeologists excavating Plymouth, Wisconsin, along Lake Michigan, and trying to correlate the archaeological data with stories about the Pilgrims landing at Plymouth Rock. They would probably conclude that the stories are unreliable.

What might be significant and what might not be, along the extended centerline:

In any case, it is a fact that the extended alignment from Teotihuacan goes precisely through Thunder Bay, gateway to the rich copper deposits on Isle Royale, and also important in the later historic Fur Trade. It also goes through the western ends of Isle Royale, and the Keweenaw Peninsula, source of the ancient copper. It also goes through the western end of Greenland, making a direct hit on the US Air Force bay at Thule, Greenland. But unless we knew that there had been an important archaeological site there before the air base, we must discount this correlation. The line goes just to the east of the important prehistoric trade center at Spiro, Oklahoma, and also near important ancient sites in Wisconsin. As we examine the probable latitudes which might have been encoded into this line, we will see if any of these sites may have been intended in the layout.

There may be Encoded Values for Latitudes along the Line.

Figure 1 shows the orientation of the Way of the Dead at Teotihuacan. Also shown are the locations of the Temple of the Sun, the Temple of the Moon, and the temple of Quetzalcoatl, the plumed snake god, which is decorated with images of snakes. Figures 12 and 13 show the sketches of the angles of the different steps of the temples of the Sun and Moon, as they now exist after some significant reconstruction in the 1960s. It seems logical that these angles might represent sites along the extended centerline where the latitudes or co-latitudes correspond to these angles. We will pursue this possibility.

As shown in Figures 12 and 13, the sloping sides of the first tier or base of both the Temple of the Sun and the Temple of the Moon make angles of 43.35 deg. from the horizontal. Protected by erosional debris, these are probably the most reliable values. Besides the angle of 43.35 deg., which is repeated two times, we also see the value of 46.65 deg., repeated three times. Note that these two angles are complements of each other.

Besides angles of 43.35 deg. and 46.65 deg., we also have angles of 41.4 and 41.6 deg. for an average of 41.5 ± 0.1 deg. There are also angles 45 deg., 53.13 deg. and 55 deg. At both the Temple of the Sun and the Temple of the Moon in Tier #4, there are special angles of 70.31 and 70.53 deg., for an average of 70.4 deg. Granted, these angles come from the temples after they were reconstructed. But we will use the above angles in our analysis and let others argue over whether they might or might not have been the original intended values.

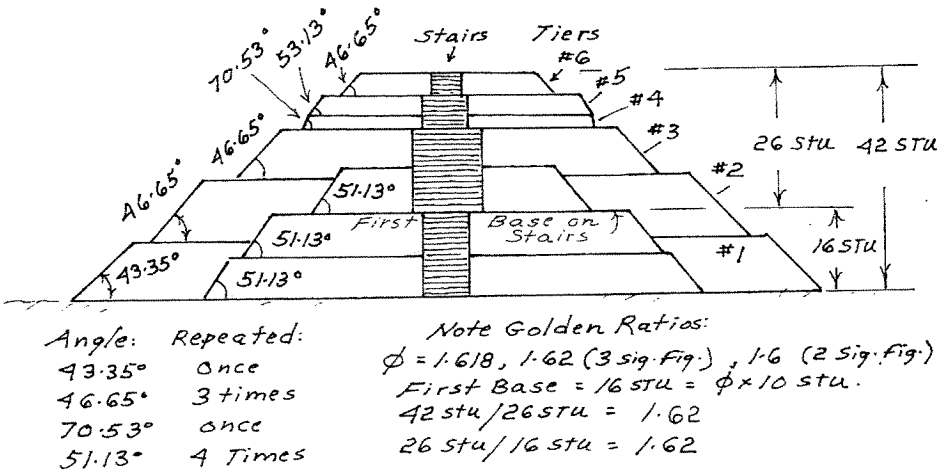
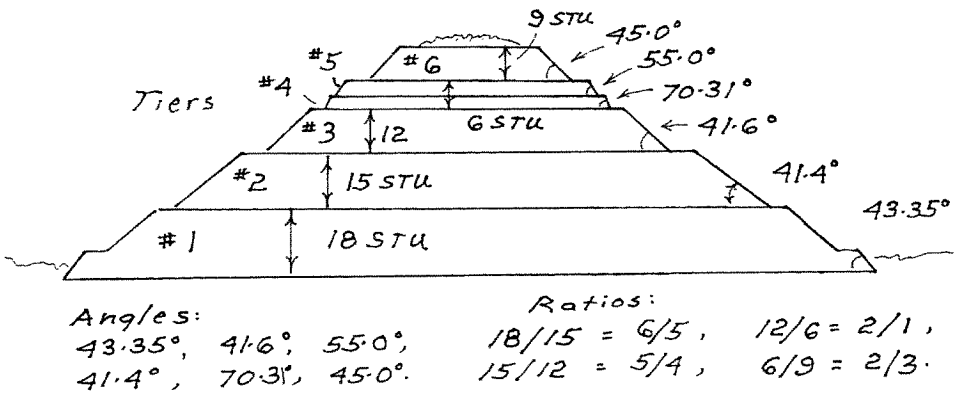


Figure 12. Angles encoded into the tiers of the Temple of the Moon
View as seen by someone walking northward along the "Way of the Dead"
--(From work by Hugh Harleston, Jr., Tompkins, 1976, p. 246)--



In 1906, there was "a thick sheet of mica covering the top of the fifth body," which was removed during reconstruction. (Tompkins, 1976, p. 202) This is significant because mica was reportedly once used as signaling mirrors, essential for establishing long-range alignments.

Figure 13. Angles encoded into the tiers of the Temple of the Sun
--(From Tompkins, 1976, p. 251)--

(Eagle Rock Report)

9
5
sin

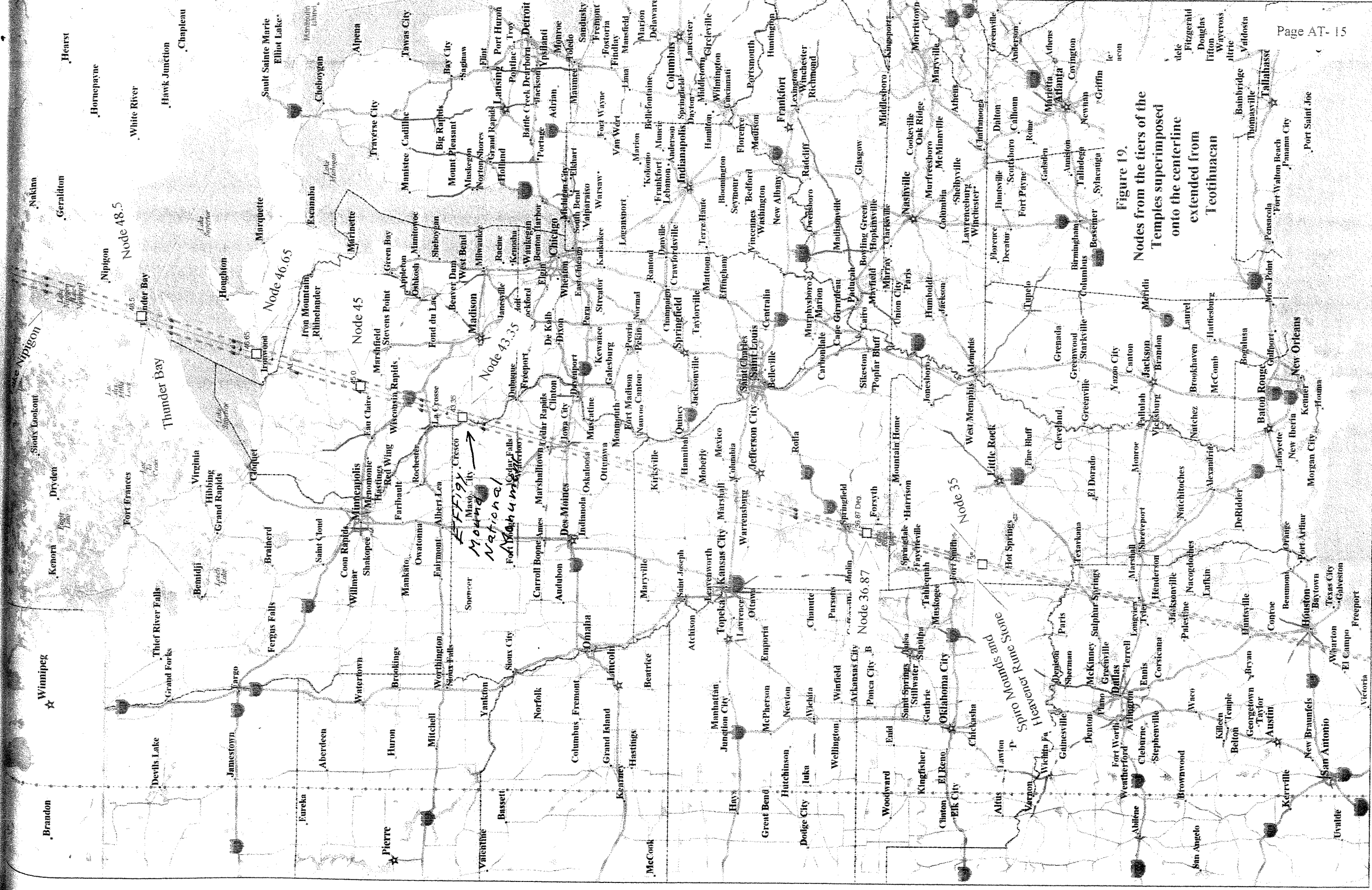


Figure 19.
Nodes from the tiers of the
Temples superimposed
onto the centerline
extended from
Teotihuacan

Scale 1 : 6,400,000
1" = 101.01 mi
Data Zoom 5-0

Eagle Rock
Report

Summary and Conclusions:

The purpose of this Attachment was to see if there is evidence of other long-range alignments in the New World besides those from the Bighorn Medicine Wheel. The extended centerline of Teotihuacan was tested. When extended, this line makes a direct hit on Thunder Bay at the border between Canada and the United States. This was an important water node in the Fur Trade. It would also have been important to pre-historic copper traders once carrying copper nuggets from the numerous ancient mines on Isle Royale.

To me, this correlation seems important. Various long- range alignments from the Bighorn Medicine Wheel align directly to major nodes in the ancient water routes--Mouth of the Missouri River, Mouth of the Wisconsin River, Mouth of the Black River, the Bellot Strait lined with dolmens that gives the southernmost route between the waters of the North Atlantic and those of the North Pacific, etc. But on most of these long- range alignments which make direct hits on ancient water route nodes, are other near direct hits to important ancient ceremonial sites, such as Bear Butte, Devil's Tower, the Moose Mountain Medicine Wheel, etc. This only would have been possible if a great deal of thought had been put into where the Bighorn Medicine Wheel was located so that these multiple functions would be possible.

In a similar manner, we see intriguing multiple correlations in the extension of the centerline of Teotihuacan. Although the line makes a direct hit on Thunder Bay (an extremely important water node) it also passes near the once important trade center of Spiro, Oklahoma, and the largest concentration of effigy mounds along the Mississippi--a location today honored with Effigy Mounds National Monument.

Angles encoded into the tiers of the Temples of the Sun and Moon at Teotihuacan suggest sites with similar values for either latitude or co-latitude. A bit of study shows that the angles from the horizontal in these tiers appear to correspond to the co-latitude of the sites. Using these angles to determine latitude along the line, we again have a near perfect hit in the center of Thunder Bay. Another significant correlation is at Node 46.65, making a near direct hit on Porcupine Mountain, important in Native American traditions. Two other important correlations occur at Node 43.35 (near Effigy Mounds National Monument) and Node 35 (near Spiro Mounds). The alignment we call Line 8 from the Bighorn Medicine Wheel also encompasses the area of Effigy Mounds National Monument.

To me, this supports stories told by Native Americans that the entire continent of North America had been mapped by ancient native surveyors (for example, see Carriere p. 141). The obvious question to be asked is how was it done. Indeed, it could have been done with nothing more elaborate than poles, ropes, plumb bobs, and a keen understanding of the earth and the moving heavens overhead. Key to such work would have been to determine differences in longitude, which Prof. Stecchini (Tompkins 1971, p. 176) says the Egyptian surveyors could do in about 2000 BC. (And in about AD 1000, Al-Biruni said that cities on maps along the Silk Road showed both latitude and longitude. He further said that the maps of India, China, etc., used the same prime meridian for longitude.)

Version B of this report addresses the issues of longitude and the harmonious units of earth measure associated with longitude (including the ancient statute foot). Another unit is the so-called longer Sacred Hebrew Cubit or the Sacred Hebrew Rod, which Harleston and Michell say was shared between the Old World and the New.

Version C of this report addresses other aspects of ancient "sacred geometry" which come from studying the layout of the ancient New World sites. Interestingly, a bit of research shows that the same geometry was evidently taught by the Old World priesthoods and mystery schools. But such information was purposely kept from the common people and the masses, who even until the days of Columbus believed that the earth was flat.

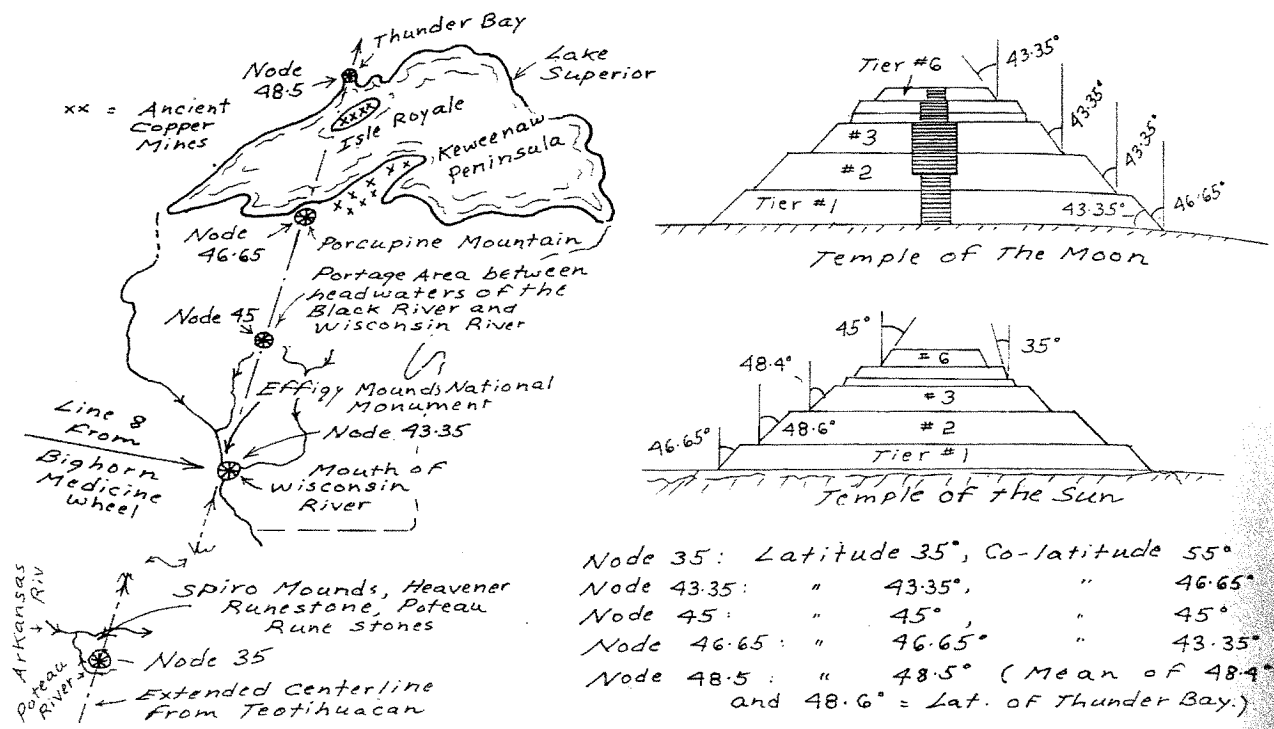


Figure 28. A summary of the geometry along the extended centerline from Teotihuacan

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