

Vikings in Sop's Arm!

Authors; Kent Budden and Erik Torpegaard

Introduction. Kent Budden grew up in Sop's Arm, White Bay, Newfoundland. He has two degrees from Memorial University of Newfoundland. An arts degree in French and geography and an education degree. He has worked as a teacher for the past seventeen years. Over the past six years he has been investigating the possibility of the Vikings being in Sop's Arm and he has explored the area extensively. He has researched the great Norse Sagas, in particular the Vinland voyages; stories of the Viking's westward expansion to North America. He is the owner of a rare Viking book collection that contains the Vinland Sagas' earliest translation into English. He is the author of two books about Vikings in Sop's Arm, "Vinland Discovery-the unfinished story" and "Vinland Discovery-the unfolding story". In them he argues that Sop's Arm, is in fact, Vinland (Straumsfjord) of the great Norse Sagas. As proof he offers many pieces of evidence such as matching geography with the great Norse Sagas, caribou pitfalls, Ingstad's Favorable comments, stone house foundation sites, burial mounds, and much more. He is the discoverer of many ancient artifacts in the Sop's Arm area. One of them is an amazing sunstone.

Erik Torpegaard is a Danish engineer and computer programmer. He has written articles about Viking navigation, and mapping, using bearing dials and sunstones. He is the owner of a bearing dial obtained from Soren Thirslund, a man who was closely associated with the archeologist C.L.Vebaek, who discovered another bearing dial in 1948 at the Eastern settlement, Greenland. (Hometown of Erik the Red and his son, Leif the lucky). The bearing dial belonging to Erik is made of sandstone, the one discovered by Vebaek is made of wood. The one of wood has been carbon 14 dated to around the year 1000 A.D., by the university of Copenhagen, Denmark. Both dials are showing the same basic areas, just that one is tilted 30 degrees more than the other, showing they are originals. The one of wood contains an earlier map and only shows the north western half of Newfoundland. The one of sandstone contains a map of the same area ,but now shows the entire island of Newfoundland and parts of Nova Scotia, telling us this bearing dial has likely been made a little later than the one of wood. Both bearing dials show Sop's Arm as a special place.

We have been working closely together since our introduction in mid August, 2005. We have done much research, investigation and experimentation.

At the conclusion of this article we will have shown; One-that the stone discovered at Sop's Arm on August 26,2002 is in fact a sunstone, commonly used all over Scandinavia during the Viking age. Two-that the same methods have been used on the sunstone as on the bearing dials, proven Viking navigational instruments.

Three-that the organization of the Sop's Arm site is the same as the organization of many other Viking sites throughout Viking age Scandinavia. Four- that the Vikings have been in Sop's Arm and used it as their base for map making and exploring the rest of Vinland.



Figure 1. The sunstone

This is a picture (figure1) of the incredible stone discovered by Kent Budden at Sop's Arm, Newfoundland on August 26, 2002. After much investigation and analysis, it is our hypothesis that this is an incredible multi-functional masterpiece, made by very talented Viking age craftsmen. It is three feet high, twenty inches wide and two -three inches thick. It was found knocked over, lying face down, and nearly completely buried. The picture above is one of the very first pictures ever taken of this amazing stone. It was taken after the stone had been rolled over the day of it's discovery. The picture has been placed in the upright position to allow readers a better understanding of how the stone was meant to work.

First of all this stone is what is known as a sunstone, a stone used to observe and measure the passage of the sun across the sky, as it appears to move from east to west throughout the day. Sunstones were commonly used all throughout Scandinavia during the Viking age. Here's how they work. The stone must be placed at a location where the sun is visible all throughout the day, from sunrise in the east to sunset in the west and all points in between. This stone was found at such a location. The Vikings

knew, as did all ancient mariners, that the sun at high noon is at its zenith, and is always showing the direction south. The stone was setup facing towards the noonday sun. An arrowhead is carved or fashioned onto the stone, with the arrowhead pointing south towards the noonday sun. Now that they knew south, they also knew the other directions. The other two points of the arrowhead point to east(left) and west (right). An ingenious ancient compass. See figure 2.

It also acted as an ancient calendar. See figure 3. On the left (east) side of the stone there are three holes. Each of these holes represent the height of the noonday sun at special times of the year. The hole closest to the top of the stone(south) represents the height of the noon sun at summer solstice (when the sun is highest in the sky), the middle hole represents the height of the noonday sun at both the spring and fall equinoxes, and the hole at the bottom of the stone(north) represents the height of the noonday sun at winter solstice (when the sun is at it's lowest in the sky). Throughout the year the sun's rays would find these holes and be reflected back onto other stones behind the sunstone.

The four special times of year are represented by three special marks on these stones. Fall and spring equinoxes share a special mark, just as they share a hole on the sunstone.

By comparing where the sun's rays are now reflected to the special points on the stones behind, they could tell the height of the sun and therefore the season of the year. As a bonus they didn't have to burn their eyes looking at the sun trying to figure it out. The height of the sun could also be found by observing the shadow cast by the sunstone at a fixed time of day (noon) compared to special marks on the stones behind the sunstone.

Knowing the sun height also helped them know their latitude. Knowing the

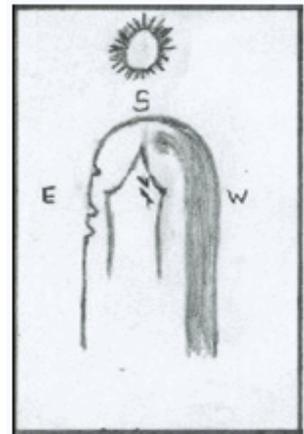


Figure 2. Compass.



Figure 3.
Calendar and sun
height measuring.

time of year was very important to them because they could only sail back home to Greenland in the summer and early fall because of the icy water conditions of the north Atlantic in winter and early spring.

A second hypothesis of how it worked as a calendar is that the stone would be placed on its back with the arrow tip pointing towards the south (noonday sun), and from a fixed point, somewhere to the west of the stone, the sunrise would be observed. See figure four. The holes now represent the sunrise at the four special times of the year, again with the middle hole representing both spring and fall equinoxes. This time the hole closest to the bottom of the stone (north) represents sunrise at summer solstice. The hole at the top of the stone (south) represents sunrise at winter solstice. By comparing the position of the current sunrises to the three holes on the stone, they were able to tell what time of year it was. Both of these hypothesis demonstrate the calendar aspect of this incredible sunstone.

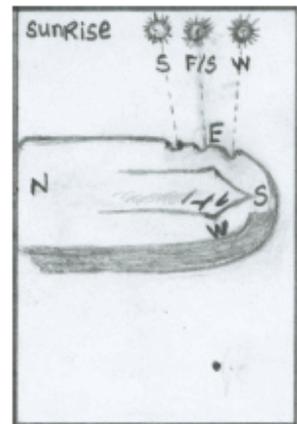


Figure 4. Calendar.



Figure 5. Ancient clock

Another aspect of this amazing sunstone is that it also acted as an ancient clock. See figure 5. Because it was positioned and aligned to the noonday sun (south), and the north star (north), it cast a very accurate and equal shadow both east and west of the sunstone. By reading the length and direction of the shadow cast by the sunstone, the Vikings were able to tell the time of day. The shadow was longest in the morning just at sunrise and in the evening just at sunset. It was the shortest at noon. It would be cast to the west in the morning and cast to the east in the afternoon. An ingenious ancient clock.

Another aspect of this amazing stone is that it is also a map. See figure 6.

On the stone a map of Newfoundland (Vinland) is clearly visible.

Although not as exact as maps today, it is surprisingly accurate. White Bay, Notre Dame bay, Bonavista Bay, and Trinity Bay are clearly visible, as are the Baie Verte and Northern peninsulas. The entire west coast is also quite obvious, as are the long range mountains represented by an elevated ridge running all up and down the left side of the stone (west coast of Newfoundland). The Vikings took the stone with them as they explored the shores of Newfoundland (Vinland). They would place the stone upon the beach and align it to the north star and or to the noonday sun, as it was aligned at the Sop's Arm site (their center). By aligning it to the north star and or the noonday sun, like they had at Sop's Arm, they always had an accurate reference point and could make an accurate map.



Figure 6. Ancient map.

They placed white seashell mortar at strategic points against the dark of the stone to create their map. The white represents the ocean and the dark the land. As they traveled the shores of Newfoundland making their map, the stone served another very practical purpose- it became a ballast stone- weighing about one hundred pounds. The Vikings left it behind in Vinland, not needing ballast when they sailed home because they would have had plenty of ballast from their cargo of timber, fish, and berries from Vinland.

In addition to all of this , this stone is also a rune-stone, a stone with runes on it. See figure 7.

Runes are the name given to the Viking alphabet also known as the futhark. The marks from this language are often described as being twig like markings-usually a series of straight lines with other lines coming off of the straight lines. The markings on this stone are twig like markings.- They are straight lines with other lines coming off of them. They run diagonally from left to right, top to bottom. The first two marks(runes) on the stone when translated into English, are T. K. According to the Sagas, in the year 1007 A.D. the Vikings sent a group of 160 people to colonize Vinland . Most of them were Greenlanders. Some of them including their leader were Icelanders. The leader's name was Thorfinn Karlsefni. His initials are T. K. It is his initials that have been discovered on this stone, and it is his homestead which has been discovered, the exact birth place of Karlsefni's son, Snorri, the first European child ever born in north America nearly 500 years before Columbus's discovery of North America.

This stone is also a territory marker. It showed other Vikings that this area belonged to Thorfinn Karlsefni. It was safe to visit, but if it was settlement that you wanted ,you would have to move on, this spot was taken. Only important people such as leaders and heroes were afforded such a stone marker. Ordinary Vikings did not have such monuments raised in their honor.

Another aspect of this incredible stone is that it is also a gnomon for measuring the noonday sun. (We have described this process when explaining the first calendar hypothesis. See figure 3). According to the Gragas, an ancient Icelandic law book, the Vikings left a gnomon, a center piece for measuring the noonday sun in Vinland, somewhere around the 49th parallel . Sop's Arm is on the 49th parallel. This stone, we believe, is the gnomon that the sagas say the Vikings left behind in Vinland. It may have also been a centerpiece for one of the bearing dials.

In addition to all of this, this stone also projects a great illusion, demonstrating the significant talent of the craftsmen who worked on it . It is made to appear as if the map and arrow are in the center of the stone, when in fact they are not.

The stone is also made to look like it is bulkier and thicker on the right side than it truly is. They have accomplished their illusion by the careful placement of varying colors of seashell mortar. This incredible artifact truly is a masterpiece in stone!

Figure 8 shows the two bearing dials. The one on the left belongs to Erik Torpegaard and was obtained from Soren Thirlund, a close associate of C.L.Vebaek. The one on the right is the wooden bearing dial discovered in 1948 by C.L. Vebaek, in the Eastern settlement, Greenland.

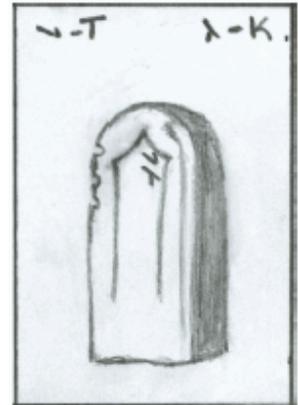


Figure 7.Rune-stone.



Figure 8. The bearing dials.

The Eastern settlement was the hometown of Erik the Red and his son Leif the Lucky. This settlement was also known as Eriksfjord and it was also from here that the 160 people led by Thorfin Karlsefni departed for Vinland to establish a colony around the year 1007 A.D. The dial made of wood has been carbon 14 dated to around the year 1000 A.D., by the university of Copenhagen, Denmark. They are proven Viking navigational instruments. Here is a brief description of how they work.

The bearing dial is complete as it was found, not broken. The shadow thrown from the inner edge (gnomon) at noon during the seasons is used for measuring the height of the sun observed from a given latitude and meridian.

The height of the sun is followed from the meridian connecting the home port and the destination port. They also had parallels to this meridian finding a sort of “longitude”. A meridian connecting the home port and the destination port was drawn on the point of amplitude for sunrise or sunset calibrated at winter solstice or summer solstice on the same latitude. When measuring the height of the sun (altitude) on known meridians and amplitudes (angles) during the journey, the Vikings had a pretty good idea of their position (latitude and meridian(longitude)). If the Vikings knew the latitude from the North star and they knew the height of the sun during the seasons at the destination port, they could travel the meridian just with help from the bearing dial, measuring the height of the sun during the journey.

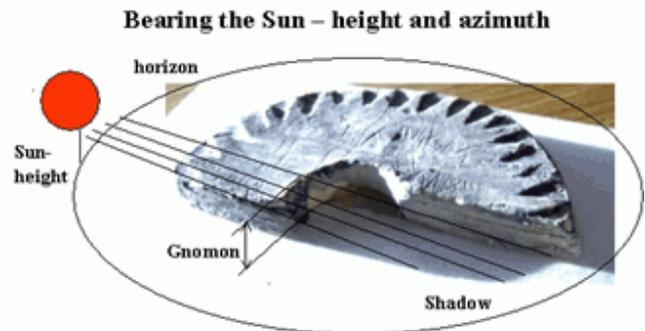


Figure 9. Bearing the sun at noon.



Figure 10.
Mapping Vinland

The sunstone and the bearing dial both use the same methods for measuring the height of the noonday sun. A system known as gnomonic shadowing was used. The inner edge of the bearing dial is the gnomon (center piece) for the bearing dial- see figure 9. The stone itself was the gnomon for the sunstone-see figure 3. By reading the height of the shadows cast by the gnomons (center pieces) at noon, they could determine the

The bearing dials are incredible, proven Viking navigational instruments. There are several incredible connections between the bearing dials and the Sop's Arm area, the Sop's Arm sunstone and the Sop's Arm sunstone site. Both dials contain maps of Newfoundland and they both have important meridians going through White Bay and the Sop's Arm area. The bearing dial of sandstone has a very important meridian running straight through Sop's Arm. See figures 10 and 11. This important meridian runs from the Viking's home port of the Eastern Settlement, Greenland to L'Anse aux Meadows and then to Sop's Arm, making Sop's Arm an important focal point for their navigating and exploring.



Figure 11. Important meridian.

height of the sun and therefore determine the season of the year and more importantly, knowing the height of the noonday sun combined with knowing the sun's amplitude (angle) they could determine their position north and south (latitude) at that particular point of measurement. By studying the length of the shadows cast by the gnomons (center pieces) throughout the day, they both could be used as clocks, telling them the time of day.

Another important function that the bearing dial and the sunstone have in common is their function as a compass. We have already explained

how the stone worked in this manner-see figure 2, and how the compass aspect of the bearing dials work in figure 9. The bearing dials are Viking navigational instruments for 3D measuring of the sun and the north star. The Sop's Arm sunstone was also used to measure the sun and the north star.

Another interesting thing the bearing dial and the sunstone have in common is that they both contain similar maps of Newfoundland (Vinland). See figure 12.

The map on the stone is seen directly on the stone and was likely used around the time of settlement. The map on the bearing dial is seen with gnomonic projection and was likely made sometime after initial settlement.

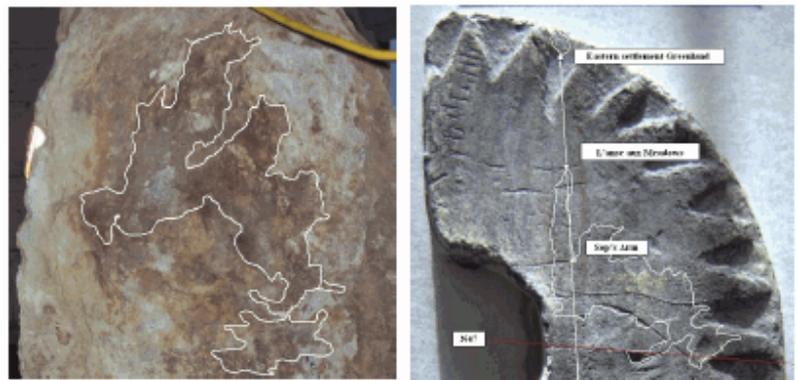


Figure 12. Maps of Vinland

Yet another interesting connection between the bearing dial and the sunstone is they both contain very similar "iron stains", maybe left behind from the iron tools the Vikings used on these stones. See figure 13.

In addition to all of the amazing evidence presented so far, the Sop's Arm sunstone site itself is also an incredible piece of evidence. See figure 14. It's construction, layout and methods used are the same as other Scandinavian sites from the Viking age, such as Trelleborg at Zealand, Denmark. The Sop's Arm sunstone site is an incredible observatory for observing the sun throughout the day and seasons, a center (base) for their mapping and exploring of the rest of Vinland, and a special place for calibrating their bearing dials in Vinland. The entire site is aligned to the noonday sun and the North star. The same celestial methods are used as on the bearing dial and the sunstone. Each building and geometric figure is



Figure 13. Similar "iron stains".

carefully positioned; nothing is random. Everything is placed very exact and for the purpose of taking exact measurements of the sun; sunrise, noon, sunset and other special times throughout the day and year.

Throughout the site special water wells were made for levelling purposes. They wanted to be as exact as possible for their sun measurements, mapping and calibrations. In addition to the sunstone being discovered at this site. The remains of at least two cairns, maybe three have been discovered. Also discovered at the base of these cairns was a bone with rune markings on it.

Cairns were used all throughout Viking age Scandinavia to make observations and measurements of the sun. They were used as a calendar to mark the seasons and as a clock to mark the time of day. Blessing a newly raised cairn with the magic marks (the runes) was also a very common practice throughout Viking age Scandinavia. All but one of their houses at this site is built running east to west, west to east-typical throughout Viking age Scandinavia. The houses have all been built with stone foundations, telling us it was meant to be a permanent settlement.

Longhouse B is the largest of the buildings at the Sop's Arm site. It is also the furthest to the East (holy direction for Vikings) and also closest to their burial mounds in the Northeast (the holiest of places for the Vikings). Their leader likely lived here. The western end of this longhouse is on a special meridian that goes from the sunstone in the south to the north star in the north. This is likely the same special meridian that comes from the Eastern settlement, Greenland to L'Anse aux Meadows, to Sop's

Arm as shown on the sandstone bearing dial.

High above the rest of the site there is a special "viewing platform" where they had a bird's eye view of the site below. The platform is perfectly aligned to the North Star in the North and to the sunstone in the South. From here they could make their precise measurements, be close to their deceased loved ones and enjoy the incredible view of the mountains around the fjord and the beautiful southeast channel to the open sea.

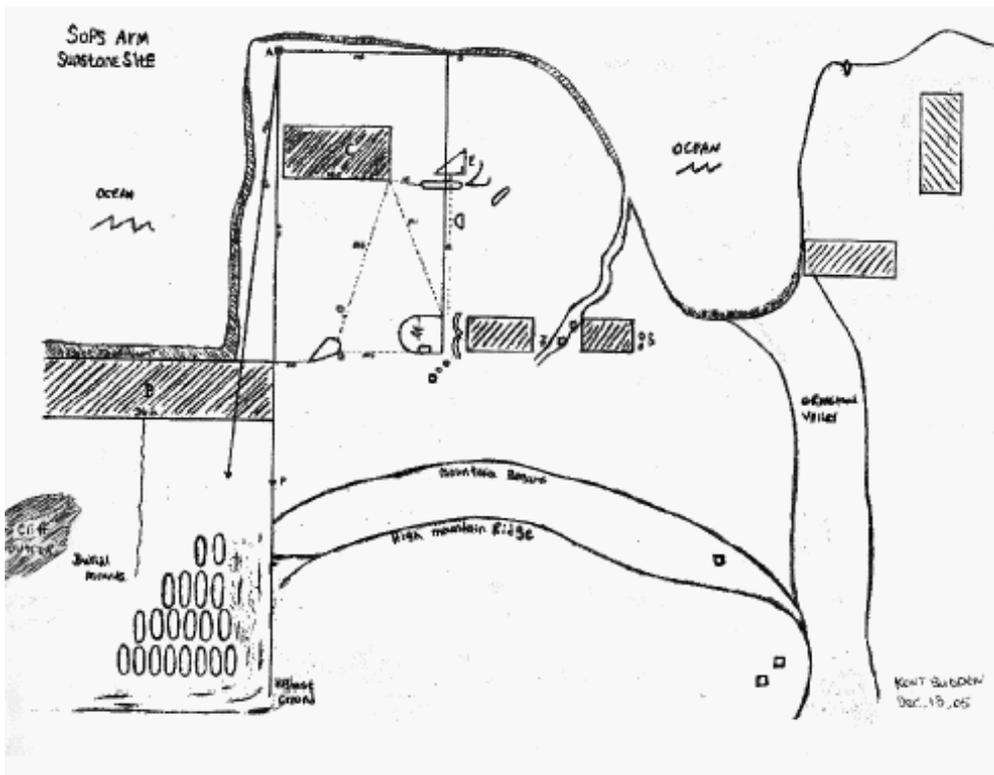


Figure 14. Sop's Arm sunstone site

Based on much observation and experimentation we have concluded that the latitude at which this amazing site and sunstone are found, is in harmony with Leif's expression from the Sagas when he first visited Vinland in 994 A.D.-"It was 'eykt' at 'skamdag' ", meaning the amplitude (angle) at this special place was just as far from 'eykt'(a special day mark of the sun)as it was at the home port in Greenland. We believe that this very special place is the Sop's Arm site, and from this special place as a center they have done their exploring and mapping all around Newfoundland and elsewhere.

Because of his initials on the sunstone, this site is no doubt the homestead of Thorfinn Karlsefni, leader of the Vinland colony established in 1007 A.D., and therefore the birthplace of Snorri, the first European child ever born in North America around 1010 A.D. (Snorri was Karlsefni's son).

Since Leif agreed to lend Karlsefni his houses in Vinland , this may also be the site of "Leif's booths" the first European buildings ever constructed in North America around the year 994 (A.D.). Again because of Leif's tendency to lend his houses in Vinland , his brother Thorvald and his companions also spent time here, as did Leif's sister, Freydis and her companions. Who is buried in the mounds at this incredible site? Is this the headland where Thorvald asked to be buried, after being struck by a native's arrow? Could this be the final resting place of the thirty Icelandic men and women that Freydis had killed in her evil plot of greed and deception? Or are these graves of those who died of natural causes during the course of their stay? Maybe it is all of the above or some combination of it. Maybe someday the incredible truth amount these mounds will be known!

For more information about Kent's story check out his books; volume one- "Vinland Discovery-the unfinished story" and volume two-"Vinland Discovery-the unfolding story" available for order at his website, www.vinlanddiscovery.com , www.amazon.com, and www.booksurge.com .

For more information about Erik Torpegaard's incredible bearing dials check out his website at www.etimage.com . Enlarge the pictures of the figures www.etimage.com/sopsarm here.

Kent S. Budden

Erik Torpegaard

Copyright March 19, 2006.