

Pictish Symbols

In Scotland hundreds of megaliths carved with beautiful unknown symbols survive from ancient times. The carved megaliths are known as Pictish Symbol stones as they were carved by an enigmatic people known as the Picts but unlike the hieroglyphs of Ancient Egypt, the Pictish Symbols still remain undeciphered. The reason why their meaning remains a mystery is that the earliest stones date to prehistoric times and not only is there no other known script carved alongside the symbols, no written description of the stones and their hieroglyphs by early Roman or Celtic historians exists. Very little is known about the Picts apart from their fame as warriors that successfully thwarted all attempts by the Romans to conquer their lands and their artistic work representing their symbols carved on stones, molded in silver, in the form of penannular brooches and pins and tattooed onto their bodies. Even the language spoken by the Picts apart from less than a dozen words is completely unknown and no stories that have been passed down through the ages give any clues as to the meaning of the stones and their symbols. We are left with a collection of carved symbols that can only be deciphered in complete isolation with the decoding based entirely on the form of the symbols and the possible significance of combinations of symbols carved together on stones. The degree of consistency in the representation of the symbols is remarkable, as if the symbols could not be interpreted differently and were known and perhaps seen by people geographically dispersed over hundreds of miles. When that concept is introduced and we consider the subject matter of many of the symbols such as the Eagle, Salmon, Goose, Deer, Dog, Bull, Bear, Wild Boar, Snake, Horse and Man himself alongside mythical creatures such as the Kelpie or Water Beast and several other unknown patterns and ask where such creatures both real and imaginary might be seen the idea that the only thing that could be observed so widely throughout Scotland simultaneously would be the stars and their constellations in the night sky. Of course, many of the known constellations today are associated with the same creatures as those carved by the Picts such as, Aquila, the eagle, Pisces, the fish, Cygnus (the swan rather than goose), Canis Major and Minor, as dogs, Taurus, the bull, Ursa Major, the bear, Draco, the snake, Pegasus, the horse and Orion, the hunter together with mythical creatures such as Monoceros, the unicorn, Centaurus, the centaur and Hydra, the sea monster. When the pattern of stars in the constellations is compared with the Pictish symbols, we find a remarkable match not only with the identification of the constellations as the same or similar creatures but also with the similarity of shapes of the symbols with the patterns made when the brightest stars in the constellations are joined by imaginary lines. The constellations were identified by our pre-historic ancestors as a pantheon of stellar deities that had an important role in their lives and their beliefs and their calendar of festival days.

Decoding the Pictish Symbol Stones

The Pictish symbol stones are megaliths carved with beautiful hieroglyphs by the prehistoric people known as the Picts, who in ancient times inhabited the country now called Scotland. The meaning of the Pictish symbols and the reason why these very large stones were carved is presently unknown. Two types of Pictish stone have been classified; namely the Class I and Class II Pictish Symbol stones. The more recent Class II symbol stones are decorated with both Pictish symbols and a Pictish or Celtic cross carved in relief that are believed to date to around 800-900AD corresponding to the time when Christianity became important in Scotland and also coinciding with the coming together of two separate peoples, the Picts and the Scots to form the nation of Scotland sometime around or after 843AD under the leadership of Kenneth Mc Alpin or his sons. The other, older carved stones are the Class I Pictish symbol stones which are decorated only with Pictish symbols carved as incised outlines into the surface of the megaliths.

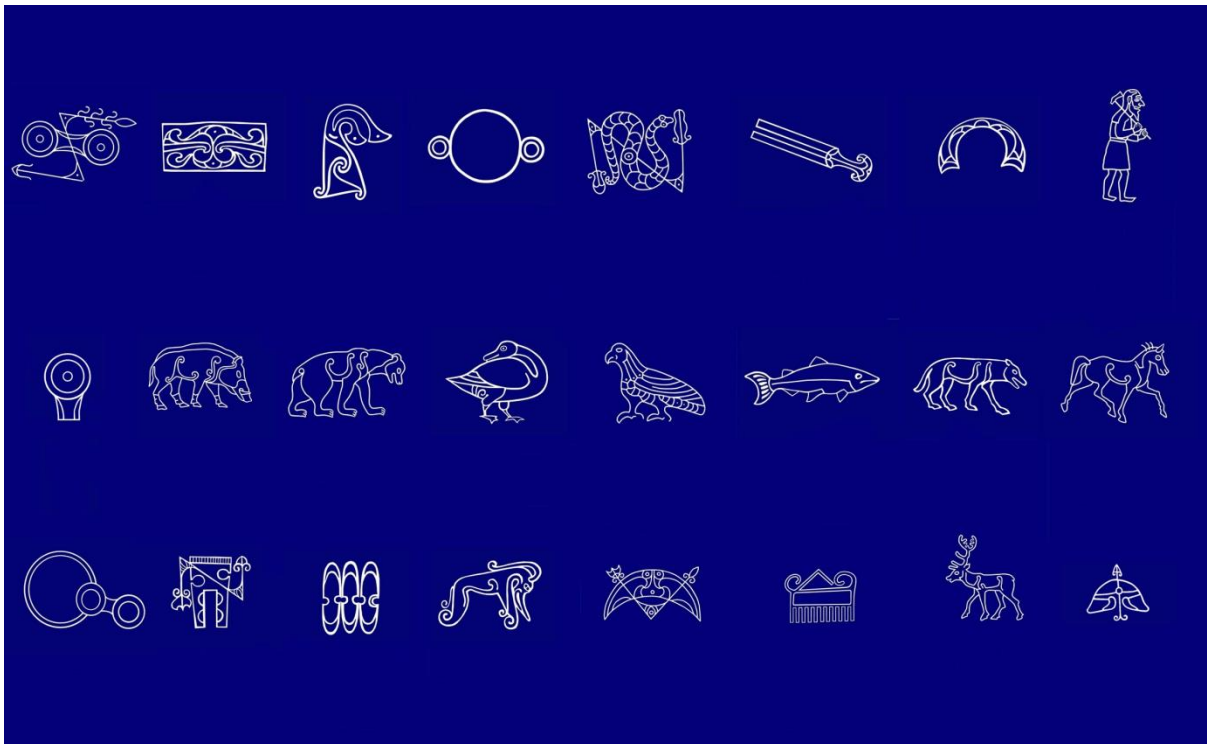


Figure 1. A selection of 24 of the most important Pictish symbols as represented on Class I Pictish Symbol Stones

Examples of the main Pictish symbols are shown in Figure 1 where they are currently popularly referred to (from left to right) as (top row) the Double Disc and Z-Rod, the Rug or Shield, the Flower, the Triple Disc, the Snake and Z-Rod, the Tuning fork, the Horseshoe, the Man, (middle row) the Mirror Case, the Boar, the Bear, the Goose, the Eagle, the Salmon, the Dog, the Horse and (bottom row) the Mirror, the Notched Rectangle and Z-Rod, the Triple Oval, the Beast or Kelpie, the Crescent and V-Rod, the Comb, the Deer and the Helmet transfixing an Arrow. The design of each of the symbols

is remarkably consistent throughout the widely dispersed collection of stones, suggesting that the symbols were important and well-known by the Picts and that there was little latitude to alter their design for artistic effect.

The age of the Class I Pictish symbol stones is unknown and there is currently no way of accurately dating when they were carved. Today they are generally accepted as being older than the Class II symbol stones dating to around 700 AD given a century or two based on stylistic similarities between the symbols and the artwork contained in illuminated books such as the Lindisfarne Gospels and the Book of Kells. Recent archaeological digs and dating of associated material suggests that the Class I Pictish stones could have been carved earlier around 300AD some 400 years earlier than the previously accepted date showing the great uncertainty in dating Pictish stones. This paper attempts to identify the meaning of each of the Pictish Class I symbols, proposes an even earlier date for their carving through a novel astronomical dating method indicated by the symbols themselves and suggests a possible reason why the Picts carved the Class I Pictish symbol stones in such numbers.

The symbols have been found carved on hundreds of megaliths throughout Scotland but by far the greatest concentration of stones occurs in the North East of Scotland.



(i)

(ii)

(iii)

Figure 2. Some examples of Class I Pictish Symbol Stones from left to right (i) the Aberlemno Stone (48), (ii) the Eagle Stone in Strathpeffer (143) and (iii) the Crawstane in Rhynie (39(i)). These stones depict (i) the snake, the double disc and Z-rod, the mirror and comb symbols (ii) the horseshoe and eagle symbols and (iii) the salmon and the kelpie Pictish symbols. The stones are generally between a metre and two metres tall.

The majority of the Class I Pictish stones have two symbols on just one megalith face but many have three symbols and two have just one symbol of a man. The mean number of figures is approximately 2.3 Pictish symbols per stone. The small number of symbols represented on each stone makes the idea of the symbols being similar to the hieroglyphs of Ancient Egypt, which can be read as a series of words through sounds associated with

each hieroglyph, extremely unlikely and poses the question as to what information could be conveyed by so few symbols. The Rosetta stone discovered in 1799 in Rosetta, Egypt was the stone that allowed the French philologist Jean Francois Champollion to finally decipher the Egyptian Hieroglyphs. This was made possible by the fact that this stone from the Ptolemaic era (196BC) was carved with three scripts; two in Egyptian, (one hieroglyphic and the other demotic) and the third in classical Greek, as translations of the same passage describing a tax amnesty for the temple priests. A Pictish version of the Rosetta Stone would likewise allow the symbols to be decoded but there is a problem in that although there are a few stones that have some Ogham script carved on them besides the Pictish symbols such as the Brandsbutt stone (5) the translation of the script "IRATADDOARENS" does not lead us very far and there is the possibility that the Ogham script may have been added to the stone later than the symbols and it is believed to refer to the Christian Saint Ethernan or Adrian* who lived some 300 years after the stone was carved.



Figure 3 Brandsbutt Stone showing Ogham script carved down the left hand side of the stone

The Pictish Stones

The distribution of the Class I Pictish stones is shown in Figure 4. The location and description of the symbols carved on each stone is outlined in Table 1.

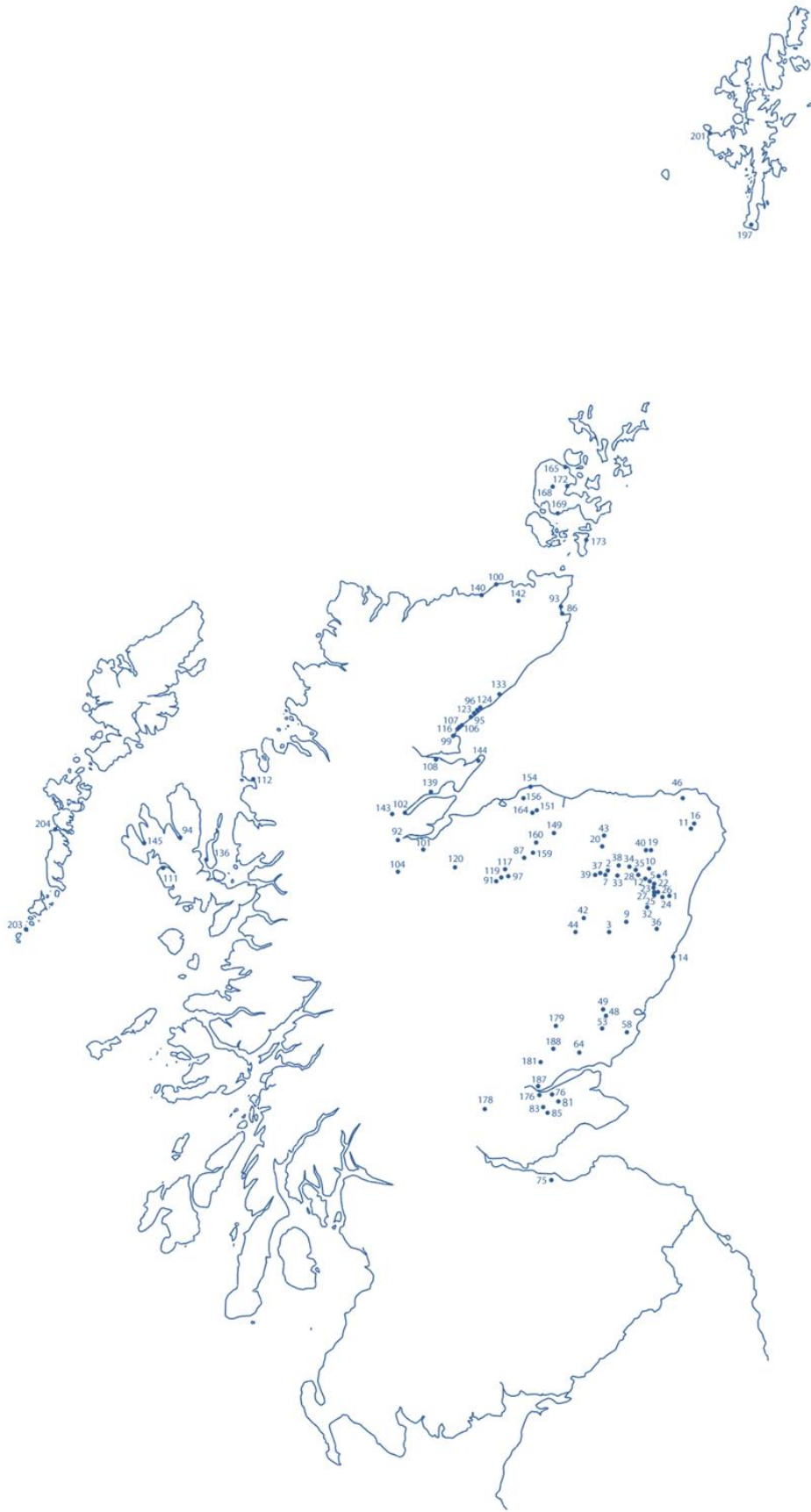


Figure 4 Map showing the location of the 120 Pictish stones referred to in this study.

Stone	Location	Grid Reference	Pictish Symbols
1	Dyce	NJ8752 1541	Kelpie, Double Disc and Z-Rod
2	Ardlair	NJ5547 2784	Kelpie, Tuningfork, Mirror
3	Birse	NO555 973	Mirror & Comb, Kelpie
4	Bourtie	NJ8045 2485	Crescent V-Rod, Double Disc and Z-Rod, Mirror&Comb
5	Brandsbutt	NJ7600 2240	Crescent V-Rod, Serpent & Z-Rod
7(i)	Clatt	NJ5389 2600	Triple Disc, Double Disc and Z-Rod, Mirror
7(iii)	Clatt	NJ5384 2598	Kelpie, Horseshoe
9	Craigmyle	NJ6402 0235	Notched Rectangle, Serpent
10	Daviot	NJ7595 2863	Crescent V-Rod , Mirror & Comb
11	Deer	NJ9685 4810	Rug, Crescent V-Rod
12	Drimmies	NJ7426 2350	Horseshoe, Ogee, Mirror & Comb
14	Dunnicaer	NO8821 8464	Double Disc and Z-Rod, Flower, Mirror & Comb
16	Fetterangus	NJ9814 5056	Triple Disc, Mirror Case
19(i)	Fyvie	NJ7684 3777	Crescent and V-Rod, Mirror, Kelpie
19(ii)	Fyvie	NJ7684 3777	Double Disc and Z-Rod, Eagle
20	Huntly	NJ5292 3999	Double Disc and Z-Rod, Horseshoe
22(i)	Inverurie	NJ7802 2062	Crescent and V-Rod, Mirror Case, Serpent and Z-Rod, Double Disc and Z-Rod
22(iii)	Inverurie	NJ7802 2062	Circle, Double Disc and Z-Rod
22(iv)	Inverurie	NJ7802 2062	Horse
23	Keith	NJ7799 2018	Double Disc and Z-Rod, Salmon, Mirror & Comb
24	Kinellar	NJ8214 1445	Circle, Crescent and V-Rod
25	Kintore	NJ790 162	Rug, Kelpie, Mirror
26(a)	Kintore	NJ7939 1634	Kelpie, Double Disc and Z-Rod
26(b)	Kintore	NJ7939 1634	Kelpie, Mirror
27(a)	Kintore	NJ7930 1628	Salmon, Triple Disc
27(b)	Kintore	NJ7930 1628	Crescent V-Rod, Kelpie
28(i)	Logie Elphinstone	NJ69 26	Crescent V-Rod, Double Disc and Z-Rod
28(ii)	Logie Elphinstone	NJ69 26	Crescent V-Rod, Double Disc and Z-Rod
28(iii)	Logie Elphinstone	NJ69 26	Kelpie, Crescent V-Rod
32	Nether Corskie	NJ7483 0960	Mirror, Mirror Case
33	Newbigging	NJ6055 2581	Rug, Dog, Mirror & Comb
34	Newton House	NJ6623 2972	Double Disc and Z-Rod, Serpent
35	Newton Lewesk	NJ693 279	Double Crescent, Mirror Case, Rug
36	Park House	NO794 984	Flower, Crescent V-Rod, Mirror & Comb
37	Percylieu	NJ521 265	Salmon, Horseshoe
38	Picardy	NJ6099 3026	Double Disc and Z-Rod, Serpent and Z-Rod, Mirror
39(i)	Rhynie	NJ4971 2634	Salmon, Kelpie
39(ii)	Rhynie	NJ4985 2702	Double Disc and Z-Rod
39(iii)	Rhynie	NJ4985 2702	Man
39(iv)	Rhynie	NJ4982 2700	Kelpie, Double Disc and Z-Rod, Mirror
39(v)	Rhynie	NJ4992 2649	Kelpie, Double Disc and Z-Rod, Mirror & Comb

Stone	Location	Grid Reference	Pictish Symbols
39(vi)	Rhynie	NJ4992 2649	Double Disc and Z-Rod, Crescent and V-Rod, Mirror
39(vii)	Rhynie	NJ4976 2636	Man
40	Rothiebrisbane	NJ7456 3783	Horseshoe, Circle
42	Tillypronie	NJ430 048	Notched Rectangle and Z-Rod, Crescent V-Rod
43(i)	Tillytarmont	NJ533 473	Goose, Mirror, Mirror Case
43(ii)	Tillytarmont	NJ533 473	Crescent V-Rod, Double Disc and Z-Rod
43(iii)	Tillytarmont	NJ533 473	Crescent V-Rod, Double Disc and Z-Rod,
43(iv)	Tillytarmont	NJ5331 4724	Eagle, Kelpie
43(v)	Tillytarmont	NJ5331 4716	Serpent and Z-Rod, Horseshoe, Mirror, Comb
44	Tullich	NO3905 9754	Double Disc and Z-Rod, Kelpie, Mirror
46	Tyrie	NJ9300 6311	Eagle, Notched Rectangle and Z-Rod
48	Aberlemno	NO5228 5591	Serpent, Double Disc and Z-Rod, Mirror, Comb
49	Aberlemno	NO524 556	Kelpie, Horseshoe
53	Dunnichen	NO516 496	Flower, Double Disc and Z-Rod, Mirror, Comb
58	Kinblethmont	NO6380 4733	Crescent V-Rod, Kelpie, Mirror, Comb
64	Strathmartine	NO374 361	Crescent V-Rod, Kelpie
75	Edinburgh	NT250 736	Crescent V-Rod, Double Disc and Z-Rod
76	Abdie	NO262 169	Triple Disc, Crescent V-Rod, Mirror
81	Newton of Collessie	NO2927 1324	Man
83	Strathmiglo	NO2167 1022	Tuningfork, Deer Head
85	Westfield	NO2384 0732	Mirror Case, Double Disc and Z-Rod
86	Ackergill	ND3483 5499	Salmon, Rug, Horseshoe, Notched Rectangle
87	Advie	NJ142 353	Crescent V-Rod, Mirror Case
91	Ballintomb	NJ00 24	Crescent V-Rod, Notched Rectangle
92	Beauly	NH5101 4528	Triple Oval, Crescent V-Rod
93	Birkle Hill	ND3392 5847	Triple Disc, Triple Oval
94	Clach Ard	NG4210 4908	Crescent V-Rod, Double Disc and Z-Rod, Mirror, Comb
95(i)	Clynekirkton	NC89 06	Crescent V-Rod, Rug
95(ii)	Clynekirkton	NC89 06	Rug, Crescent V-Rod, Mirror
96(i)	Clynemilton	NC914 069	Horseshoe, Crescent V-Rod, Mirror
96(ii)	Clynemilton	NC914 069	Notched Rectangle and Z-Rod, Mirror, Comb
97	Congash	NJ0580 2622	Horseshoe, Kelpie
99	Craigton	NH799 987	Notched rectangle, Crescent V-Rod, Flower
100	Crosskirk	ND0248 7012	Crescent V-Rod, Horseshoe
101	Cullaird	NH6341 4041	Mirror, Comb, Horseshoe, Rug and Z-Rod
102a	Dingwall	NH5493 5893	Double Disc and Z-Rod, Crescent V-Rod, Crescent V-Rod
102b	Dingwall	NH5493 5893	Three Circles, Crescent V-Rod
104(i)	Drumbuie	NH51 30	Serpent and Z-Rod, Double Disc and Z-Rod
104(ii)	Drumbuie	NH51 30	Salmon, Mirror Case, Mirror, Comb
106	Dunrobin	NC8494 0057	Salmon, Tuningfork, Mirror, Comb

Stone	Location	Grid Reference	Pictish Symbols
107	Dunrobin	NC8470 0039	Double Crescent, Serpent and Z-rod, Mirror, Comb
108	Edderton	NH7082 8507	Salmon, Double Disc and Z-Rod
111	Fiscavaig	NG33 34	Double Disc and Z-Rod, Crescent V-Rod
112	Gairloch	NG799 772	Goose, Salmon
116	Golspie	NC8338 0018	Crescent V-Rod, Kelpie, Mirror, Comb
117	Grantown	NJ0452 3012	Deer, Rug
119	Inverallan	NJ0266 2602	Crescent V-Rod, Notched Rectangle and Z-Rod
120	Invereen	NH7968 3108	Crescent V-Rod, Double Disc and Z-Rod
123(ii)	Kintradwell	NC9316 0838	Crescent V-Rod, Mirror, Comb
124	Kintradwell	NC9283 0806	Ogee, Mirror Case
133	Navidale	ND0419 1615	Triple Disc, Kelpie
136	Raasay	NG5467 3677	Tuningfork, Crescent V-Rod
139	Roskeen	NH6810 6902	Crescent, Pincers/Tuningfork
140	Sandside	NC9522 6518	Triple Oval, Mirror Case, Mirror, Comb
142	Skinnet	ND1309 6205	Triple Oval, Crescent V-Rod
143	Strathpeffer	NH4845 5852	Horseshoe, Eagle
144	Tarbat	NH9151 8402	Crescent V-Rod, Tuningfork, Serpent and Z-Rod
145	Tobar na Maor	NG2408 4648	Crescent V-Rod, Circle
149	Arndilly	NJ2905 4711	Notched Rectangle and Z-Rod, Mirror Case
151	Birnie	NJ2063 5872	Eagle, Notched Rectangle
154(i)	Covesea	NJ1750 7072	Salmon, Crescent V-Rod
154(ii)	Covesea	NJ1750 7072	Triple Oval, Flower
156a	Easterton of Roseisle	NJ144 647	Crescent V-Rod, Mirror, Comb
156b	Easterton of Roseisle	NJ144 647	Goose, Salmon
159(i)	Inveravon	NJ1828 3757	Mirror Case, Eagle, Mirror, Comb
159(ii)	Inveravon	NJ1828 3757	Crescent V-Rod, Triple Disc, Mirror, Comb
159(iv)	Inveravon	NJ1828 3757	Crescent V-Rod, Kelpie
160	Knockando	NJ2026 4218	Serpent, Mirror
164	Upper Manbean	NJ1868 5761	Kelpie, Mirror, Comb
165	Gurness	HY3818 2685	Rug, Tuningfork, Mirror Case
168	Knowe of Burrian	HY3082 1680	Eagle, Crescent V-Rod, Mirror
169	Orphir	HY33 04	Crescent V-Rod, Rug
172	Redland	HY378 171	Rug, Crescent V-Rod
173a	South Ronaldsay	ND4707 9084	Crescent V-Rod, Mirror Case

Stone	Location	Grid Reference	Pictish Symbols
173b	South Ronaldsay	ND4707 9084	Crescent V-Rod, Rug
176	Abernethy	NO1899 1638	Tuningfork, Crescent V-Rod
178	Blackford	NN9243 0980	Goose, Rug
179	Bruceton	NO2898 5039	Horseshoe, Kelpie
181	Collace	NO2069 3319	Kelpie, Mirror, Comb, Rug
187a	Inchyra	NO1904 2120	Tuningfork, Mirror, Salmon, Double Disc
187b	Inchyra	NO1904 2120	Salmon, Serpent
188	Keillor	NO2733 3976	Dog, Double Disc and Z-Rod, Mirror
197	Breck of Hillwell	HU372 146	Crescent V-Rod, Rug
201	Sandness	HU1912 5765	Rug, Horseshoe, Mirror
203	Pabbay	NL6072 8745	Crescent V-Rod, Flower
204	Benbecula	NF803 566	Rug, Circle

Table 1 Pictish Symbol Stones used in the analysis together with their location and the symbols carved on each stone

The Meaning of the Pictish Symbols

The Pictish Rosetta Stone

In the absence of a stone that is carved with both the Pictish symbols and a known ancient language depicting the same message as the symbols, we are left to examine the symbols themselves to try and discover the meaning of each individual symbol and possible associations between groups of symbols to decipher their code. However, as there are over 24 Pictish Symbols and only two or three of the symbols that are usually depicted on any stone face, the determination of any general relationship between the symbols is hard to imagine but the fact that many different pairs of the twenty-four symbols have been used suggests it is likely that there is some general relationship between all the symbols. One avenue of exploration was to find a stone that had more than the usual number of symbols and although none of the known Class I stones had more than four symbols depicted on a stone face, the Golspie Stone (116), a Class II stone, has nine Pictish symbols carved on one side and a Pictish Cross on the other. The stone was later reused as a grave stone and an inscription describing the deceased was later carved around the edge of the Pictish Cross face of the stone.

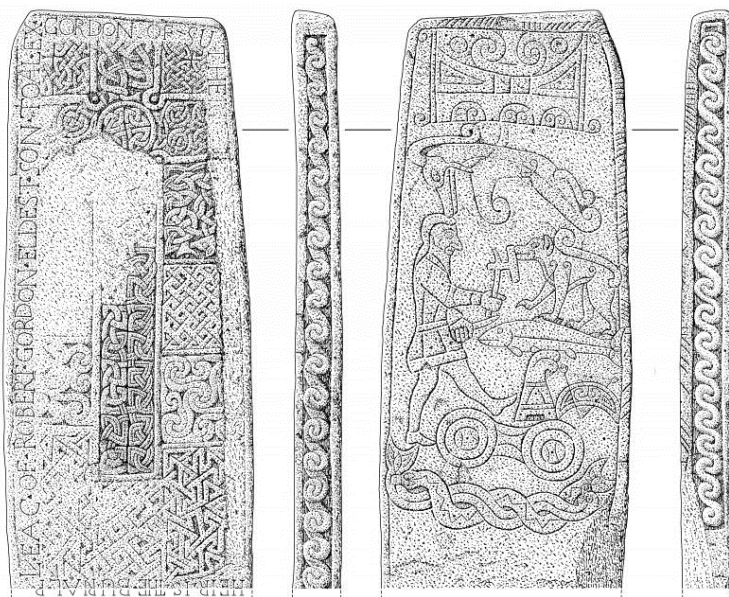


Figure 5 The Golspie Class II Pictish Symbol Stone

The nine symbols carved on the Golspie stone are the Rug, the Beast, the Man, the Dog, the Salmon, the Flower, the Crescent and V-Rod, the Double Disc and Entwined Serpents. Eight of the Nine symbols are common to the Class I Pictish symbol stones and interestingly although this stone is classified as a Class II stone the carving of these symbols is not carried out in relief, typical of the Class II Pictish stones, but in the same incised outline manner as the Class I Pictish stones. As the symbols appear together the question arises as to whether these symbols are related in some way.

The possible identification of the symbols becomes immediately apparent when the pattern of stars in the night sky is observed where the rectangular constellation of Gemini can be seen above the mythical Beast, known as the Unicorn represented as the constellation Monoceros, which lies close to the constellation of Orion, the Man besides Canis Major and Canis Minor the Dog constellations and the constellation of Pisces represented perhaps as the Salmon symbol. The Flower symbol may represent the constellation of Aquarius that lies besides Pisces as its symbol shares a close similarity of shape to the arrangement of stars in this constellation. Cetus the whale appears as two connected discs when the stars are joined in the same manner as the Pictish symbol described as the Double Disc. Finally below Cetus lies the constellation of Eridanus which shares some similarity of form with the symbol of the entwined serpents.

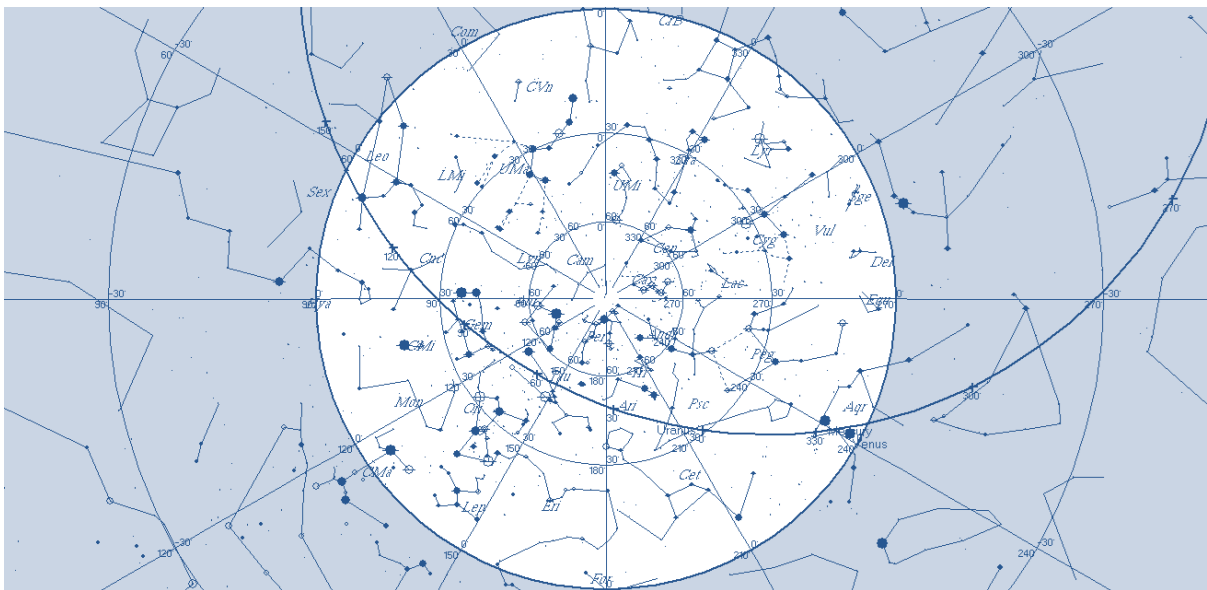


Figure 6 Map of the night sky, as appears when looking directly upwards with South at the bottom showing, from East to West, the constellations of Gemini, Monoceros, Orion, Canis Major and Canis Minor, Cetus, Pisces and Aquarius lying together in close proximity within 150 degrees of arc, constellations that share a similarity of appearance and identification with the symbols carved on the Golspie stone.

Each of the Pictish symbols can be compared in turn with the pattern of stars in the constellations to see whether they share a common shape or a similar identity.

The Constellations associated with the Pictish Symbols

The symbols depicted on the Golspie stone and the pattern of stars in the constellations appear to share a similarity of form and/or a similarity in the way the Pictish symbol and the constellation today is still identified.

Golspie Symbol	Identification based on Pattern of Stars	Identification based on Name of Constellation
Rug	Gemini Rectangular arrangement of stars	Possibility that Castor and Pollux are indicated by two dotted circles carved in the stone
Beast		Monoceros The Beast identified as a Kelpie or water horse is a mythological horse like the Unicorn
Man	The Man symbol holds an axe in front of him that shares a similar appearance to the stars in Orion	Orion Orion is identified as the Hunter
Dog		Canis Major and Canis Minor are identified as Dogs
Salmon		Pisces is identified as a Fish or Fishes
Flower	Aquarius Pattern of stars resembles the Pictish Flower symbol	
Double Disc	Cetus Pattern of stars appears as a double disc	

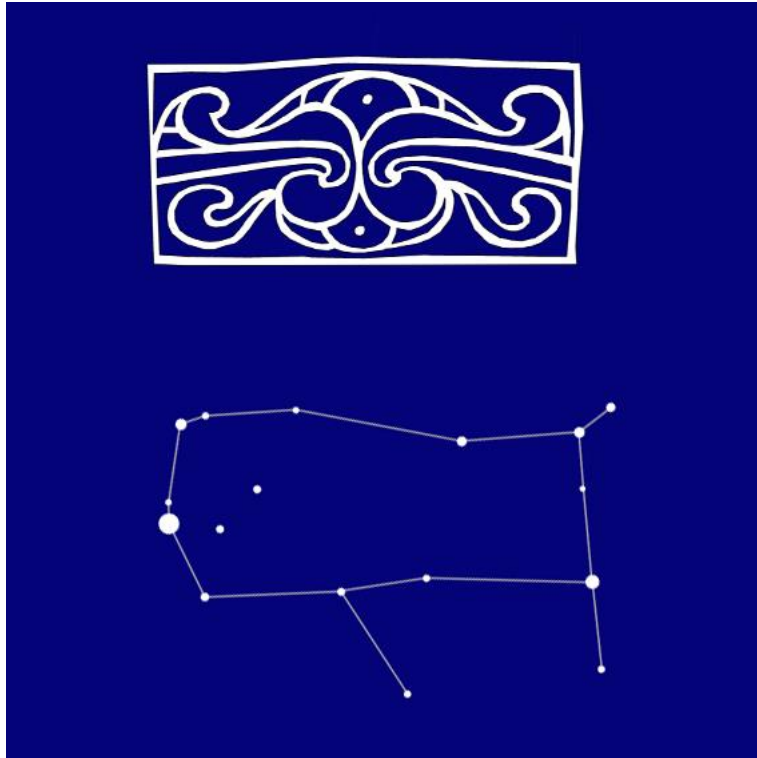


Figure 7 Pictish symbol described as a Rug or Shield and the constellation of Gemini

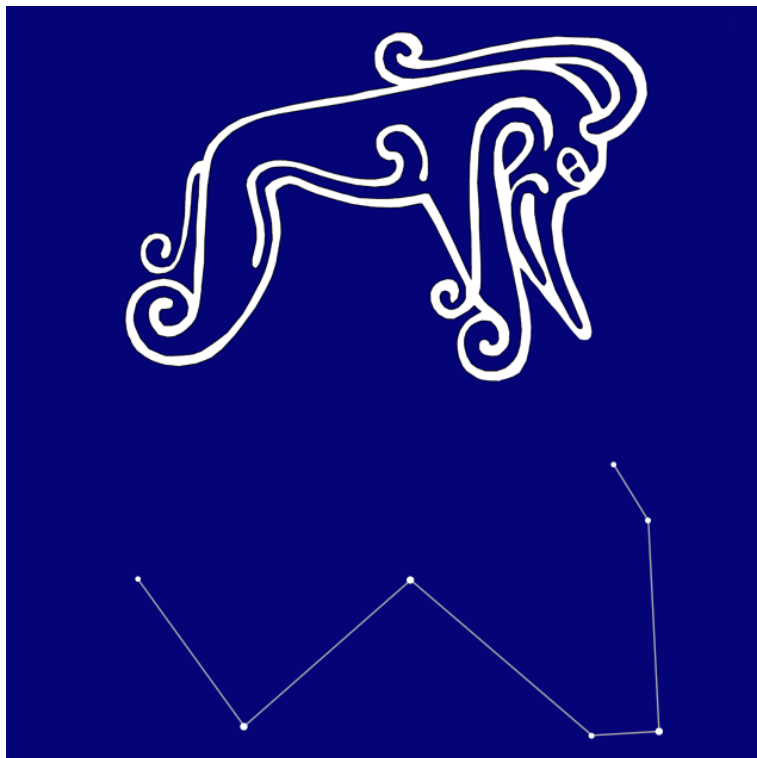


Figure 8 Pictish Beast Symbol and the constellation of Monoceros (the Unicorn)

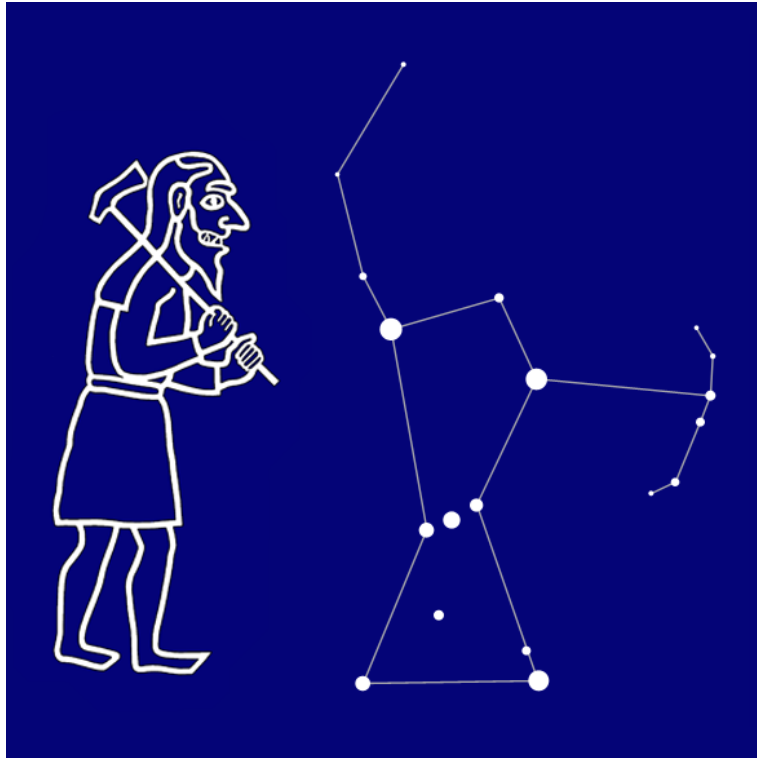


Figure 9 The Pictish Man symbol and the constellation of Orion

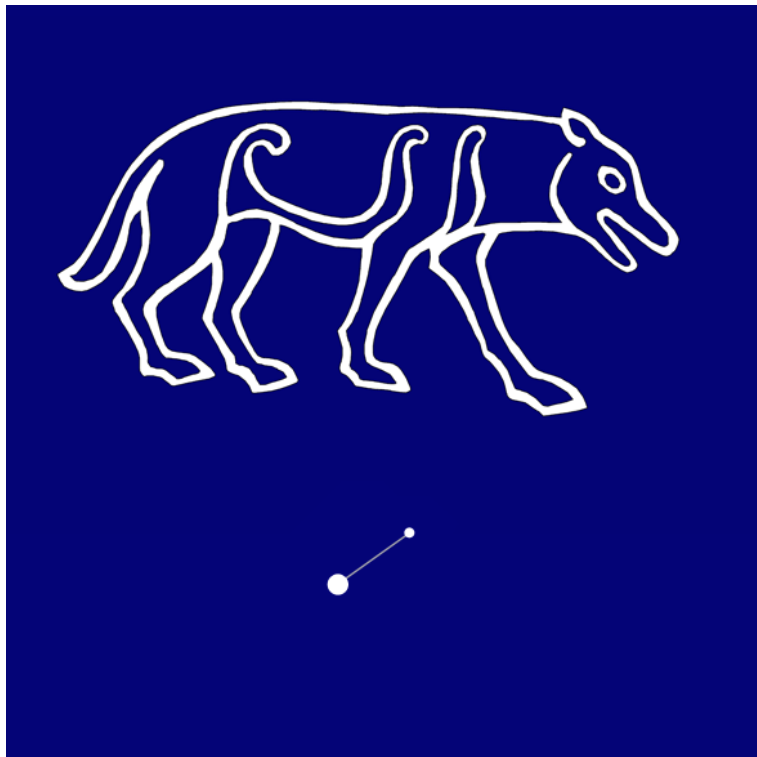


Figure 10 The Pictish Dog symbol and the constellation of Canis Minor

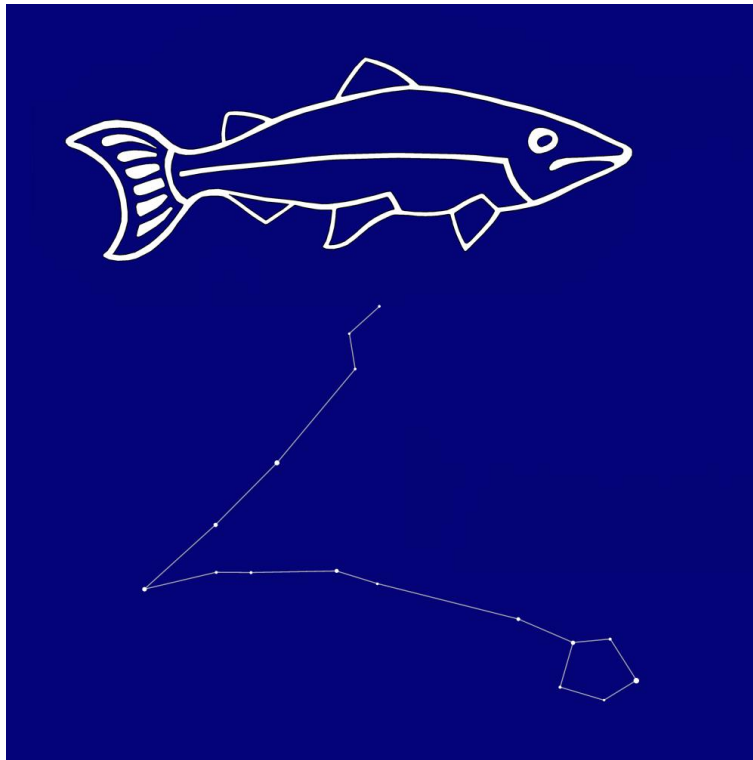


Figure 11 The Pictish Salmon symbol and the constellation of Pisces

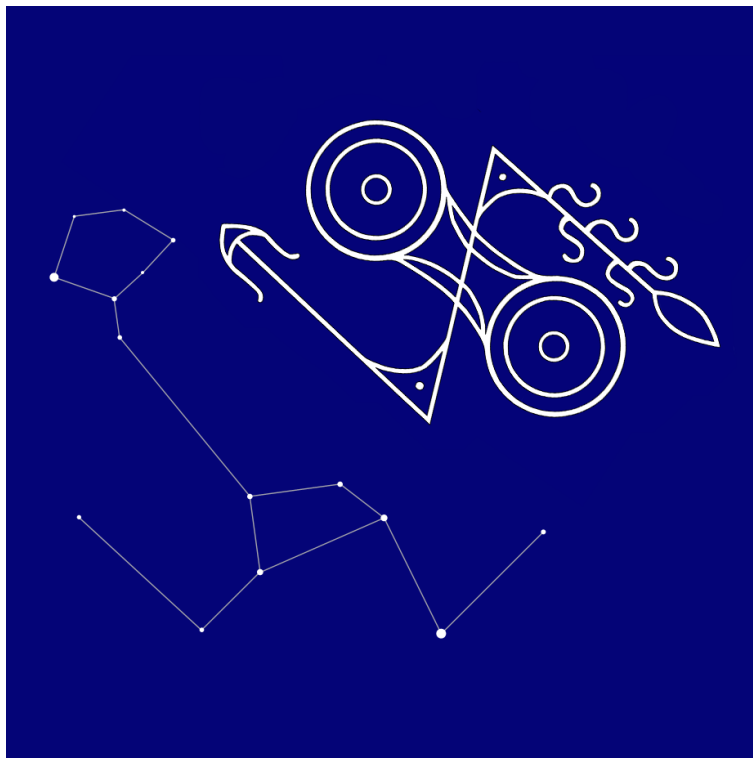


Figure 12 The Pictish symbol of the Double Disc and Z-Rod and the constellation of Cetus

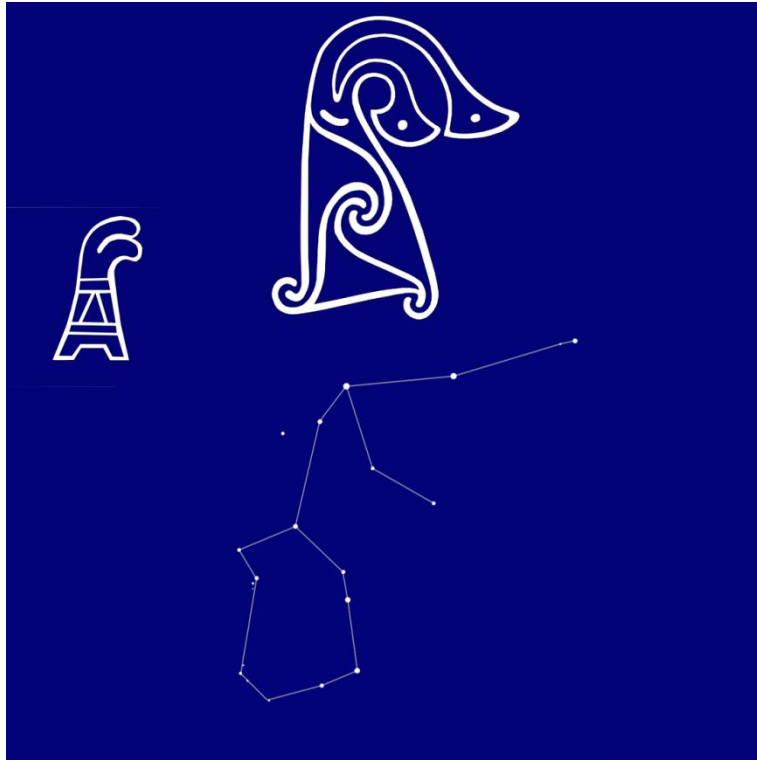


Figure 13 The Pictish Flower symbol as represented on the Golspie Class II stone (top left) and as represented on the earlier Class I Pictish Symbol stones (top centre) and below the constellation of Aquarius

The identification of the other symbols can likewise be proposed using the same process.

Golspie Symbol	Identification based on Pattern of Stars	Identification based on Name of Constellation
Tuningfork	Taurus	
Bull		Taurus
Mirror	Virgo	Possible association of Mirror with a Goddess
Horseshoe	Lyra	
Eagle		Aquila
Snake	Draco	Draco
Triple Disc	Sagittarius	
Goose	Cygnus	Cygnus Swan or Goose
Horse		Pegasus
Notched Rectangle	Vela?	
Comb	Coma Berenices (Spine of Comb)	Coma Berenices
Mirror Case	Cetus (Westfield Falkland (85))	
Deer	Auriga?	
Crescent and V-Rod	Ursa Minor	
Bear		Ursa Major

Table 3

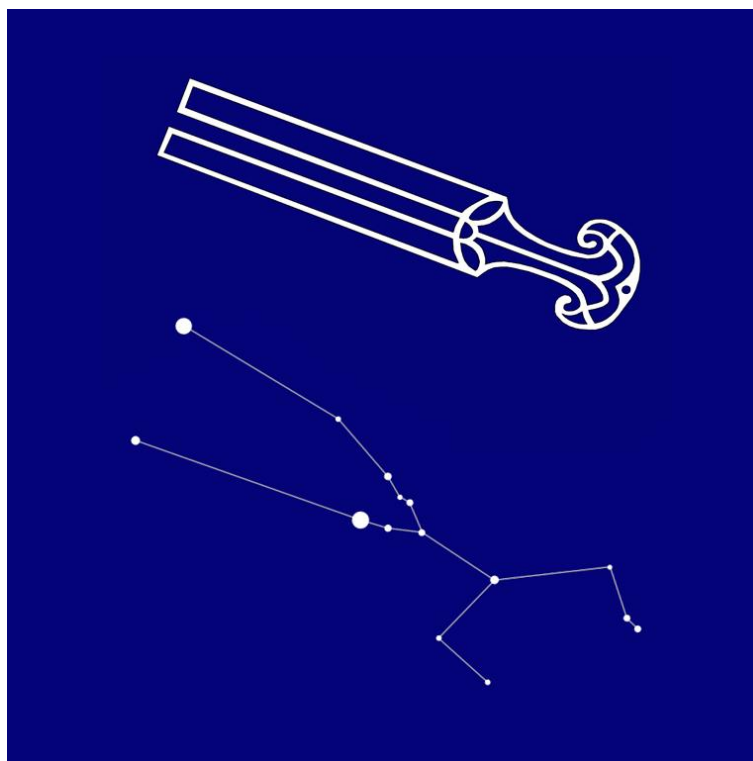


Figure 14(i) The Pictish Tuningfork symbol and the constellation of Taurus

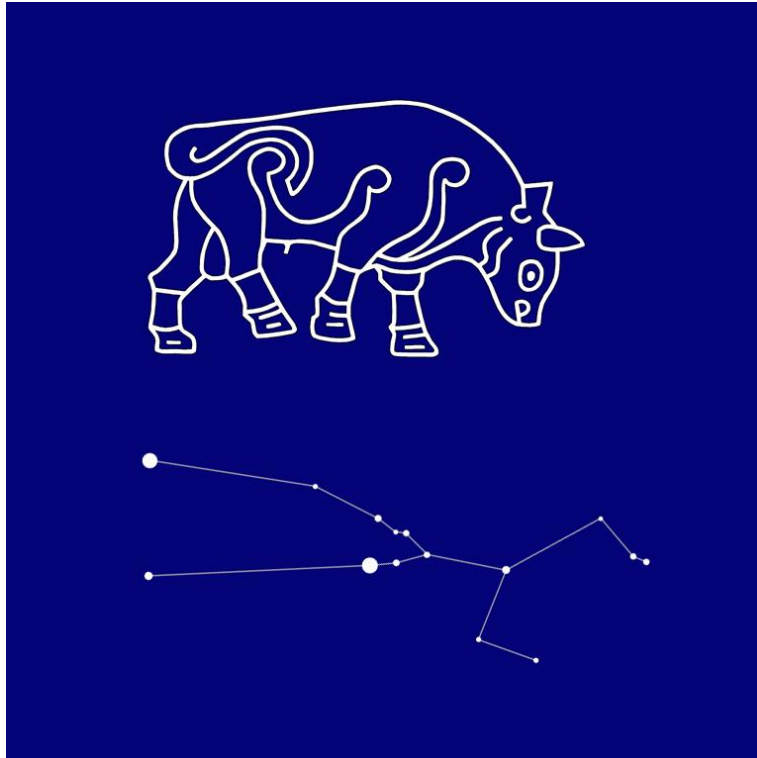


Figure 14(ii) The alternative Pictish Bull symbol associated with the constellation of Taurus, the bull.

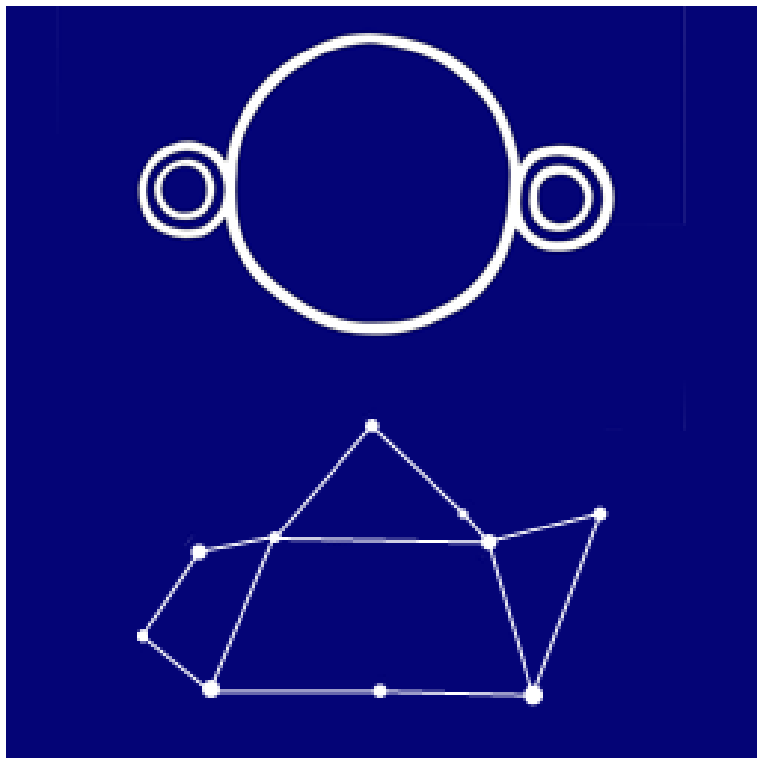


Figure 15 Pictish Triple Disc symbol and constellation of Sagittarius

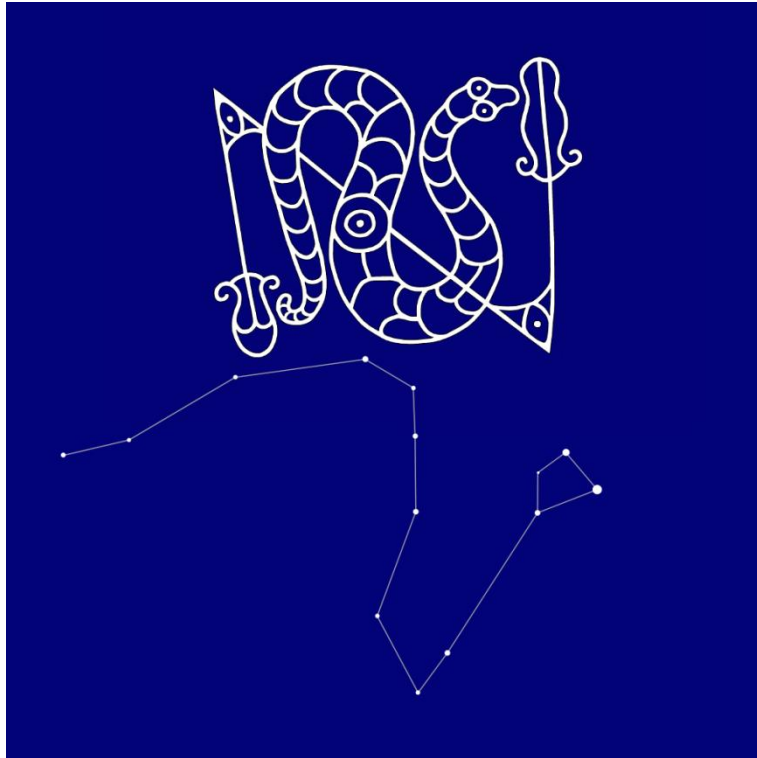


Figure 16 Pictish Snake symbol (together with the Z-Rod) and the constellation Draco

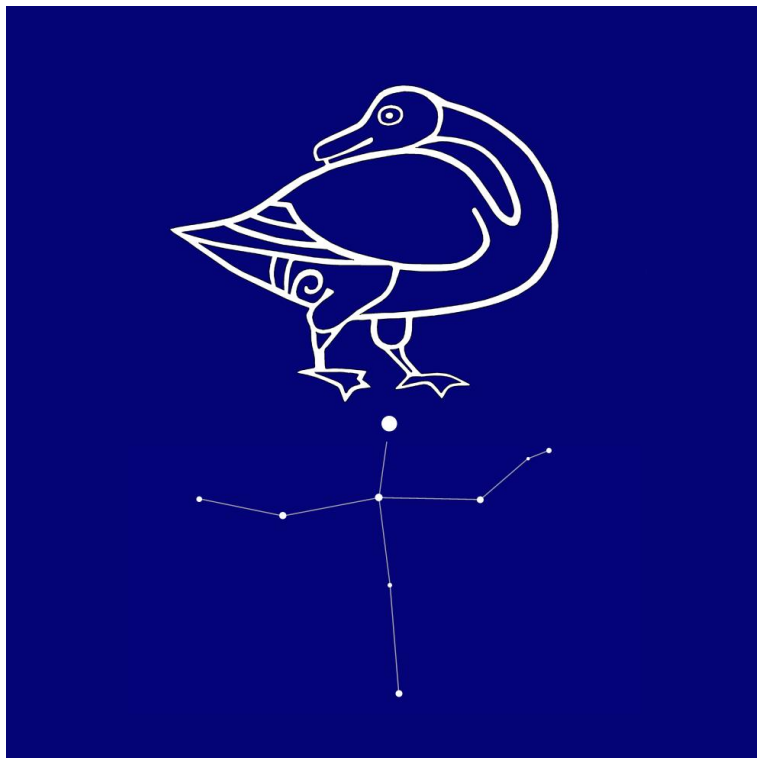


Figure 17 The Pictish Goose symbol and the constellation of Cygnus which today is identified as a swan.

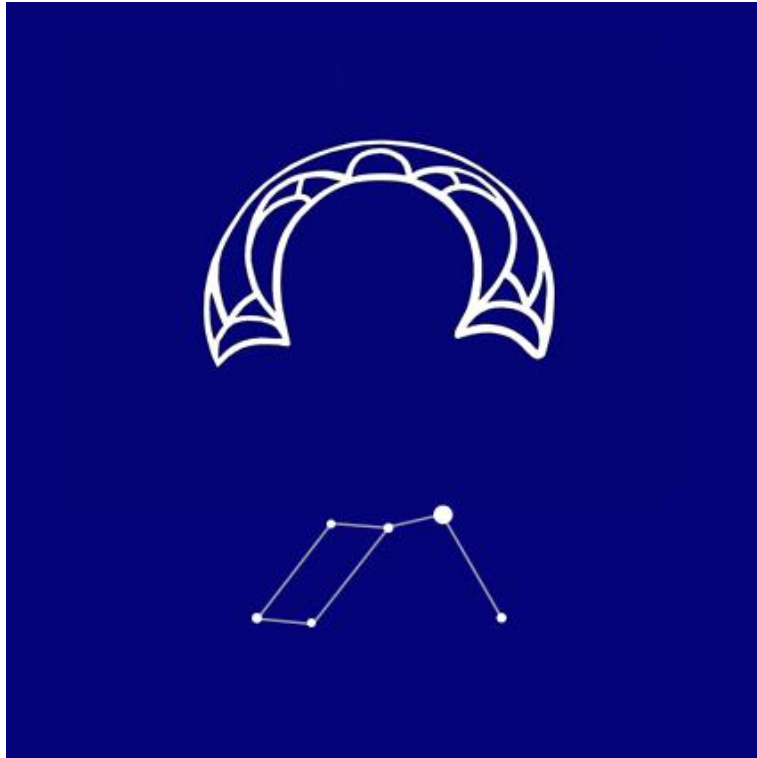


Figure 18 The Pictish Horseshoe symbol and the constellation of Lyra

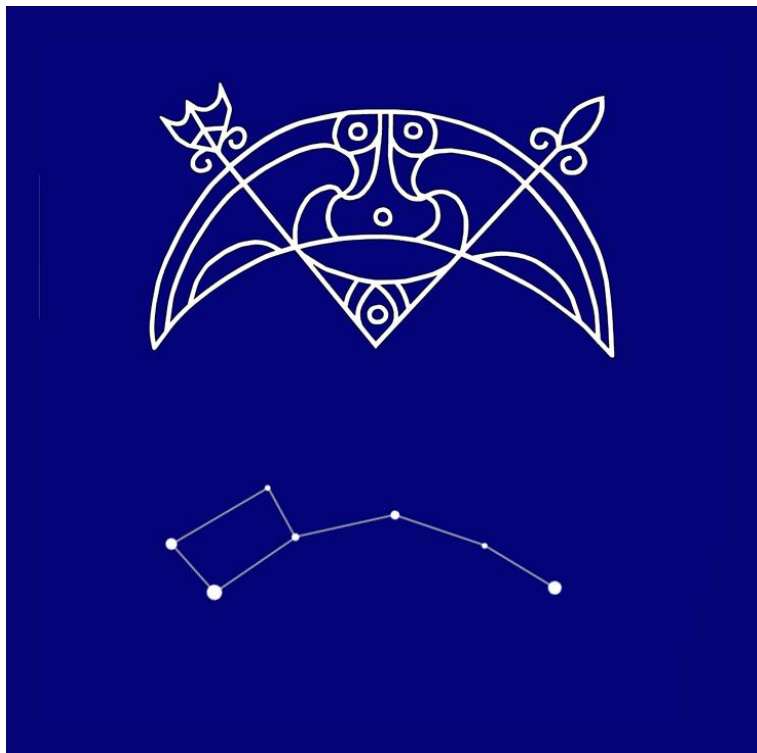


Figure 19 The Pictish Crescent and V-Rod symbol and constellation Ursa Minor

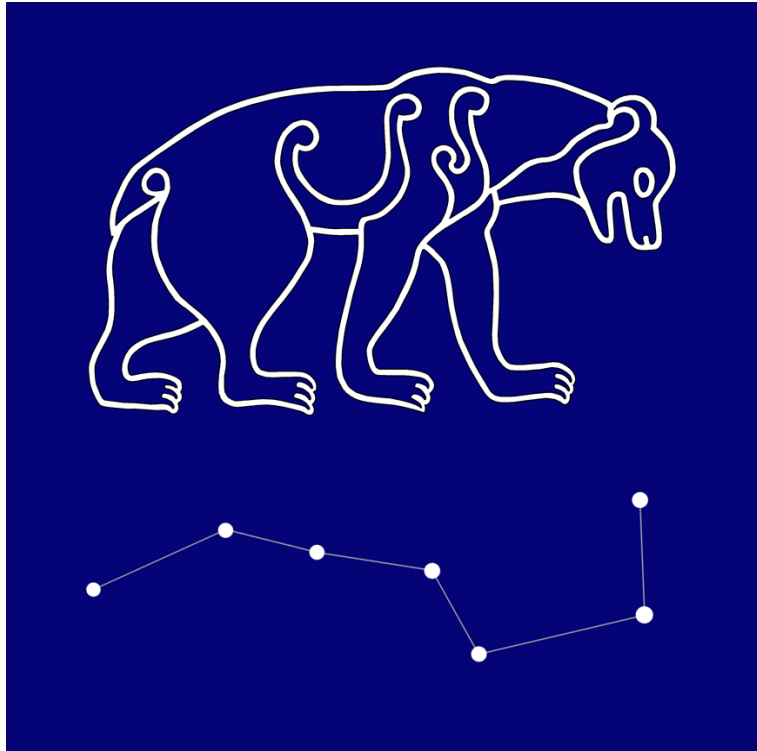


Figure 20 The Pictish Bear symbol and the constellation of Ursa Major

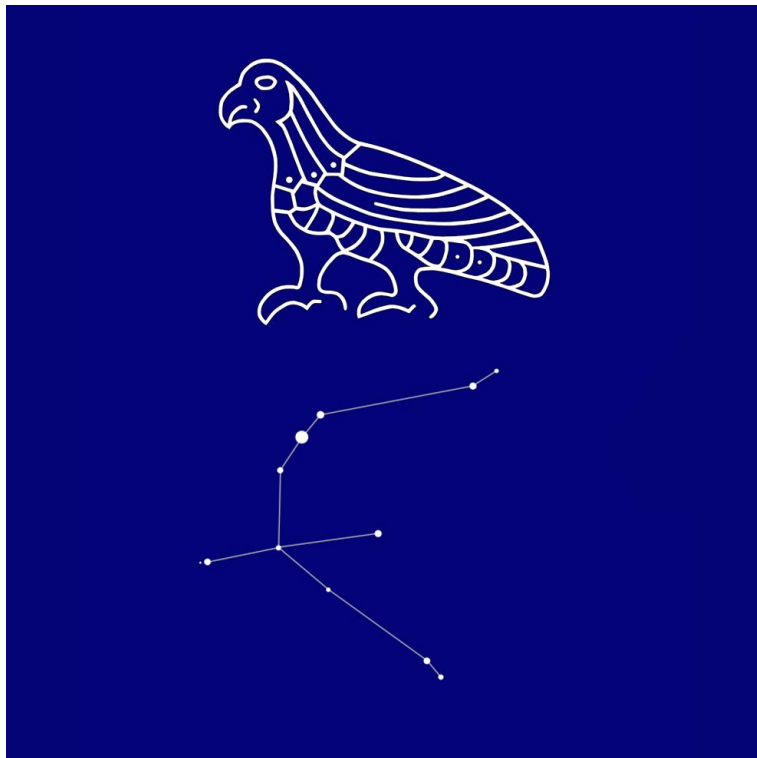


Figure 21 The Pictish Eagle symbol and the constellation of Aquila. (Note pattern of five white dots in the Pictish symbol compared with the arrangement of the upper five stars in Aquila)

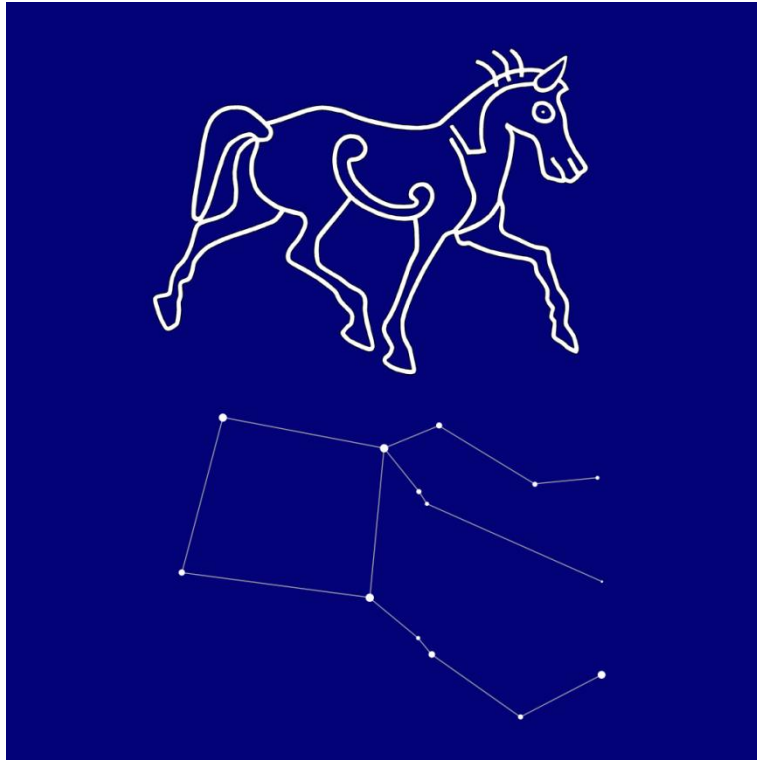


Figure 22 The Pictish Horse symbol and the constellation Pegasus.(There is a square shaped space created by the nearside front and rear leg of the horse symbol that may have been meant to reflect the "Square of Pegasus" arrangement of stars in the constellation)

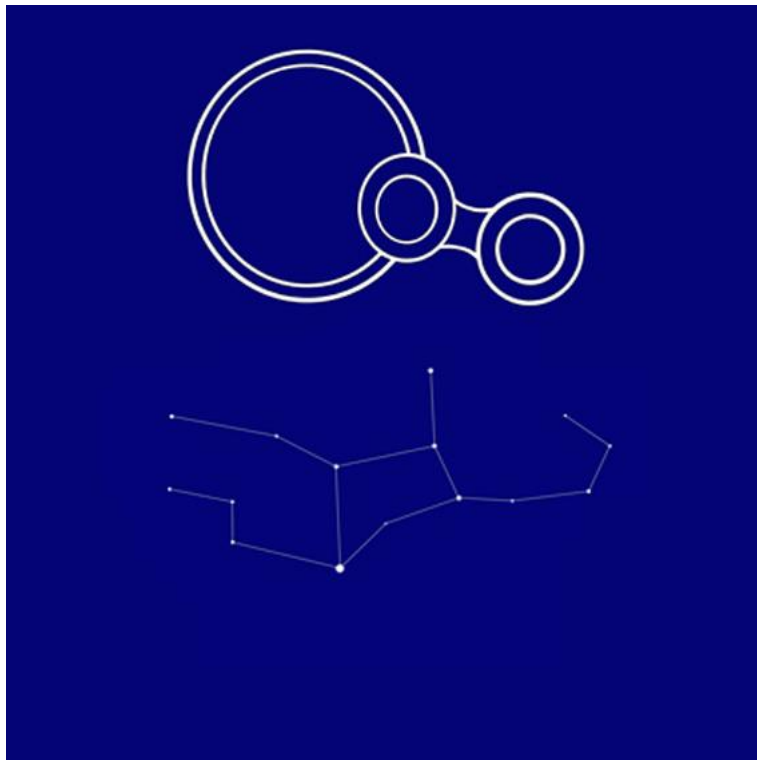


Figure 23 The Pictish Mirror symbol and the constellation Virgo

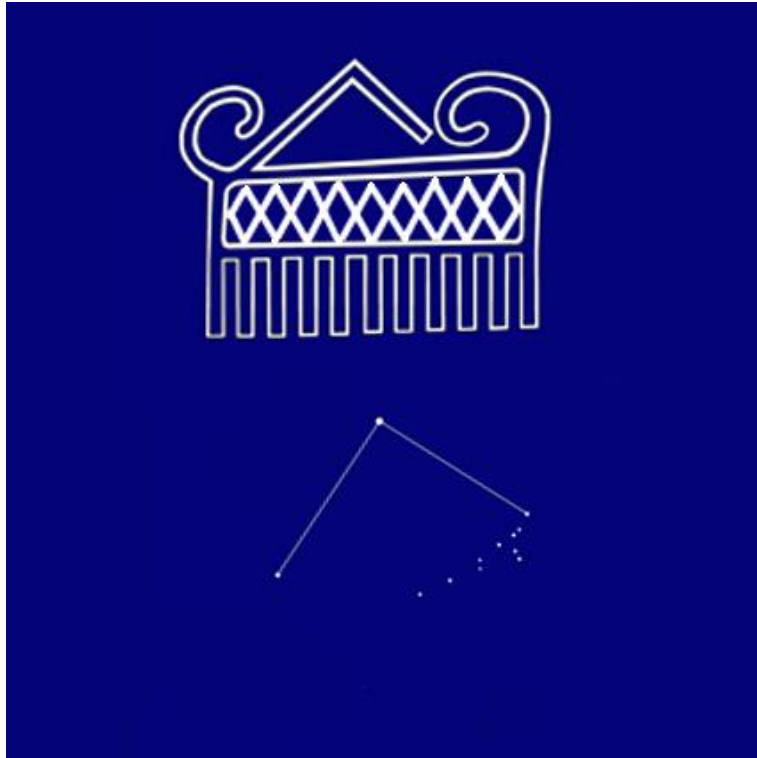


Figure 24 The Pictish Comb symbol and the constellation Coma Berenices. (Note Right angle decoration of comb's spine that mirrors the pattern of stars and also the cluster of nine stars in Coma Berenices (MEL 111)) perhaps represented as nine diamond lozenges on the spine of the comb.)

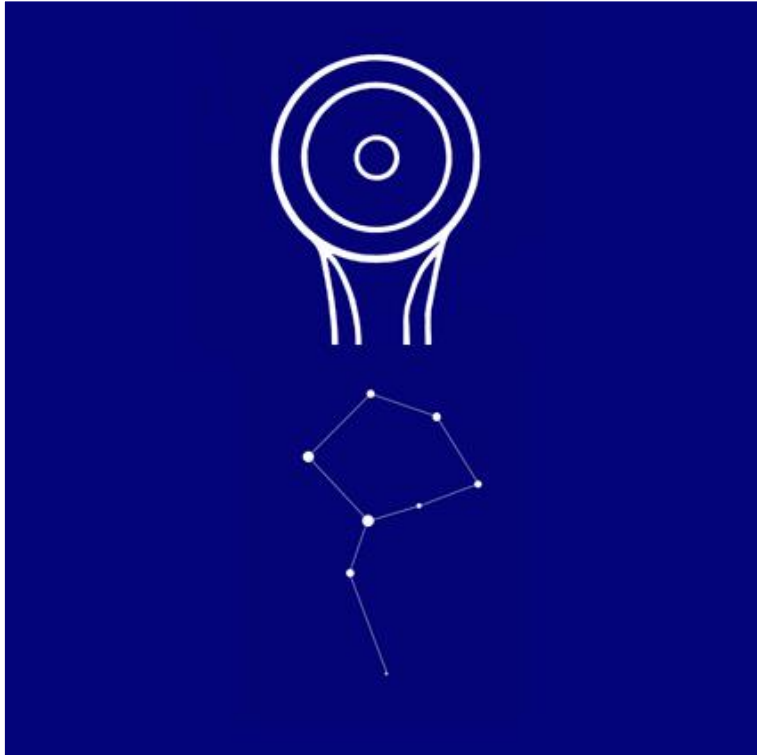


Figure 25 The Pictish Mirror Case symbol and part of the constellation Cetus (both The Double disc and the Mirror-case are carved in the same style on the Westfield stone from Falkland (85) and appear to be related to the same constellation of Cetus)



Westfield Falkland Stone (85) showing both the Double Disc and the Mirrorcase symbols in the same style suggesting that they are related to each other and that the Mirrorcase may be half the Double Disc.

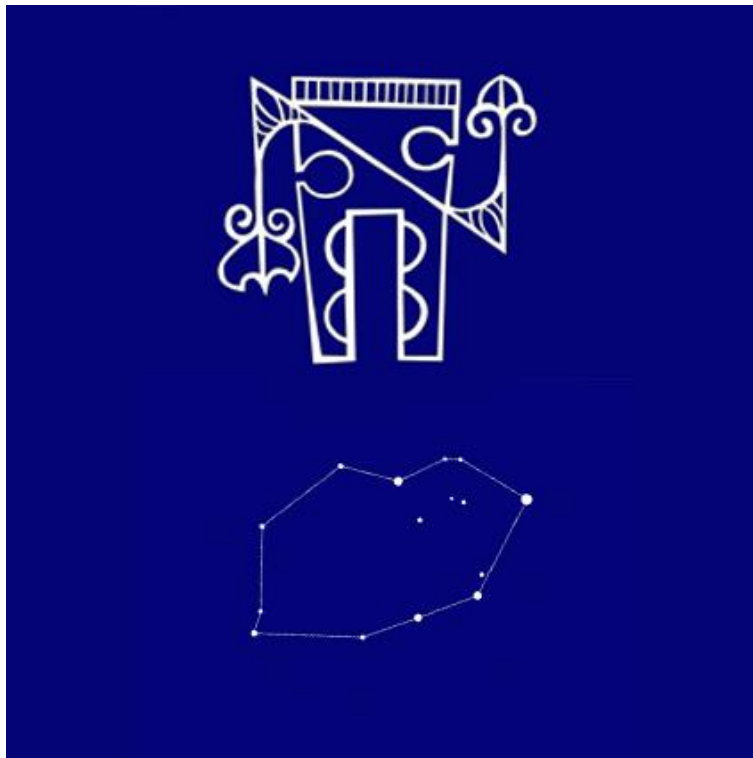


Figure 26 The Notched Rectangle symbol may represent the constellation of Vela

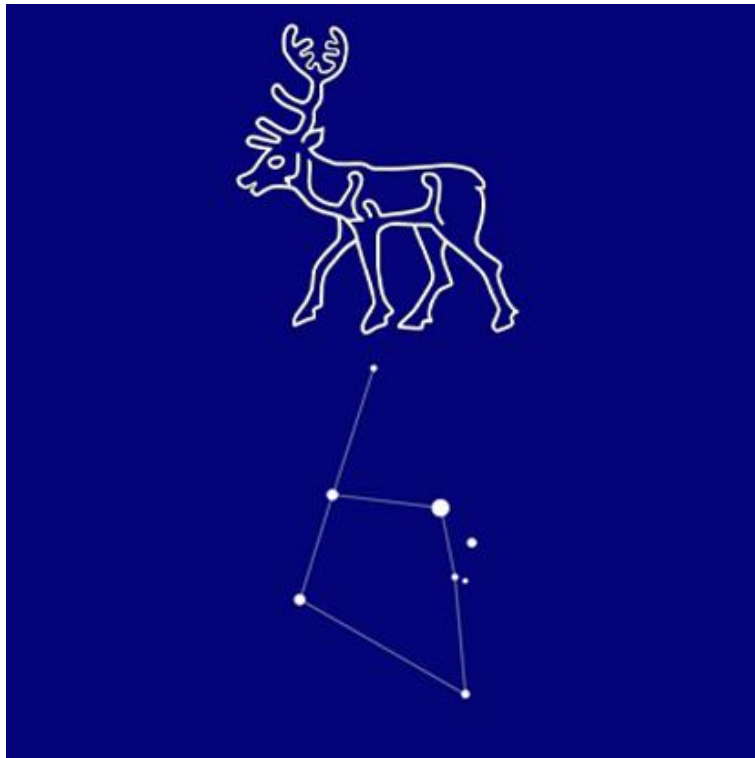


Figure 27 The Pictish Deer symbol and the constellation Auriga

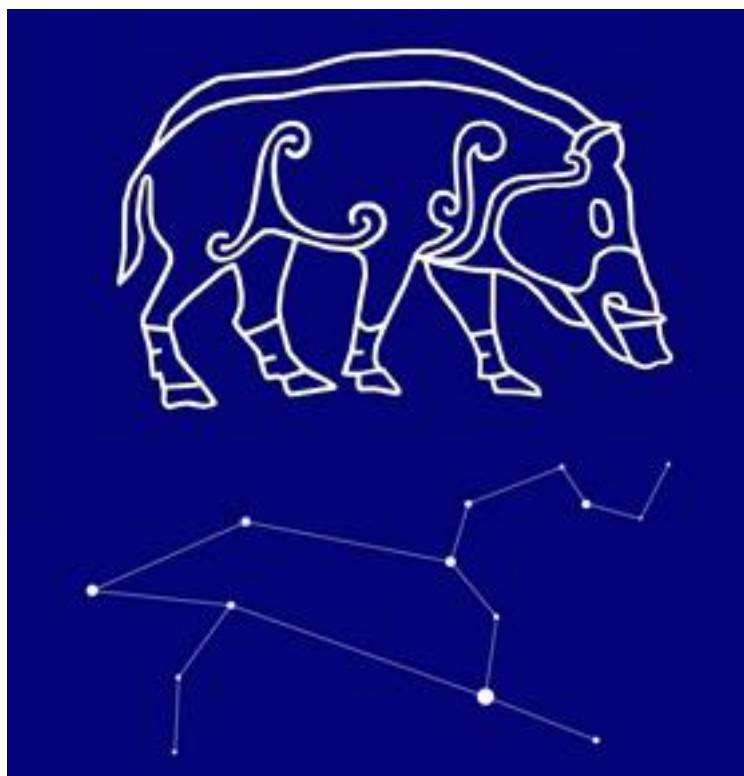


Figure 28 Pictish Boar Symbol and the constellation of Leo

The pattern of stars at the head of the constellation of Leo shares a similarity of form with a boar's tusk

Appearance of Constellations and Pictish Symbols

There is a very strong similarity of shape shared by certain constellations and the design of the Pictish symbols especially when considering the symbols are otherwise inexplicable in terms of representing known items or animals. Today's accepted patterns of the constellations when their brightest stars are joined by imaginary lines for the constellations Lyra, Sagittarius, Taurus, Gemini, Cetus and Aquarius are remarkably similar to the Pictish symbols known as the Horseshoe, the Triple Disc, the Tuningfork, the Rug, the Double Disc and the Flower. Other Pictish symbols the Man, the Salmon, the Goose, the Serpent, the Horse, the Bear, the Eagle and the Dog share a common physical association with the constellations Orion, Pisces, Cygnus, Draco, Pegasus, Ursa Major, Aquila, Canis Major or Minor. This accounts for nearly 60% of the symbols and when the similarity of features of Coma Berenices with the Comb symbol, Virgo with the Mirror, Monoceros with the Kelpie, Leo with the Boar symbol, Cetus with the Mirror-case, Andromeda with the Triple Oval and Taurus with the Bull symbol as an alternative to the Tuning-fork are included, 21 of the 24 symbols share either a similarity of shape and, or a similar physical association with major constellations which may occur by design or by chance.

It is interesting that a constellation identified with a man or an eagle or a fish or a dog for instance some 5000 years ago should still today be identified with the same animals. However it is perhaps understandable that unless there is a good reason to change the association then the ancient identification would carry on throughout the millennia. Only in cases like Leo, identified globally today as a lion can we understand that in countries like Scotland where no lions existed that the constellation could have been associated with another fearsome local animal, in this case a boar.

The proposed identification of the 24 Pictish symbols is summarised in the following table.

Symbol	Proposed Identification
Mirror	Virgo
Comb	Coma Berenices
Man	Orion
Salmon	Pisces
Goose	Cygnus
Snake	Draco
Bull	Taurus
Tuning fork	Taurus
Rug	Gemini
Beast or Kelpie	Monoceros
Double Disc	Cetus
Notched Rectangle	Vela
Flower	Aquarius
Triple Disc	Sagittarius
Triple Oval	Andromeda
Horse	Pegasus
Bear	Ursa Major
Boar	Leo
Eagle	Aquila
Dog	Canis Minor
Deer	Auriga
Crescent and V-Rod	Ursa Minor
Mirror Case	Cetus (half)
Horse shoe	Lyra

Table 4.

Purpose of the Pictish Symbol Stones

The megaliths carved with the Class I Pictish symbols may represent the star groups we identify today as the constellations but the significance of the constellations to the Picts and the reason for carving them on stones can only be guessed at. It may be that these constellations in pre-Christian times represented a pantheon of stellar deities that were important to the Picts and formed the basis of their belief system and calendar and this latter possibility opens up a new avenue for further analysis. The stones may have been carved by the Picts as votive offerings to their star gods and related to important festival days when these constellations and their brightest stars occupied an important position in the night sky. In order to examine the position of the stars and the constellations in the night sky, the date when the Class I Pictish symbols were carved is needed as the position of the stars change when viewed from Earth as a function of date due to the effect known

as precession of the equinoxes which results from the slight wobble that the Earth experiences as it rotates about its axis.

Dating the early Class I Pictish Symbol Stones

The problem with dating carved stones is that there is as yet no tried and tested scientific way of accurately determining when the rocks were carved. The megalith rock is millions of years old and there is perhaps a possibility that in the future, techniques will be developed that will allow the date of carving the stones to be established by perhaps carrying out isotopic analysis that can differentiate between the raw natural stone surface and the relatively newly exposed carved surfaces revealing the difference in these surfaces to exposure to atmospheric rays and the effect of this exposure to the near surface isotopic composition of the material. Today all that we have as dating tools are artefacts associated with the megaliths such as organic material found in close proximity to the stones which can be carbon dated and stylistic references to other known dated art. These two associations have high levels of uncertainty associated with them due to the possibility that the deposition of organic matter may not be contemporaneous with the erection of the megaliths and similarly that the artistic style of the monks painted images was influenced by symbols originating from a much earlier time, but in the absence of other evidence they are currently all we have to estimate the date when the stones were carved. The recent dating of a Pictish site on a sea stack off the Aberdeen coast has pushed back the date for the Pictish Class I stones to 300-400AD some three hundred years earlier than previously accepted.

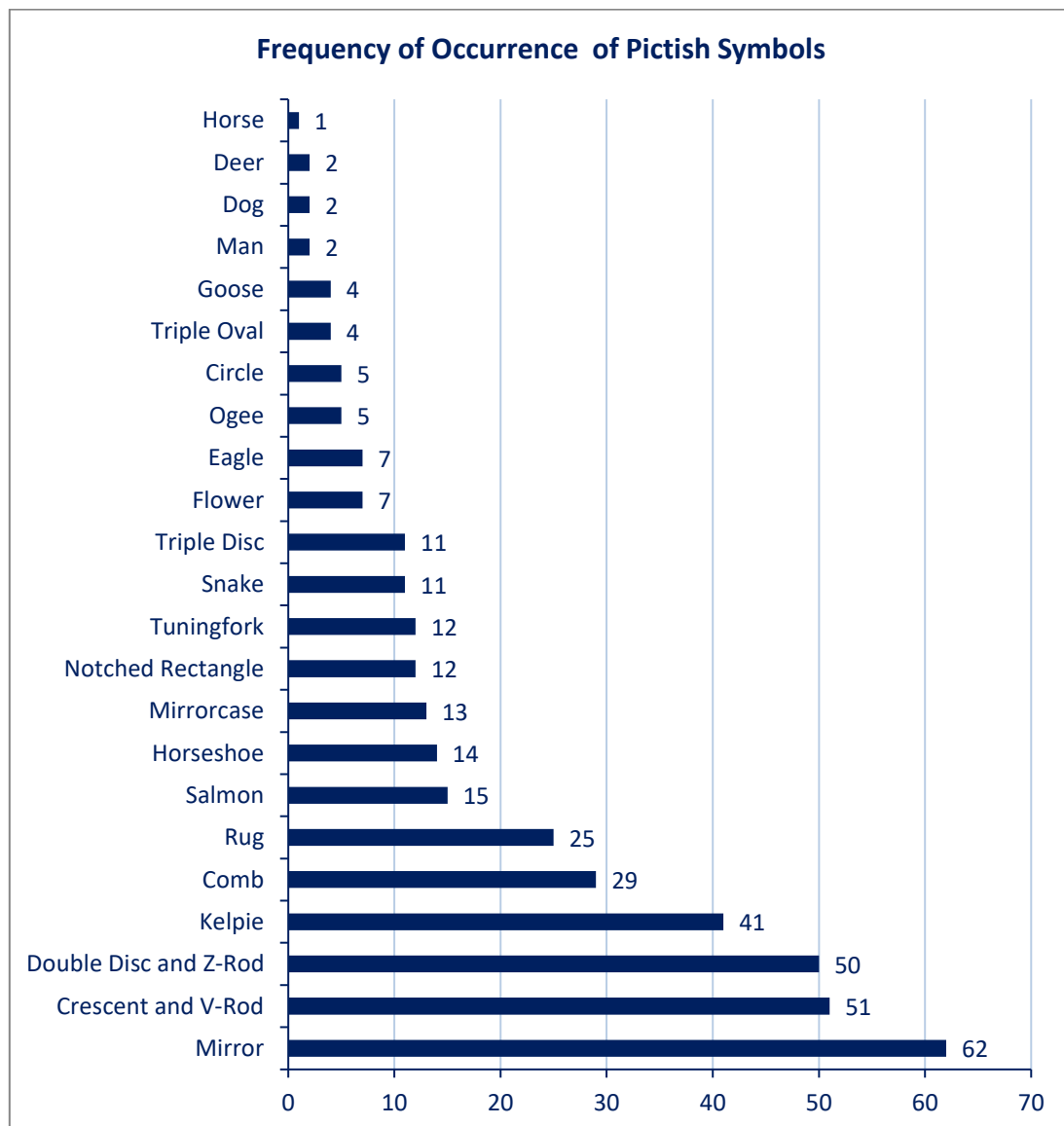
The Class II stones with their inclusion of Pictish Crosses alongside the Pictish symbols have been dated based on the presence of the cross assumed to be associated with Christianity representing the acceptance of Christianity in Scotland to around 800-1000AD. The Class I Pictish Symbol stones are believed to be earlier and have been suggested to date from 600-800 AD using their stylistic similarity to artwork found in the Lindisfarne gospel. The estimated date, proposed around a century ago, despite the highly uncertain nature of the evidence has not been contested and has therefore gathered a weight of acceptance that is perhaps unjustified.

There is however the possibility, given the symbols carved on the Class I stones may represent stellar constellations, that they contain astronomical information that may allow the date of their carving to be more accurately estimated.

Significance of the frequency of occurrence of the different Pictish Symbols carved on the Stones

The Pictish symbols have been proposed as representing constellations which may have been identified as stellar deities but the question arises as to why of the many symbol constellations that could have been carved, only particular symbols and symbol combinations were chosen to be depicted.

The symbol stones chosen for analysis are mostly complete and give a good representation of the combination of symbols originally carved. The frequency of occurrence of each of the symbols was determined to identify which symbols and therefore constellations, were most commonly depicted and by inference, most important to the people who carved the stones.



Graph 1 showing the relative frequency of occurrence of the Pictish symbols on the 126 faces of the selected Class I Pictish Symbol Stones.

Stone Circle Alignments

A previous study of the Scottish stone circles by the author revealed that, when viewed from two viewpoints on the circumference of the circle, the stones aligned with the Sun on the horizon on days when important bright stars aligned due South at Civil Twilight. When the constellations and the Pictish symbols associated with these constellations are examined it is apparent that four of the constellations concerned are those that are most frequently represented on the Pictish Stones (Virgo, Coma Berenices, Pisces and Gemini) despite the fact that the stone circles date from several thousand years before the Pictish Class I stones. Perhaps this is evidence that the same or a similar belief system based on the stars was in place from the time of the Stone Circles to the time when the Class I Pictish Symbol stones were carved.

Stone Circle Alignment	Pictish Symbol
Spica, Virgo	Mirror
Betelgeuse, Orion	Man
Capella, Auriga	Deer
Deneb, Cygnus	Goose
Pollux, Gemini	Rug
Scheat, Pisces	Salmon
Mel 111, Coma Berenices	Comb

Table 5.

Pictish Calendar

Today in Scotland the calendar is punctuated by festival days or holy days (holidays) dedicated to religious figures from the bible and saint's days so perhaps it is logical to consider that in ancient times the pantheon of deities represented by the star gods would likewise have been celebrated on festival days associated with them. Furthermore the days of their celebration may have coincided with the time that they occupied an important position in the sky.

The most frequently carved Pictish symbols and their associated constellations were selected to see whether the Pictish calendar could be reconstructed. The days when these important constellations appeared due South in the sky at Civil Twilight can be determined to see whether their distribution throughout the year resulted in a calendar where the festival days divide the year into evenly spaced periods of time. The calendar can conveniently be represented as a circle or "wheel of the year" where the "spokes" represent the festival days. The days on which the stars are aligned due South at Civil Twilight changes as a function of time over the centuries, as such the distribution of

festival days needs to be examined as a function of date to see if and when the appearance of a symmetrical arrangement of festival days throughout the year occurs. The finding of an even distribution of festival days may indicate the likely date when the calendar was first designed.

The Mirror, Comb, Salmon, Kelpie, Rug, Horseshoe, Tuningfork, Triple Disc, Flower, Eagle, Triple Oval and Goose constellation symbols were chosen to determine the days of alignment due South at Civil twilight as a function of time. These symbols represent the twelve most frequently occurring symbols whose associated constellations are most confidently proposed. The symbols containing V-Rod and Z-Rod patterns were omitted from the alignment for two reasons, firstly the symbols of the Crescent and Snake represent the constellations of Ursa Minor and Draco that are too high in the sky to be useful for festival day alignment purposes. The V-Rod and Z-Rod symbols may therefore identify these symbols as having some other purpose. For that same reason the Notched Rectangle symbol and the Double disc symbol that despite being low in the sky, also are usually depicted with a Z-rod, and were therefore similarly omitted from the selection despite the frequency of their representation. The Mirror Case symbol being identified with the same constellation as the Double Disc, Cetus, was similarly omitted from consideration.

The days considered as the days of alignment could be considered as the days when the brightest star in the constellation was aligned due South at Civil Twilight as in the case of the stone circles around 3000BC. However, many of the new constellations under consideration do not contain very bright stars as in the case of Pisces which may have alternatively been indicated by the alignment of the bright star Scheat lying directly above the Circlet of Pisces. The constellation of the Kelpie may be judged to be aligned when Gamma Monocerotis is aligned due South which also bisects the constellation of Gemini which lies above Monoceros. The Tuning-fork representing Taurus may be indicated by alignment with Lambda Tauri which lies at the midpoint of the twin horn-shaped arrangement of stars in the constellation. In the case of Aquarius, the point of bisection could be considered as its brightest star alpha Aquarii also known as Sadalmelik that also happens to bisect the constellation when the North-South line passing through the star is drawn. The other symbol constellations such as the Triple Disc of Sagittarius is bisected by the star Kaus Borealis. The Mirror and Comb symbols often appear together on many stones and the two symbols could be considered to align due South when the stars alpha and beta Comae are aligned due South and the constellation of Virgo is bisected by the North-South line running through these stars. As mentioned previously, the Rug representing the constellation of Gemini is bisected by the North-South line that runs through the star Gamma Monocerotis represented by the Kelpie symbol so these two symbols could be considered as representing the same festival day. The Horseshoe, Lyra appears almost directly above the constellation of Aquila the Eagle. The brightest stars

Vega in Lyra and Altair in Aquila are bisected by the star Sulafat which could have been used as a common marker for the alignment of both these constellations as the two constellations are bisected by the North-South line that passes through Sulafat.

The days of alignment were measured for the following stars and their constellations

Symbol	Stars, Constellations	Time of Alignment due South
Comb and Mirror	Alpha Comae, Coma Berenices Virgo	End of Civil Twilight
Horseshoe and Eagle	Sulafat in Lyra Aquila	Start of Civil Twilight
Goose	Deneb, Cygnus	Start of Civil Twilight
Salmon	Pisces using Scheat as marker	End of Civil Twilight
Flower	Sadalmelik Aquarius	End of Civil Twilight
Tuningfork	Lambda Tauri, Taurus	End of Civil Twilight
Kelpie and Rug	Gamma Monocerotis Monoceros and Gemini	Start of Civil Twilight
Triple Disc	Kaus Borealis, Sagittarius	End of Civil Twilight

Table 6

The days of alignment of the stars and their constellations were determined using the archaeo-astronomy program Skymap Pro II. The dates of alignment were found for both End of Civil Twilight at dusk and Start of Civil Twilight at dawn for the years 800AD back to 2000BC at 400 year intervals. The days of alignment were described as the dates we use today in our calendar. The dates were then expressed as spokes on the wheel of the 365 day year calendar similar to that used in the Wiccan calendar.

Mirror and Comb, Virgo and Coma Berenices marked by Alpha Comae		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	6 May	21 Nov
1600BC	6 May	22 Nov
1200BC	7 May	23 Nov
800BC	7 May	24 Nov
400BC	7 May	25 Nov
1AD	7 May	26 Nov
400AD	7 May	27 Nov
800AD	7 May	28 Nov

Table 7(i)

Horseshoe, Lyra and Eagle, Aquila marked by Sulafat in Lyra		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	14 Jul	3 Mar
1600BC	15 Jul	11 Mar
1200BC	17 Jul	19 Mar
800BC	21 Jul	29 Mar
400BC	26 Jul	8 Apr
1AD	1 Aug	20 Apr
400AD	10 Aug	30 Apr
800AD	20 Aug	9 May

Table 7(ii)

Goose, Deneb in Cygnus		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	25 Sep	13 Jun
1600BC	5 Oct	16 Jun
1200BC	12 Oct	19 Jun
800BC	19 Oct	21 Jun
400BC	26 Oct	21 Jun
1AD	1 Nov	21 Jun
400AD	5 Nov	21 Jun
800AD	8 Nov	21 Jun

Table 7(iii)

Salmon, Scheat above Pisces		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	18 Dec	25 Jul
1600BC	20 Dec	25 Jul
1200BC	23 Dec	25 Jul
800BC	24 Dec	24 Jul
400BC	26 Dec	24 Jul
1AD	27 Dec	24 Jul
400AD	28 Dec	23 Jul
800AD	29 Dec	23 Jul

Table 7(iv)

Flower, Sadalmelik in Aquarius		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	29 Sep	15 Jun
1600BC	15 Oct	22 Jun
1200BC	30 Oct	27 Jun
800BC	8 Nov	29 Jun
400BC	16 Nov	1 Jul
1AD	22 Nov	2 Jul
400AD	27 Nov	3 Jul
800AD	30 Nov	3 Jul

Table 7(v)

Tuningfork, Lambda Tauri in Taurus		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	3 Feb	27 Aug
1600BC	3 Feb	27 Aug
1200BC	4 Feb	27 Aug
800BC	4 Feb	27 Aug
400BC	5 Feb	27 Aug
1AD	5 Feb	27 Aug
400AD	6 Feb	27 Aug
800AD	7 Feb	27 Aug

Table 7(vi)

Kelpie and Rug, Gamma Monocerotis in Monoceros and Gemini		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	1 Mar	19 Sep
1600BC	1 Mar	19 Sep
1200BC	1 Mar	19 Sep
800BC	1 Mar	19 Sep
400BC	1 Mar	19 sep
1AD	1 Mar	19 Sep
400AD	1 Mar	19 Sep
800AD	1 Mar	19 Sep

Table 7(vii)

Triple Disc, Kaus Borealis in Sagittarius		
Year	Date of alignment due South at End of Civil Twilight (Dusk)	Date of alignment due South at Start of Civil Twilight (Dawn)
2000BC	20 June	15 Jan
1600BC	21 June	18 Jan
1200BC	22 June	22 Jan
800BC	23 June	28 Jan
400BC	25 June	4 Feb
1AD	27 June	14 Feb
400AD	1 Jul	27 Feb
800AD	8 Jul	15 Mar

Table 7(viii)

It is very useful that certain stars are aligned on a constant or relatively fixed day for the entire period from 800 AD - 2000 BC as this establishes a framework into which the other moving dates of alignment can be fitted. The Kelpie and Rug, the Tuning fork, the Salmon, the Goose and the Mirror and Comb give an almost constant date of alignment over the centuries and provide a clue to the way in which the year may have been divided. The dates indicated are around the 19th September, the 4th February, the 21st December, 21st June and the 6th May respectively. The pattern of their distribution when represented as spokes on the wheel of the year is shown below by black lines.

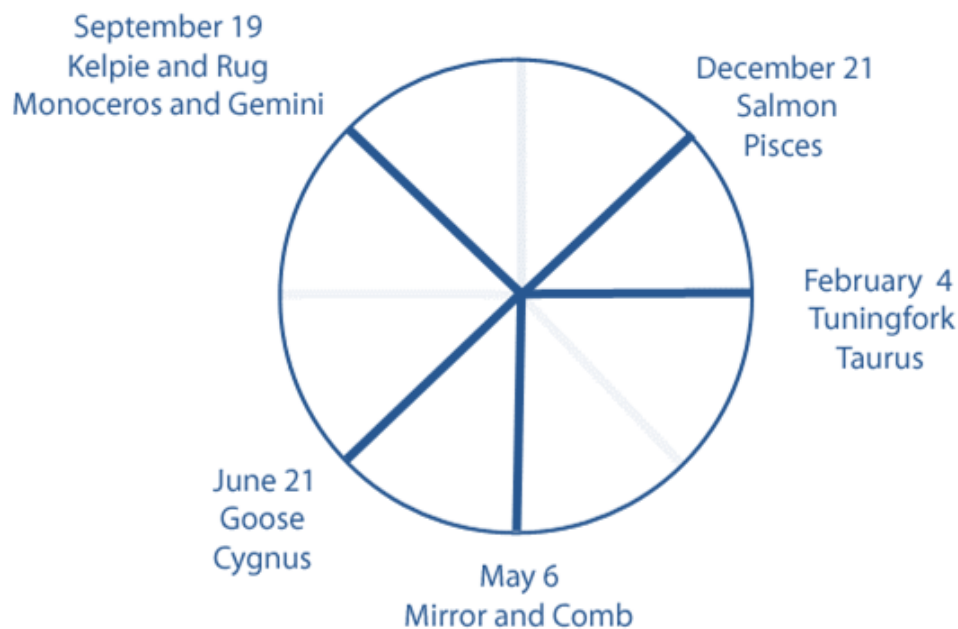


Diagram 1 Wheel of the year showing those festival days (in dark blue) that remain almost constant from 800 AD - 2000 BC. The light blue lines are the suggested "missing" festival days

The lines in dark blue are constant within a few days over two millennia and their pattern suggests that the wheel of the year may have been divided into eight periods. The possible "missing" festivals are shown by the pale lines. This general pattern is remarkably

similar to the Wiccan calendar that also has eight festivals. The light blue lines correspond to dates that would complete the division of the year into eight equal periods. The approximate dates corresponding to the light blue lines are the 4th November, the 20th March and the 5th August. Examining the dates of alignment of the other constellations reveals that two of the festival days can be accounted for by the alignments of Aquarius due South at End of Civil Twilight between 800-1200BC around 4th November and the alignment of Lyra and Aquila due South at the Start of Civil twilight around 1200BC on the 20th March.

Pattern of Wheel of the Year Calendar as a Function of Date based on Pictish Symbols carved on the Class I Stones

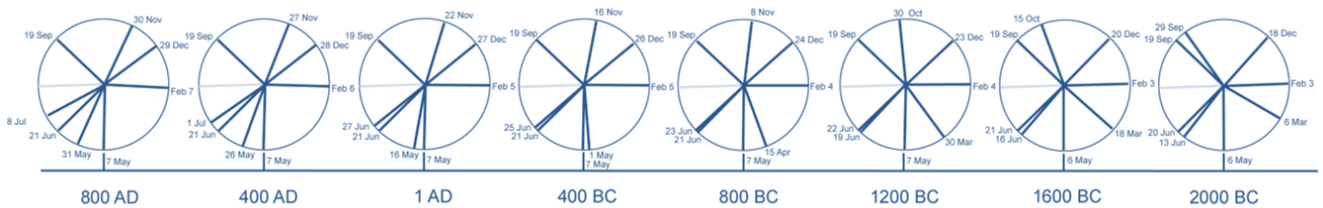


Diagram 2

By plotting the days of alignment of Sulafat in Lyra and Sadalmelik in Aquarius, it can be seen that the days of alignment like hour hands on a clock move clockwise around the wheel as the centuries progress from 2000BC forward in time. The positions that correspond to the hour hand positions for 12 o'clock, half past four and nine o'clock complete the nearly symmetrical division of the wheel of the year into eight parts.

When the days of alignment are plotted as a wheel of the year (Diagram 2) the festival days represented on a 366 day wheel form a pattern that appears to be most symmetrical and evenly divided by the days of alignment of the stars around 1200BC. This date is far earlier than expected given conventional wisdom estimates that the Class I stones were carved around 600-800 AD but the highly uncertain nature of the currently accepted date should be taken into account. This pattern of eight almost equally spaced festival days might be expected from a planned calendar and shares its appearance of eight equally spaced festival days with the Wiccan Calendar. There is though one day that appears to be missing from the calendar namely the line marked in grey on the diagram representing the 5/6th August and the alignment of Sulafat on October 30th does not describe a perfect arrangement of festival days for the important Start of Winter Festival.

Further Analysis of the Date of Carving of the Class I Pictish Symbol Stones

Although the choice of the most frequently carved symbols involved a certain degree of subjectivity especially with respect to the omission from consideration of the Crescent and V-Rod, the Double Disc and Z-rod, the Snake and Z-Rod and the Notched Rectangle and Z-Rod, these symbols will now be examined to show the significance of the V-Rod and Z-Rods associated with these symbols, what these symbols represented, how these symbols were used and how they can provide two further avenues of date analysis for the Class I Pictish symbol stones which support the proposed early date of 1200BC.

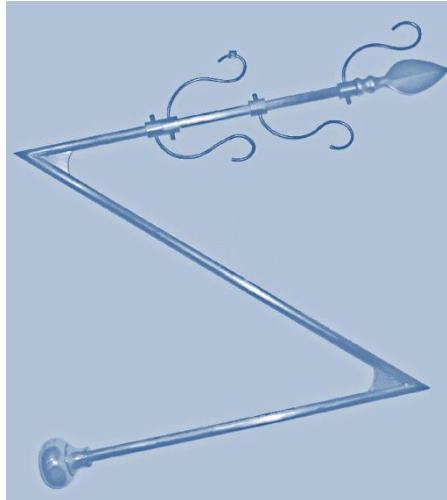
Alternative Dating Method

There are two symbols that may contain important information about when the Class I symbol stones were carved but those symbols need to be deciphered before the accurate dating can be carried out. The two important symbols are referred to as the Z-Rod and the V-Rod.

The Z-Rod

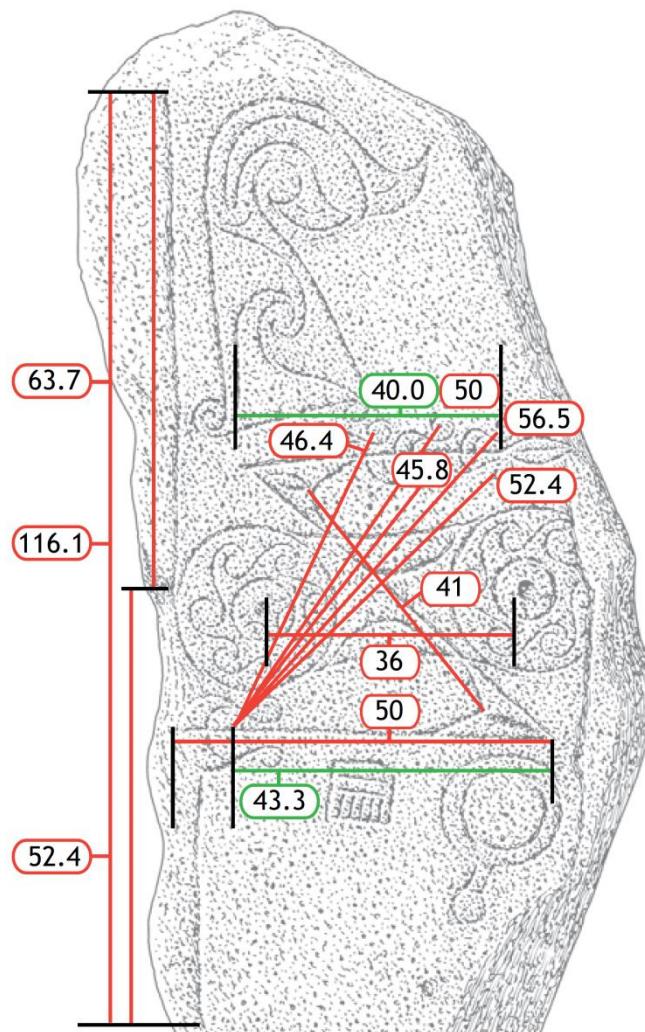
There are three Pictish symbols decorated with the symbol known as the Z-Rod, they are the Double Disc and Z-Rod, the Serpent and Z-Rod and the Notched Rectangle and Z-Rod. When the appearance of the Z-Rod is examined it appears as a broken spear with a leaf shaped blade at one end and a spherical knob at the other and what appear to be a series of hooks fitted on the upper shaft of the Z-shaped spear. The Pictish spear described by the Romans had the unusual property of having an apple -shaped knob at its lower end just as the Z-Rod has. The apple knob was made of bronze and is reported by the Romans as making a rattling sound when the spear was shaken. The hook shaped appendages may have been used to suspend the Z-Rod by and the heavy apple knob may have provided a bob. The different hooks would allow the Z-Rod to swing with different periods depending on the distance between the hook and the centre of gravity of the bob in the manner of what today would be recognised by physicists as a compound pendulum. This is not a well-known instrument and we are much more familiar with a pendulum consisting of either a string with bob attached or the pendulum used in clocks consisting of a rigid rod fitted with a brass bob at its end and this is because when time is measured today it is concerned with seconds , minutes and hours and there is no need to have a compound pendulum with more than one period of oscillation. However if the Picts were measuring time periods using a pendulum there is no reason why they might not have used a series of different pendulum lengths to measure different periods of time, in which case a compound pendulum could have been a useful device. This hypothesis has some support in that when the Pictish stone from Dunnichen is examined and the lengths measured between the hooks and the centre of gravity of the Z-Rod, lengths of

pendulums are revealed that correspond to those found in the paper "Revisiting the Megalithic Yard".



Z-Rod model fabricated from brass as a compound pendulum

Twelve pendulum lengths were found to account for the dimensions of the Scottish stone circles. The pendulums could have been used to measure both time and length in an integrated system of measurement. The system of measurement lengths were revealed by mathematical analysis of the dimensions of the Scottish stone circles and found to consist of the measures 35.96cm, 41.12cm, 45.75cm, 46.35cm, 50.00cm, 52.36cm, 56.48cm, 58.25cm, 63.66cm, 80.9cm, 116.50cm, and 161.8cm. Examining the Z-Rod carved on the Dunnichen stone reveals evidence of some of these lengths when measured between the hook patterns and what would be the centre of the bob as represented by a carved dot on the Z-Rod. If the Z-Rod represented a compound pendulum then it may be that the association with certain Pictish symbols may indicate constellations where star pairs were present at the time of carving that could be used to calibrate the different pendulums.



Dunnichen Stone showing pendulum lengths 36cm, 41cm, 45.8cm, 46.4cm, 50cm, 52.4cm, 56.5cm, 63.7cm 116.1cm.

If the Z-Rod was a compound pendulum maybe it was used for ceremonial purposes as its complex form seems too bulky for everyday use where a simple string with knots tied along its length and a stone bob would be more practical. The question arises as to why a compound pendulum would be associated with the three symbols that we have hypothesised to be the constellations of Cetus, Draco and Vela. The answer may lie in identifying these constellations as having star pairs separated by the precise angle (measured as the Hour Angle) that would allow the pendulums to be calibrated as the stars appear to rotate as the Earth revolves. The angles required to calibrate the series of pendulums are shown below. each of the measures when used as a pendulum has a whole thousand number of swings for the time it takes for the Earth to rotate by the required angle relative to the star. The separation of a pair of stars by the required angle allows the first star in the pair to be aligned with a vertical pole and then swinging the pendulum and counting the number of oscillations required for the second star in the

pair to replace the first star as being aligned with the vertical pole. The pendulum can be adjusted in length until the required number of swings are obtained.

Pendulum Length (cm)	Angle (Megalithic Degrees)	Number of Swings	Pendulum Type
35.96	23	9000	Sidereal
41.12	41	15000	Sidereal
45.75	23	8000	Solar
46.35	29	10000	Sidereal
50.0	27	9000	Solar
52.36	37	12000	Sidereal
56.48	16	5000	Sidereal
58.25	13	4000	Sidereal
63.66	17	5000	Sidereal
80.9	23	6000	Sidereal
116.5	23	5000	Sidereal
161.8	27	5000	Solar

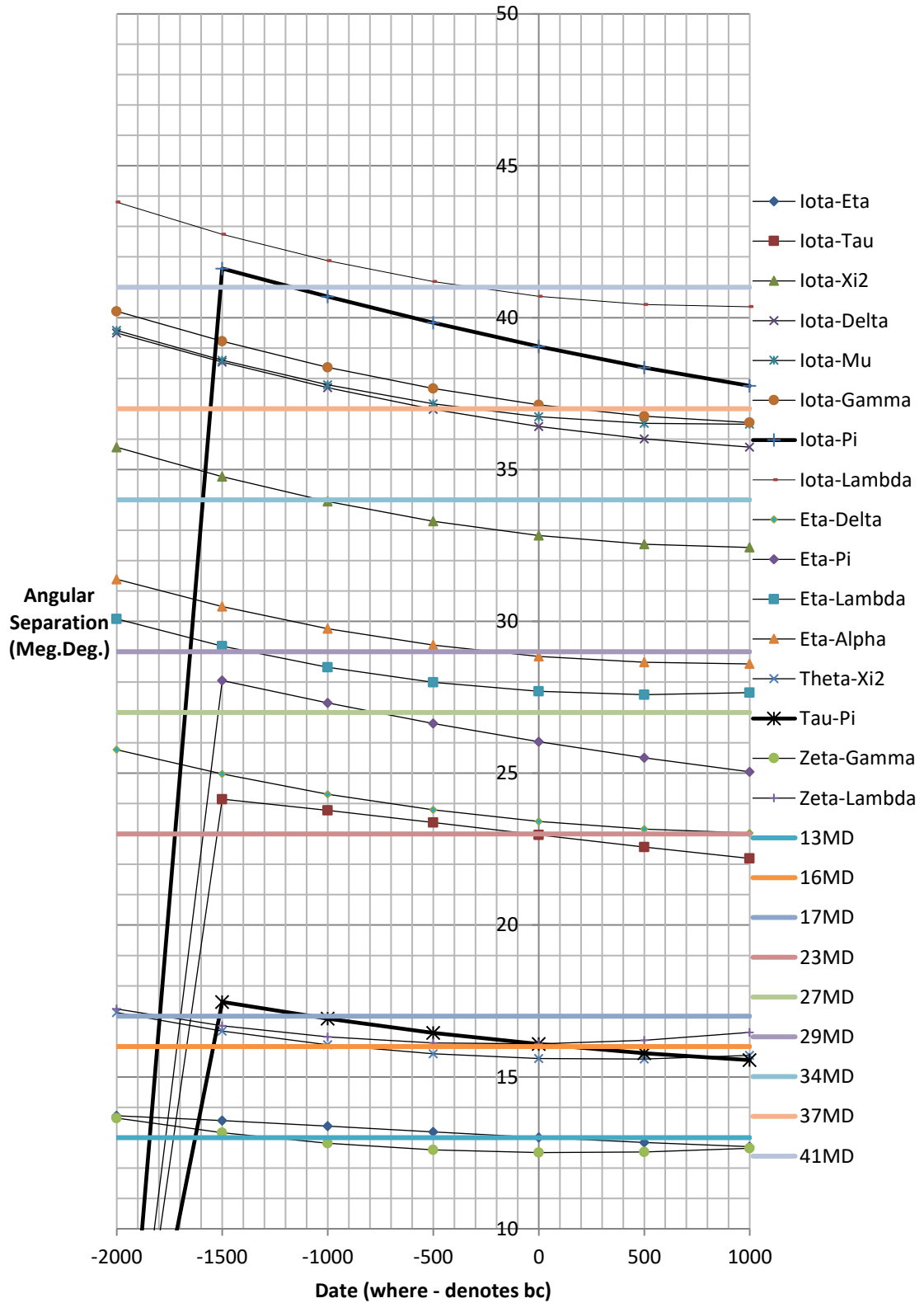
The separation of star pairs in the constellations of Cetus, Draco and Vela was examined by measuring the difference between the Hour Angles of every star pair in the constellation for dates between 2000bc and 1000ad. Facing South looking up towards the Pole star, the stars appear to move in a clockwise direction, the first star in each pair was considered to be the star furthest West in the pair. This would allow the alignment of the first star to be made as the starting point for the counting of swings of the pendulum.

Over very long time periods the stars move in different directions and at different rates relative to Earth. The rate of movement is very slow but is significant over the centuries and millennia. If star pairs were used to calibrate the pendulums, then star pairs separated by the required hour angles can be searched for in these constellations as a function of date to determine whether such suitable star pairs existed and on what date these star pairs gave the precise separation required to accurately calibrate the pendulums. Three Pictish symbols the Notched Rectangle, the Double Disc and the Snake representing the constellations of Vela, Cetus and Draco are decorated with a Z-Rod which is postulated to represent a compound pendulum. The presence of the Z-Rod may therefore identify these constellations as having star pairs separated by angles that could have been used to calibrate pendulums. As the Earth rotates about its axis, from a viewpoint in Scotland, looking up the stars appear to rotate. The Hour Angle describes the position of a star projected vertically down onto the horizon at any point in time and due South represents 24.00h with due West representing 06.00h, due North 12.00h and due East 18.00h. The measurement of angular separation between star pairs in a

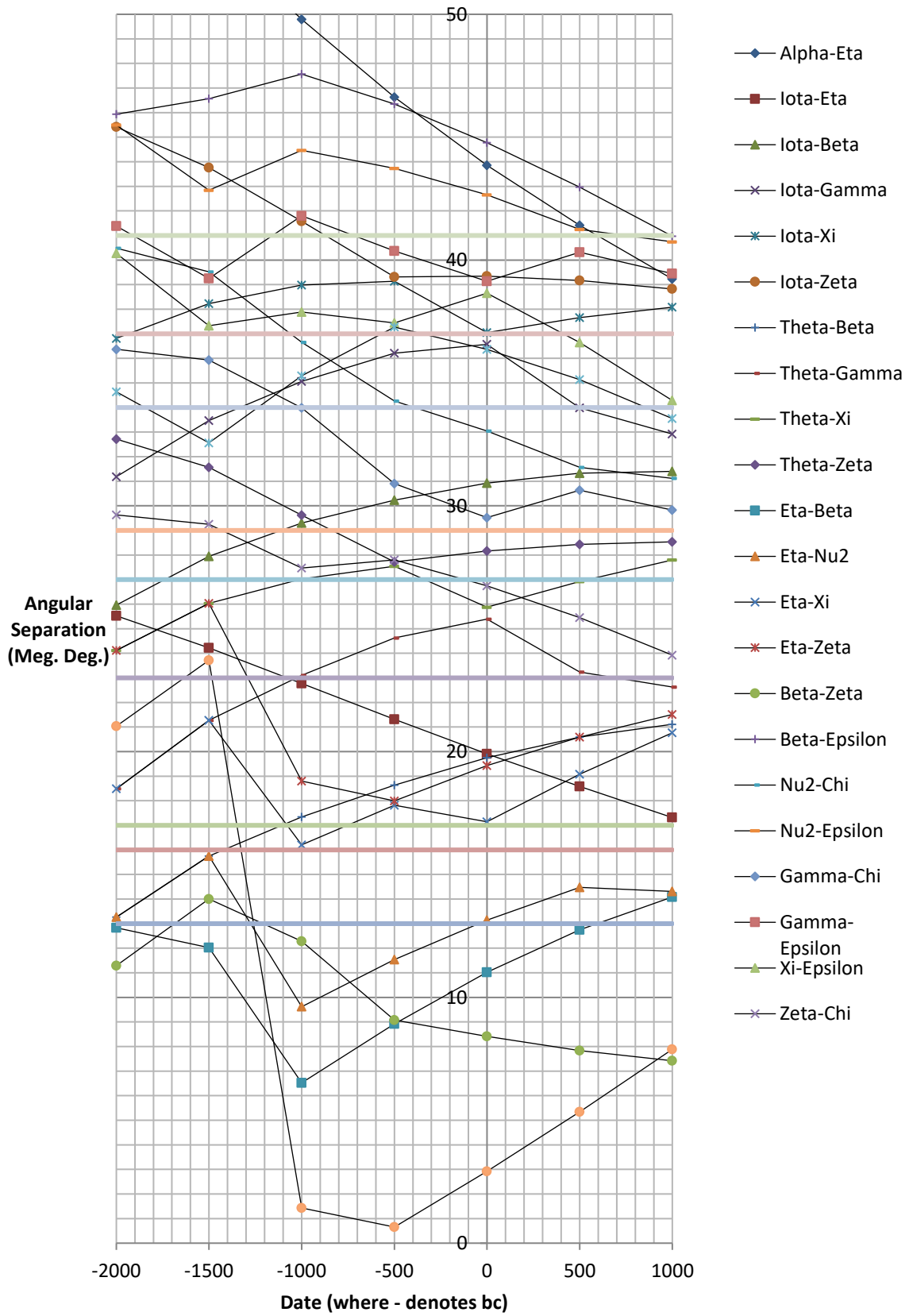
constellation can be determined by measuring the Hour Angle of each star on a particular date and then calculating the difference in Hour Angles between all the various star pair permutations. The easiest way to achieve this is to convert the Hour Angles into a reading of seconds and then order the set of readings from largest to smallest and systematically subtract the Hour Angle expressed as seconds for each star from the largest value. The angular separation in seconds can then be converted to an angle expressed as Megalithic Degrees by dividing by the factor 236.0656 ($24 \times 60 \times 60 / 366$). The angular separation of all the star pairs can be determined as a function of date and then plotted to see if there is a time when their angular separation coincides with the angle required to calibrate one of the 12 pendulums used. The angular separations required for calibration purposes are those shown in Table X . In this manner if the constellations were being identified as ones where calibration of pendulums could be achieved then it should be possible to identify a date or possible dates when the stones were carved. Although it might be expected that over a long period such as 2000 BC to 1000 AD many star pairs may have satisfied the condition of separation that allowed this at a particular date, the date on which useful separations occurred would need to be the same for star pairs in all three constellations on the same date, the date that the Class I Pictish symbols were carved. A constellation with X stars has $X(X-1)/2$ or $(X^2-X)/2$ star-pair permutations (divided by two because when we consider the alignment it is most likely that the first star aligned would be the one further West of the pair so that the second star comes into alignment within 180 degrees of rotation of the Earth). For the purpose of determining calibration star pairs the angles of interest for separation are only those between 13MD and 41 MD.

The star pair angles of separation in Megalithic Degrees are plotted against time in the following graphs for Cetus, Draco and Vela. Only star pairs that are separated by one of the required calibration angles at some time in the period 2000 BC-1000 AD have been plotted except for the star pairs in Vela which have all been plotted due to the low number of stars visible in the constellation. Furthermore, as there are only two stars visible after about 1400 BC and they are never separated by one of the important angles used to calibrate the pendulums another approach has been taken where whole thousands of swings for different pendulums have been plotted that correspond to the angular separation of the star pairs.

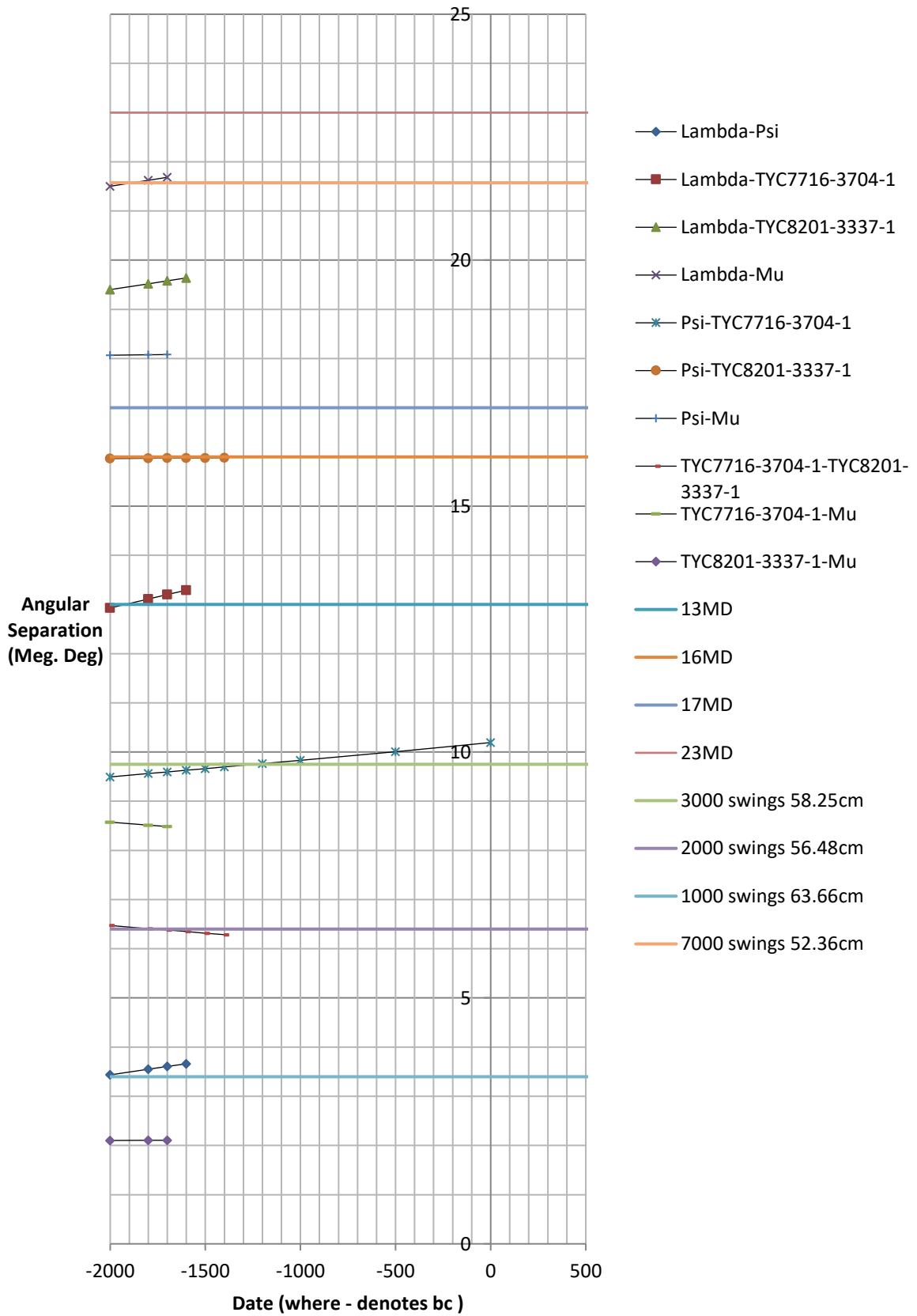
Angular separation of visible Star Pairs in the Constellation of Cetus from 2000bc - 1000ad



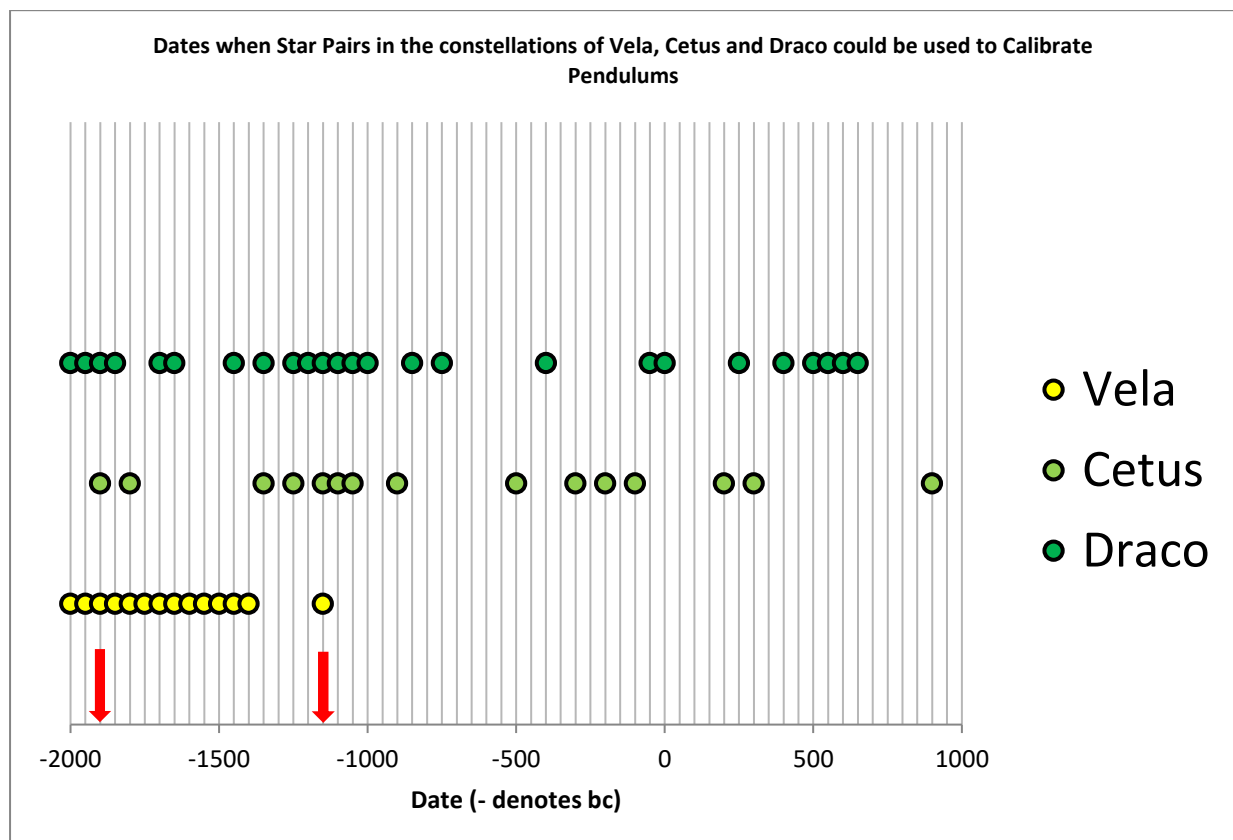
Angular Separation of Star Pairs in the Constellation of Draco from 2000bc - 1000ad



Angular Separation of Visible Star Pairs in the Constellation of Vela from 2000bc -1000ad

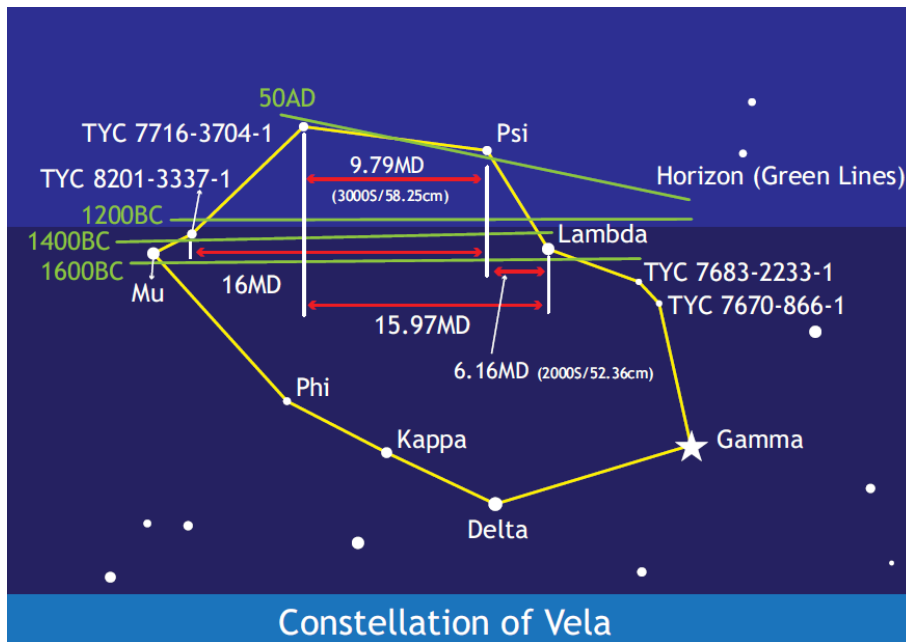


The pattern of separation of star pairs in Cetus and Vela follow straight forward curves as the constellations are low in the sky far from the point of apparent rotation about the Celestial Pole and they rise from and set. The graph of Cetus shows four star pairs that only can be viewed after 2000BC when two stars Tau Ceti and Pi Ceti appear above the horizon. The curves on the graph of star pairs in Vela are very short because only some of the stars in the constellation are visible above the horizon and the whole constellation is sinking below the horizon as time progresses until the entire constellation is invisible around 170ad when the final star Psi Velorum disappears below the horizon. The pattern of curves of star pair separation for the constellation of Draco differs from the other two constellations because the stars in Draco are circumpolar and never rise nor set. The fact that the constellation rotates about the Celestial Pole can produces large changes in angular separation between certain stars as a function of time especially if certain star pairs align with the changing position of the Celestial Pole.



Graph showing the dates on which star pairs give angular separations that could have been used to calibrate the series of pendulums proposed.

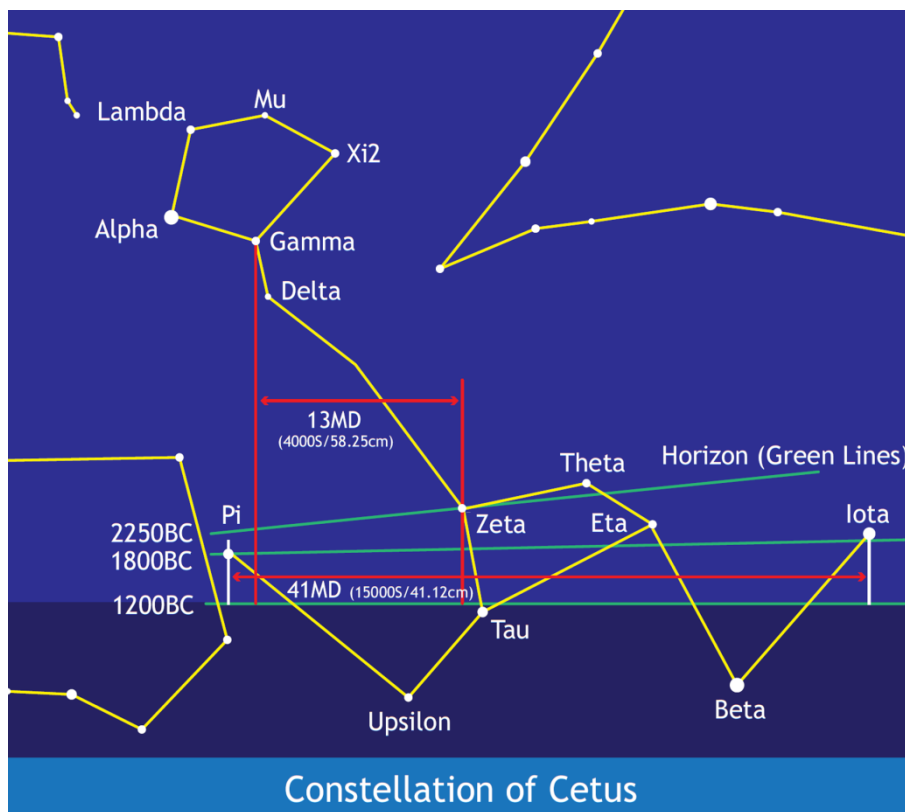
Only two dates were found when all three constellations had star pairs that could be used for calibration purposes namely 1900BC and 1150BC.



Separation of stars in Vela for 1200BC and positions of horizon relative to the stars.

The interesting point about the constellation of Vela is that after around 50 AD this constellation never rose above the horizon at the latitude corresponding to the land of the Picts, therefore if this constellation was represented by the Notched Rectangle, then it is unlikely that the stones were carved after 50AD. A pair of stars TYC 8201-3337-1 and Psi Velorum are separated by 16 MD around 1200 BC but the former star lies just below the horizon at this time, however the two stars that lie above the horizon (TYC 7716-3104-1 and Psi Velorum) are separated by 9.79MD which is equivalent to 3000 swings for a 58.25cm pendulum.

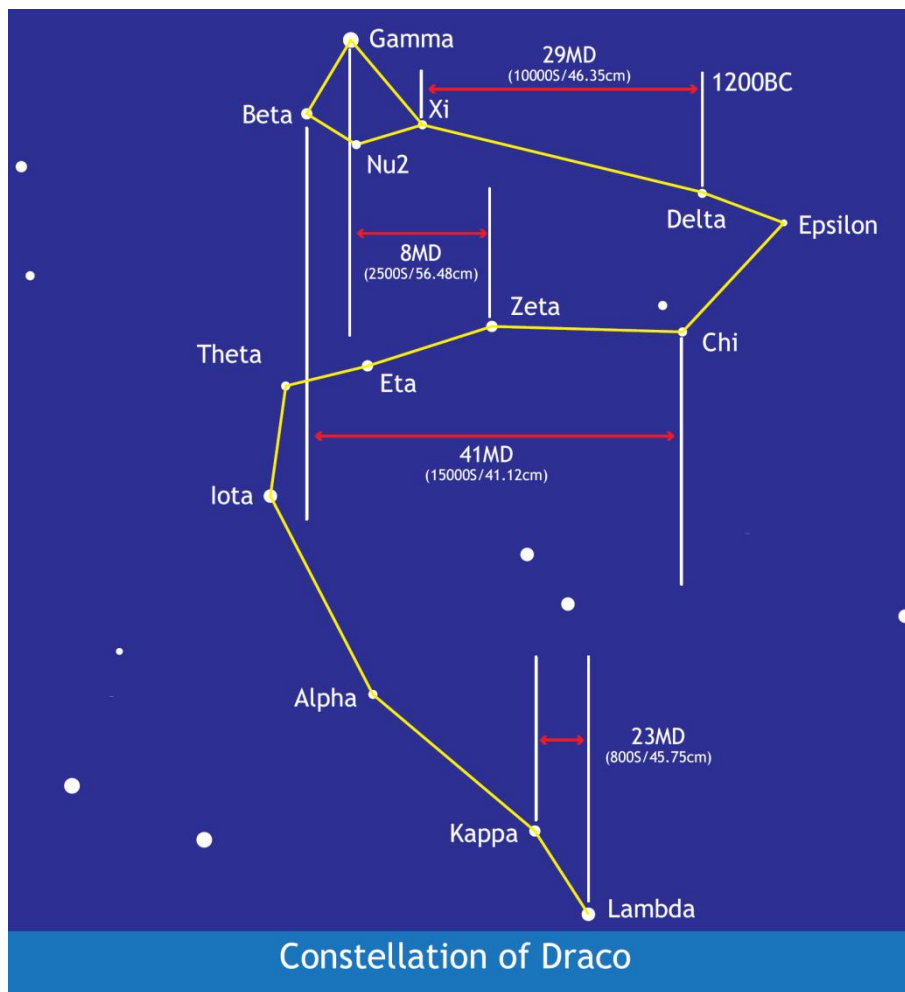
The Double Disc and Z-Rod is believed to represent the constellation of Cetus.



Separation of stars in Cetus for 1200BC and position of the horizon relative to the stars.

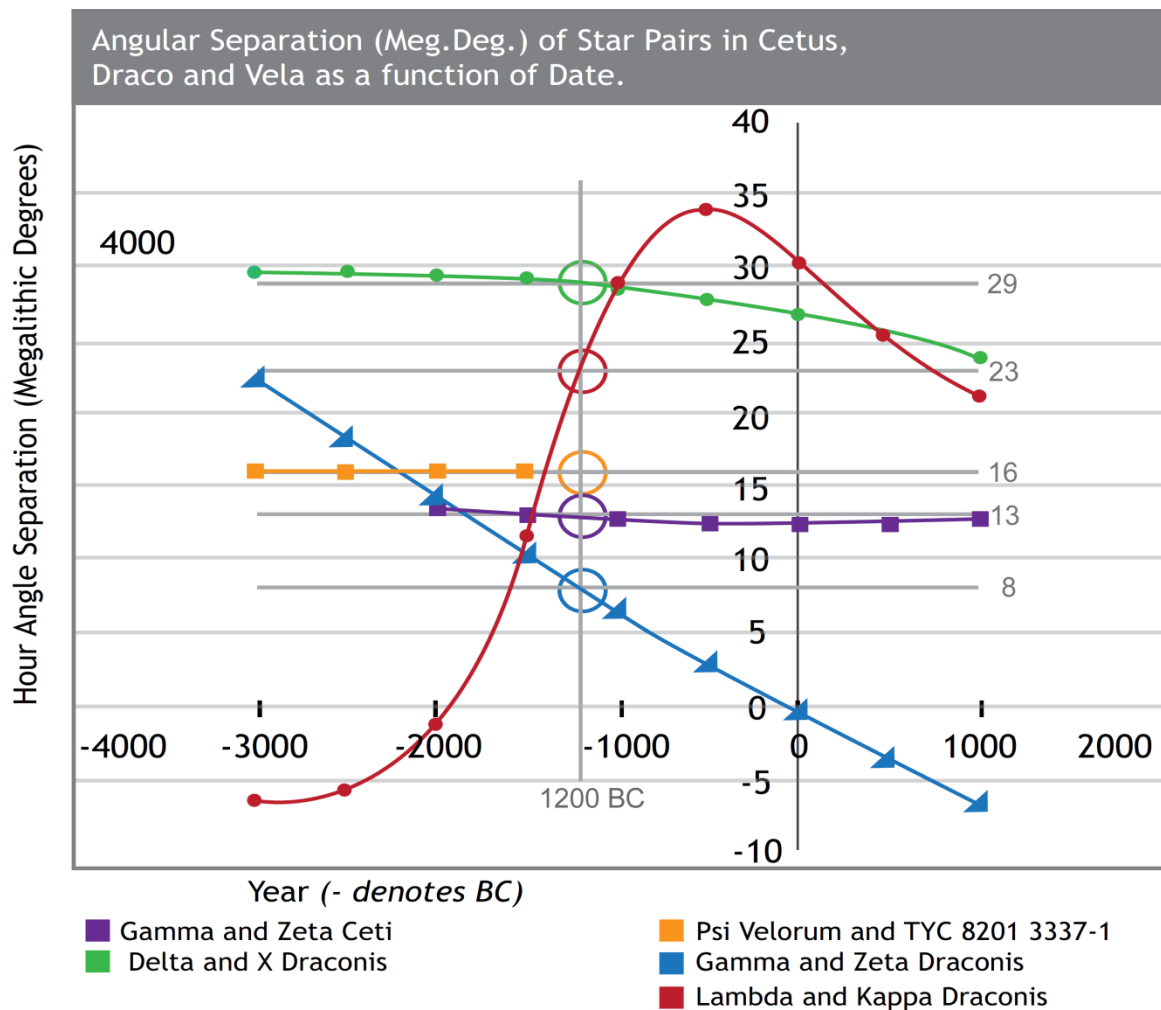
Examining the stars in Cetus two pairs of stars are found to be separated by precisely 13MD and 41MD that would allow the 58.25cm and 41.12cm pendulum to be precisely calibrated by aligning the first star and counting the number of swings until the second star became aligned. The star pairs are Gamma Ceti and Zeta Ceti (13MD) and Pi Ceti and Iota Ceti (41MD). These precise separations occur around the date 1200BC. In this case it is interesting that Tau Ceti didn't appear above the horizon until around 1200BC so that the appearance of the constellation as a Double Disc couldn't have been observed before this date by the Picts unless they travelled to lands further South. Indeed, the portrayal of Cetus as a "Mirror Case" may reflect this phenomenon as the double disc nature of the constellation was only observable from this time.

The Snake and Z-Rod pictish symbol is believed to represent the constellation of Draco



The stars in Draco are circumpolar and never set. There are four star pairs that could have been useful in calibrating pendulums around 1200BC they are Kappa and Lambda Draconis (23MD), Gamma and Zeta Draconis (8MD), Xi and Delta Draconis (29MD) and Beta and Chi Draconis (41MD) though the latter pair are actually separated by 41.16MD which may be regarded as outside the accuracy required to calibrate the 41.12cm pendulum.

The separation of five star-pairs in the constellations of Cetus, Vela and Draco are plotted as a function of time in the graph below. The relative movement of the stars as a function of time differs remarkably as observed by the different curves with respect to the direction and level of gradient.



Star pairs in the constellations Cetus, Draco and Vela indicate that around 1200BC these constellations could have provided star pairs that were useful in calibrating pendulums.

Identifying the Z-Rod as a compound pendulum and using the known important pendulum lengths from previous work by the author may identify Pictish symbols that incorporate the Z-Rod as constellations that were used at the time of carving of the Class I Pictish symbols as constellations that contained star pairs that were separated by useful angles that allowed the pendulum lengths to be accurately calibrated. It is admitted that this idea and analysis goes way beyond our current understanding but it delivers a result that is consistent with the date of around 1200bc proposed from the calendrical analysis.

There is a further more conventional analysis that can be followed to determine the likely date of carving the Class I Pictish Symbol Stones that involves the pattern of decoration of the Double Discs.

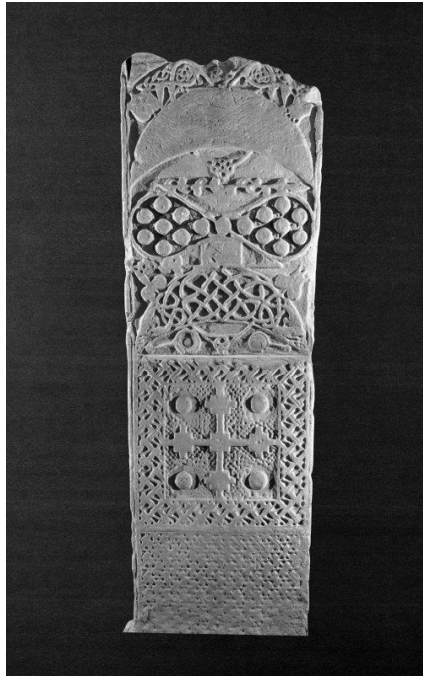
Dating the Class I and Class II Pictish Symbol Stones by Analysing the Decoration of Double Discs



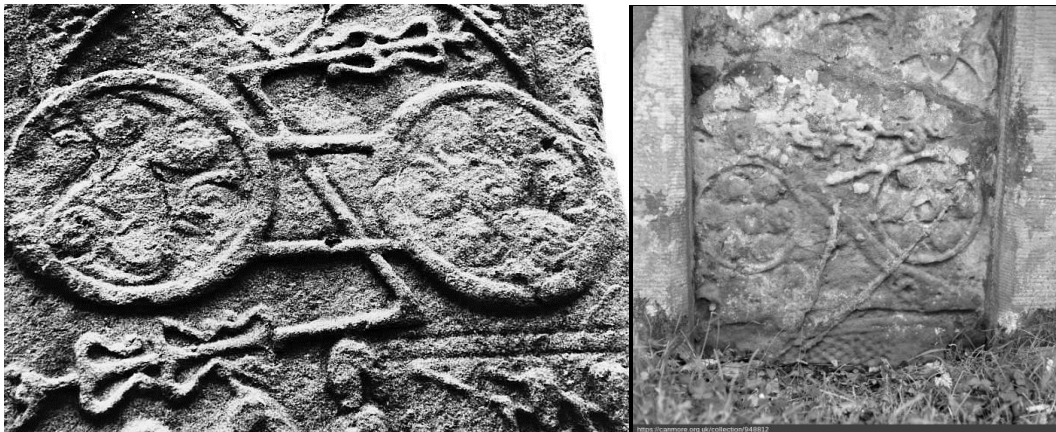
Class 1 Pictish Stone with 13 swirls (7 in the left disc and 6 in the right disc) that may coincide with the 13MD separation of Gamma and Zeta Ceti in the constellation of Cetus around 1200BC.

The Class I Dunnichen Stone on close inspection has a different pattern of swirls in each of the discs; the left disc has seven swirls whilst the right-hand disc has only six. Having seen that the constellation Cetus had two bright stars (Gamma Ceti and Zeta Ceti) that were separated by 13 Megalithic Degrees around 1200BC it may be that the thirteen swirls surrounding two dotted circles represent two stars separated by 13 MD.

To test whether this decoration is coincidental, the pattern of decoration of other double disc symbols can be examined to see whether a similar association can be seen regarding the number of swirls used to decorate the discs being representative of the angular separation of two stars in the constellation of Cetus.



Class II Rosemarkie Stone Double Disc symbol decorated with 17 circles



Double Disc and Z-Rod symbols on the Aberlemno III and Glenferness Class II symbol stones. Each is decorated with 14 circles

The decoration of the Double disc with 13 swirls on the Dunnichen Class I stone and with 17 circles and 14 circles on the Rosemarkie, Aberlemno III and Glenferness Class II Stones may allow the dating of the Class I and Class II stones. The stars Xi2 Ceti and Zeta Ceti are separated by 8.5MD (half of 17MD) whilst Upsilon Ceti and Eta Ceti are separated by 14.0MD

Class Symbol Stone	Stone	Number of circles within Double Disc	Star Pairs	Star Pair Separation (MD)	Date of Matching
I	Dunnichen	13	Gamma Ceti-Zeta Ceti	13	1100-1200BC
II	Rosemarkie	17	Xi2 Ceti-Zeta-Ceti	17/2	800-900AD
II	Aberlemno 3	14	Upsilon Ceti-Eta-Ceti	14	800-900AD
II	Glenferness	14	Upsilon Ceti-Eta-Ceti	14	800-900AD

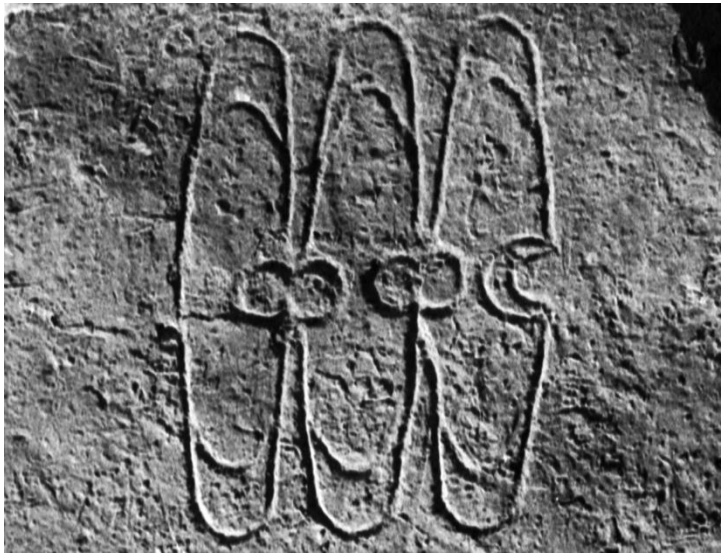
The analysis of the pattern of decoration of the Class I and Class II Double Disc symbols is consistent with a carving date of 800-900AD for the Class II stones which is within the time frame accepted by archaeologists for the Class II stones. The date of carving indicated by 13 swirls on the Dunnichen stone is consistent with the calendrical and pendulum analyses in this paper.

There is another symbol that has not yet been analysed, namely the Crescent and V-Rod, which could provide further information regarding the proposed date of carving.

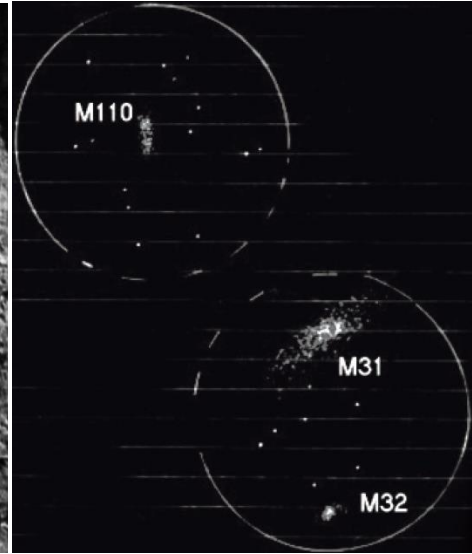
The Crescent and V-Rod

The Crescent and V-Rod symbol appears as a crescent decorated with different patterns and a V-Rod consisting of a bent Arrow. The symbol shares a similarity of form with the pattern of stars in the constellation of Ursa Minor but although the general crescent-like curvature is similar the similarity is not conclusive. This constellation lies high in the sky and is the location for the Celestial Pole. The Pole star is currently close to the star Polaris but the position of the pole changes over the millennia due to the precession of the Equinoxes caused by the slight wobble the Earth has as it rotates. The angle of the V-Rods carved on the many stones decorated with this symbol varies from 60-120 degrees. This variation in angle of the "V" could be just artistic license but taking the opposite possibility that the angle of each V-Rod was deliberately chosen leads us to consider that if it was chosen then the possible purpose of the Crescent and V-Rod becomes immediately obvious as an ancient prehistoric quadrant. The angle of the V and the possibility of an association with the Celestial Pole is consistent with the idea that the angle of the Crescent and V-Rod used as a quadrant could indicate the angle of deep space objects relative to the Celestial Pole. Today the position of deep space objects is described as the declination which is an angle either above or below the celestial equator. The angle is

described as either a positive angle or a negative angle but as the celestial equator is 90 degrees from the Celestial pole the angle could just as easily and more simply be described as an angle from the Celestial Pole. There is a Class I and a Class II stone that has the Crescent and V-Rod carved below the symbol of the Triple Oval. The Triple Oval symbol has been postulated to represent the constellation of Andromeda based in part on its similarity to the similarity of its form to the arrangement of the close proximity of three galaxies in this constellation namely the Andromeda Galaxy M31 and its two neighbours M110 and M32

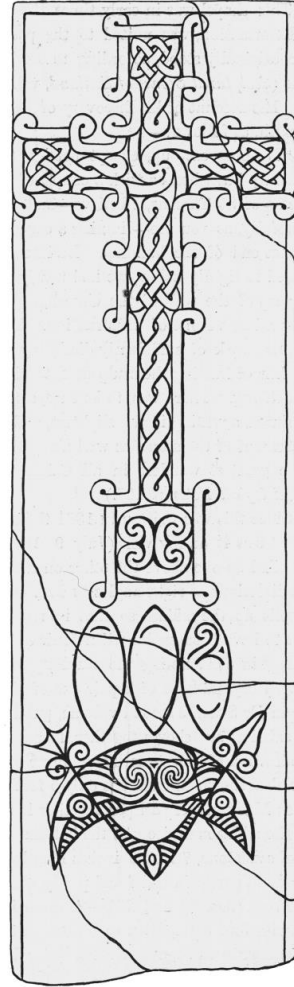
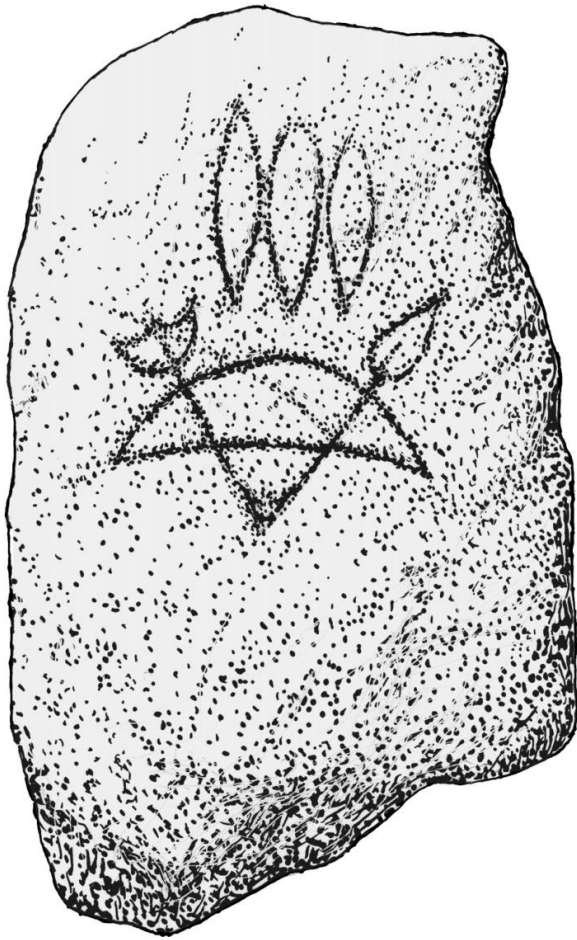


Triple Oval on Class I Stone from Sandside (140)



Cluster of three galaxies in Andromeda

The Andromeda galaxy (M31) is the closest galaxy to Earth and it can be just seen by the naked eye and is therefore the best candidate to test the hypothesis without having to overcome the issue of requiring a telescope to make an observation and measurement of angle though the presence of three galaxies together is not discernible to the naked eye.



The Class I Beaulieu stone (left) has a V-Rod angle measured as 66 degrees whilst the Class II Skinnet stone (right) has an angle measured as around 55 degrees. The declination of The Andromeda Galaxy M31 was determined as the angle from the Celestial Pole for years in the range 1500BC -1000AD.

Year	Declination	Angle from Celestial Pole
1000AD	+35 deg 43 min	54.7 deg
900AD	+35 deg 9 min	54.9 deg
800AD	+34 deg 37 min	55.5 deg
600AD	+33 deg 30 min	56.5 deg
500AD	+32 deg 56 min	57.0 deg
1AD	+30 deg 12 min	59.8 deg
500BC	+27 deg 31 min	62.5 deg
1000BC	+24 deg 56 min	65.1 deg
1200BC	+23 deg 56 min	66.1 deg
1400BC	+22 deg 57 min	67.0deg
1500BC	+22 deg 28 min	67.5 deg

The closest matches for the angles carved on the two stones suggest that the Class I stones were carved around 1200 BC and the Class II stones carved around 900 AD. These findings are consistent with the analyses of the Pictish calendar based on the alignments of the most commonly carved constellation symbols, the identification of constellations containing star pairs that could be used to calibrate pendulums around 1200BC, and the pattern of decoration of the Double Disc symbols.

Why were the stones carved?

The Class II stones are believed to have been carved around 800-1000AD and the date indicated by the Crescent and V-Rod angle for the declination of the Andromeda Galaxy of 900AD supports this date. The date indicated by the suggested Z-Rod compound pendulum analysis and the suggested V-Rod Quadrant analysis for the Class I Pictish Stones however gives a date that is over 1700 years earlier than currently accepted by archaeologists. The Class II stones are characterised by a large Pictish or Celtic Cross on one side associated with Christianity and Pictish symbols of the other face. The estimated date of around 900AD \pm 100 years coincides with the coming together of the Picts and Scots under Kenneth McAlpin around 843AD to form the nation we know as Scotland and perhaps the Class II stones were carved to celebrate this hugely important event. Perhaps the Class I stones were carved to mark an equally significant earlier event in Pictish history. Examining events that took place around 1200BC is problematic in that these were prehistoric times however one calamitous event that is known from geological evidence stands out as Mount Hekla in Iceland is believed to have erupted around 1159BC resulting in an extended series of massive long-lasting plumes of ash and dust that travelled on the prevailing winds eastwards to the British Isles which blotted out the Sun and the stars for a period of over twenty years in Scotland and Ireland. This information comes from the identification of a layer in the soil of volcanic glass-like material called tephra that is present all over Scotland that corresponds to the same material found in Iceland resulting from the Hekla IV eruption. The date of the eruption has been estimated to be 1159BC from analysis of growth rings on bog oak in Ireland and whilst the trees appear not to have been killed their growth seems to have been almost static as if surviving an extended winter period lasting around 28 years. If this event did occur at this time it would seem like a strong candidate for the reason why the Class I Pictish stones were carved as life in the lands occupied by the Picts would have been extremely difficult during this period and perhaps the stones were carved as votive offerings to the stellar deities to clear the skies and for the cycle of the seasons to return. It is remarkable that such ancient symbols could allow us to infer so much about our prehistoric ancestors and that such a story about their beliefs and calendar could be told by so few symbols. It is though even more remarkable that this prehistoric people not only venerated stellar deities but had developed an advanced technology to measure the position of the stars and their angular movement and separation and how this related to short time periods

of the Earth's revolution using pendulums and longer time periods through a calendar based on stellar and solar alignments.



Conclusions

The interpretation of the Pictish symbols as representing constellations seems reasonable in terms of both the similarity of identities in terms of their associations with animals, birds and fish for instance and the similarity of form or shape of the symbol and the constellation as represented by the pattern obtained when the brightest stars are joined by imaginary lines. However further support for the identification of the Pictish symbols as constellations is supplied when the days of alignment of the brightest stars in each of the constellations due South at Civil Twilight are examined. The most commonly occurring Pictish symbols result in a calendar where eight festival days are evenly separated throughout the year giving rise to a calendar similar to the Pagan Wiccan calendar described as a "Wheel of the Year". This calendar gives the most even separation of festival days around the year 1200BC. Although this date of 1200BC is much earlier than the currently accepted estimated date of sometime around 600-800AD there is other evidence to support the earlier date for the carving of the Class I Pictish Symbol stones which comes in the form of the Crescent and V-Rod symbol carved on both the Class I and Class II Pictish stones. The Crescent and V-Rod is believed to represent both the constellation Ursa Minor and a quadrant, an astronomical instrument used to measure the angle between the Celestial Pole (located in Ursa Minor) and a deep space object such as a star or a visible galaxy. The Andromeda Galaxy is visible to the naked eye and may have been represented as the Triple Oval Pictish symbol. There is a Class I Pictish Symbol stone and a Class II Pictish Symbol stone with a Triple Oval symbol above a Crescent and V-Rod symbol. The angle of the V carved on the two different Crescent and V-Rod symbols correspond to the angle separating the Celestial Pole and the Andromeda galaxy for the year of 800-1000AD for the Class II symbol stone and 1200BC for the Class I symbol stone. Another Pictish symbol known as the Z-Rod carved on three symbols, the Notched Rectangle and Z-Rod, the Serpent and Z-Rod and the Double Disc and Z-Rod is

believed to represent a Pictish compound pendulum made from a bent Pictish spear furnished with a series of hooks to hang and swing back and forth from. The association of the Z-Rod with these three symbols is believed to indicate three constellations that contained star pairs separated by precise angles that could be used to calibrate the different pendulum lengths. By measuring the hour angle between the different possible star pair combinations in each of these three constellations as a function of date it was found that only two dates corresponded with all three constellations having star pairs that would have been useful in calibrating the pendulums, these were 1950BC and 1200BC. The evidence from both the Crescent and V-Rod and the Z-Rod symbols supports the dating of the Class I Pictish symbol stones as being around 1200BC. Of course, the support depends on the interpretation of the Crescent and V-Rod representing a quadrant, the Triple Oval symbol representing the Andromeda Galaxy, the Z-Rod representing a compound pendulum and the Pictish symbols of the Snake, the Notched Rectangle and the Double Disc representing the constellations of Draco, Vela and Cetus respectively. Although the interpretation appears incredible in terms of being at odds with archaeological currently accepted wisdom and what is known of prehistoric technology, the new interpretation fits the facts and answers many questions which are otherwise unanswerable.

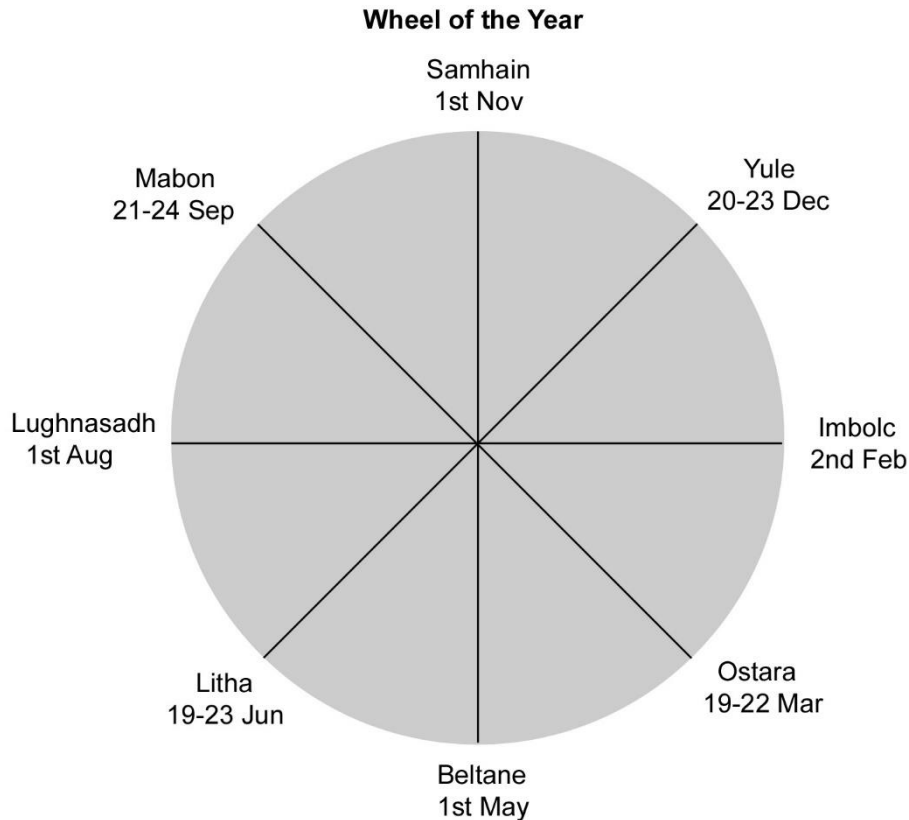
Appendix I

How were the different gods represented by the Picts and what stories were associated with them?

It may seem an unlikely possibility that images of pagan deities, worshipped by our ancestors over three thousand years ago, could have been left by the Picts for us to see, when there are no obvious surviving images of deities carved on the Class I stones, apart from the animals associated with the constellations. Furthermore, given that no writing survives from this time nor any account by others who visited the land of the Picts, such as the Romans, it may seem like a very unlikely prospect that we would get an opportunity to see the faces of some of the gods that were so important to our ancient ancestors over three thousand years ago. However, given the fact that deities associated with the salmon, the goose, the deer, the dog, the eagle, the boar, the bear and with man himself have been depicted on Class I Pictish symbol stones representing the constellations of Pisces, Cygnus, Auriga, Canis Minor, Aquila, Leo, Osa Major and Orion, perhaps the other constellations whose heavenly form is not so easily recognised also have images of their owners associated in some way with the carved images that have been used to portray them.

The Pictish calendar at the time of carving the Class I Pictish Symbol Stones

The first approach to determining the likely festival days in the Pictish calendar involved the examination of the most frequently occurring Pictish symbols and then determining the days when the brightest stars in the constellations identified with the symbols aligned due South in the sky at Civil twilight either at dawn or dusk. This gave us the suggestion of a calendar that shared its appearance with the Wheel of the year calendar with the appearance eight evenly spaced spokes around the wheel representing the eight major festivals celebrated in pre-Christian times by the Gaels and also described as a Wiccan calendar. Examining the Wheel of the year calendar, the year was divided into eight festivals, four major fire festivals known as Samhain, Imbolc, Beltane and Lughnasadh. And Four other festivals bisecting these festivals, Yule, Ostara, Litha and Mabon. The two most important festivals were Samhain and Beltane, Samhain celebrated the beginning of winter at the end of October and beginning of November whilst Beltane celebrated the beginning of Summer at the start of May. It is interesting to compare the dates that these festivals are celebrated and to compare these dates with the dates found for the Pictish stellar deity festivals some 4000 years ago.



It is interesting that the dates of the festivals coincide so closely with each other and given the original festival days were celebrated by the alignment of special bright stars on the days of the festival, the calendar dates when these alignments occur changes over time so that when festivals became date based, the association between the stellar alignments and the festivals was lost. The festivals can be examined to see whether the deities and their associations being celebrated have any connection with the ancient stellar alignments on those festival days.

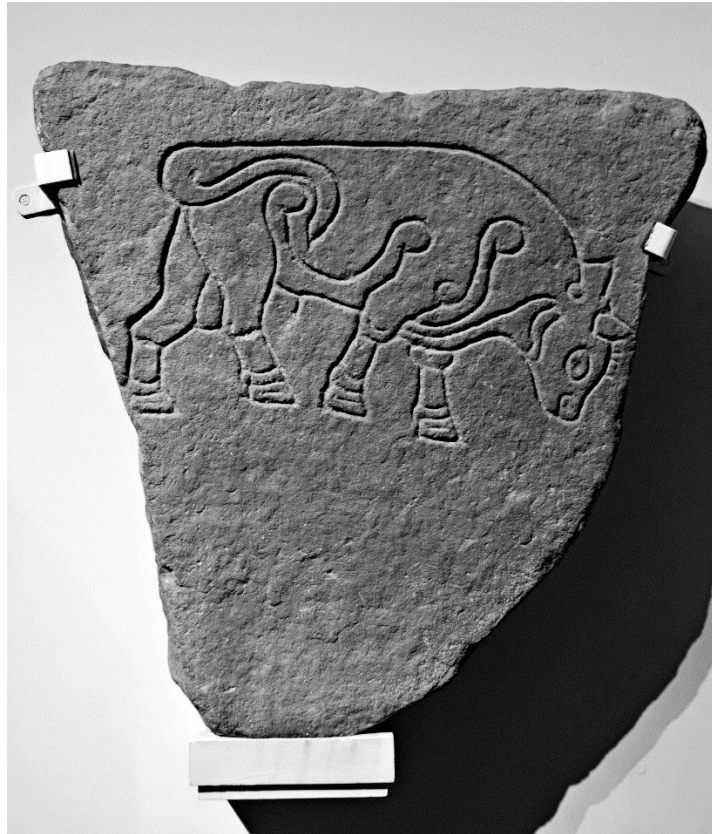
The four major fire festivals were Samhain, Imbolc, Beltane and Lughnasadh. Two of these four festivals can be identified by the Pictish symbols known as the Tuningfork for Imbolc, the End of Winter Festival and the Mirror and Comb for Beltane or Summer Festival. Although the days when the other festivals occurred can be estimated by the distribution of the eight festival spokes on the wheel of the year, the identity of the Pictish symbols associated with these other two main fire festivals is not obvious and more particularly the deep space objects used for alignment purposes to mark these festival days.

Imbolc

Today celebrated on the 2nd February was celebrated on what we would call February 4th though of course this labelling of date would not have occurred at that time and it represented the End of Winter Festival. The festival of Imbolc celebrated the festival of Bride or Brigid, now called Bridget. It was a fire festival and may have involved the cleansing, healing and purification ritual of animals by smoke and fire. There is a carved stone on the tower at Glastonbury Tor that depicts Brigid milking a cow.



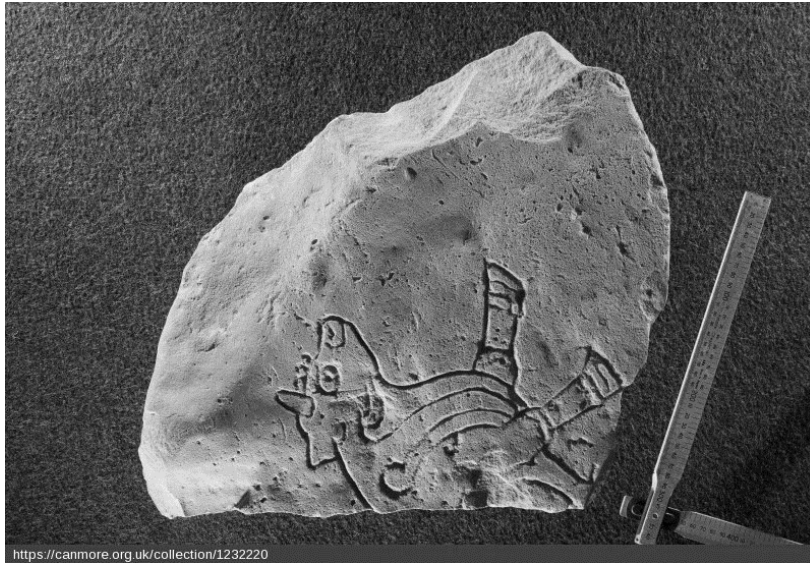
Cattle were considered very important in ancient times and they were seen as a symbol of wealth and power and used as currency. In her own livestock Brigid kept two royal cattle called Fea and Feimhean. There is evidence to suggest in Orkney that in Neolithic times cattle were led between two bonfires on festival days to purify them. It is perhaps appropriate therefore that the Pictish symbols associated with the festival on the 4th February, the End of Winter festival is the Tuningfork and the Bull both representing the constellation of Taurus, the former based on the pattern of stars in the constellation and the latter with the animal identified with the constellation. It is also interesting that Brigid is associated with healing and perhaps the representation of Taurus as a tuningfork may have some relevance as an ancient healing tool as it does today in alternative medicine. The End of Winter festival in Pictish times was marked by the alignment of Lambda Tauri the End of Civil Twilight.



Pictish Bull from Burghead



Reflection of Burghead Bull reveals Brigid with her Plucked Eye decorating her Crown of Light. It also appears that Brigid is feeding two dogs and is wearing her magic cloak.



Burghead 6 Pictish Stone fragment



Reflection of Brigid from Burghead 6 fragment.

The candles on Brigid's Crown of Light are clearly visible as the ears of two dogs decorating the crown and the eye which she plucked from the socket to make herself less desirable to an unwanted suitor is clearly seen like a jewel at the front of her crown. As far as Brigid's association with dogs is concerned, there is an ancient story about the time a guest came to her father's house and she began boiling a fitch of bacon cut into five pieces, for the meal. However, a hungry dog was attracted by the smell and Brigid in her

compassion gave it a fifth of the bacon, but the animal was not satisfied by this and so she gave it a further fifth. This was observed by the guest who told her father on his return what she had done. Her father then went to the pot and counted the pieces and there were five. The guest said he had seen her give away two pieces so there could not possibly be five remaining but her father calmly replied that this was just another example of a miracle that Brigid had performed.



Dunrobin Pictish Stone with Tuning fork Symbol

When the constellation of Taurus is represented by the Tuning fork symbol, as opposed to a Bull symbol, the symbol may represent Brigid as the tuning fork may have been an instrument of healing using sound. The association with Taurus is two-fold, with the pattern of the tuning fork resembling the pattern of stars in Taurus and when the handle is observed, it appears to take the form of a bull's head with horns.



Beltane

This festival celebrated on 1st May today was celebrated as the Summer Festival on May 6th or 7th around 1200BC. Beltane was, alongside Samhain, the most important fire festival and involved a springtime optimism that celebrated fertility with the increasingly sunny warm days. Wells were visited at Beltane and people would pray and leave offerings at the well. Water taken from a well at Beltane was considered as particularly powerful as was the morning dew and at dawn maidens would wash their faces in the well water and roll in the dew to increase their attractiveness and maintain youthfulness. It is interesting that there are many wells in Scotland whose names refer to Nine Maidens. The Pictish symbols identified with Beltane or the Start of Summer Festival are the Mirror and Comb. The Mirror is believed to represent the constellation of Virgo whilst the Comb is the constellation of Coma Berenices. It is perhaps appropriate that Virgo the mother goddess is associated with a festival of fertility but the alignment of stars indicating the precise day of celebration is not with Spica but the brightest star Alpha Comae in the constellation of Coma Berenices, lying directly above Virgo. There is a group of nine closely packed stars in Coma Berenices called Mel 111, perhaps this stellar object is the origin of the mythology associated with the Nine Maidens and other stories involving nine hazels for instance.

The End of Winter Festival and the Start of Summer Festival can be seen to have a reasonable association between the later known festival day deities and their associations and the earlier Pictish Symbol constellations and their alignments in the sky due South on those festival days. The remaining two major festival days traditionally occur around the 1st August and the 1st November. It might be expected that in Pictish times around 1200BC these festivals would have occurred at the same time perhaps a few days later than these dates based on the pattern with Beltane and Imbolc. Looking firstly at the festival of Lughnasadh or the End of Summer Festival, there is no constellation identified with a known Pictish symbol that appears to be aligned due South at either dawn or dusk.

It is difficult to imagine how the Pictish Mirror symbol representing the fertility goddess could be made to appear as a goddess given its simplicity of form and the consistent way it is represented on the Pictish stones. We have seen symbols being reflected in axes of symmetry to show the deity Brigid but can the same technique be used to reveal the goddess associated with the constellation of Virgo?



Drimmies Stone



Reflected, upside down image of lioness



Picardy Stone



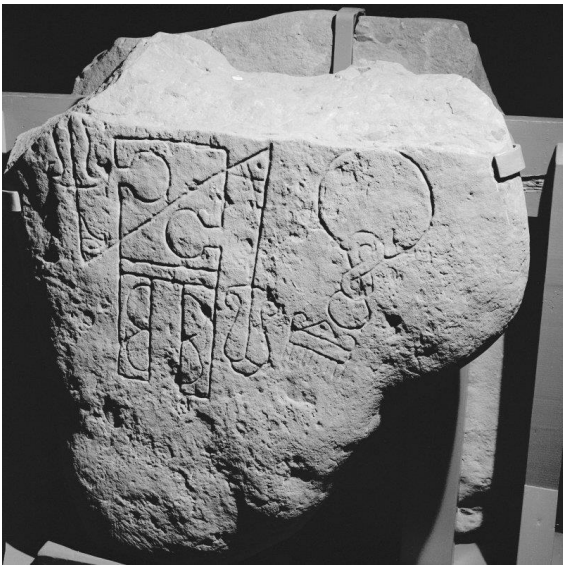
Reflected, upside down image of lioness



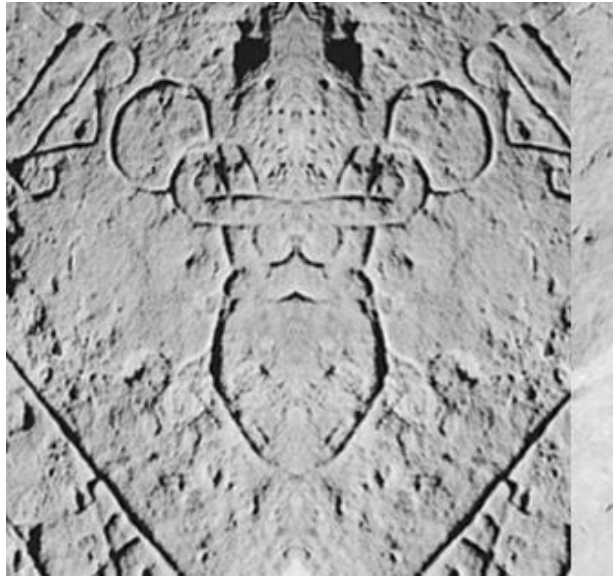
Aberlemno Stone



Reflected, upside down image of lioness



Clynemilton Stone



Reflected, upside down image of lioness

It may seem strange that a goddess of fertility would be represented by a lioness image but when we look at a stone from Rhynie the identification of the goddess becomes clear.



The "Rhynieman" stone from Rhynie in Aberdeenshire



Rhynieman converted to the Lioness Headed Goddess Sekhmet (Central Figure) by reflection.

The goddess appears in Scotland as the Ancient Egyptian goddess Sekhmet complete with pharaonic beard. It seems amazing that there is a connection between Scotland and Egypt and their belief systems around 1200BC.

Lugnasadh

The Missing Stellar Deity associated with the End of Summer Festival

When the festival dates were being determined based on the frequency of certain Pictish symbols being carved on stones and their association with their constellations, one of the eight festivals, that would have formed a wheel of the year was missing. The date of the missing festival could be estimated to be around August 5-6th.

When the night sky is examined for the 5th August 1200 BC the constellation of Capricorn is bisected by the line running due South at End of Civil Twilight around 1200 BC suggesting that this day could represent the festival day of a stellar deity associated with Capricorn. Unfortunately, there does not appear to be a Pictish Symbol associated with this constellation. However, there is a possibility that this constellation was very important to the Picts and their forefathers and that it was identified as the Great God and this may explain, contrary to what might be expected, its apparent absence from the Pictish symbols. The stars in Capricorn are not very bright and it may be that the star Gamma Sagittae of Sagitta, the Arrow lying directly above Capricorn could have been used as a precise marker for the festival day. On closer examination of the movement of Capricorn that this constellation may have been regarded as the guardian of the Sun during the winter months because at this time Capricorn rose and set with the Sun during the winter months and therefore had the unique property, amongst constellations, of never being visible in the winter night skies. The appearance of Capricorn when the stars are joined together has a triangular shape and although it is today identified as a fish-tailed goat it may have been associated with a different form by the Picts that was more relevant to the pattern of joined-up stars. There is a further clue to its identity from an ancient Mesopotamian clay artefact containing astronomical information written in cuneiform in the first millennium BC.



Figure 29 Alternative Pattern of Capricorn when its brightest stars are joined by lines. The possibility is that the constellation was interpreted as a Cats Head (with one eye and the missing eye supplied by the Sun)

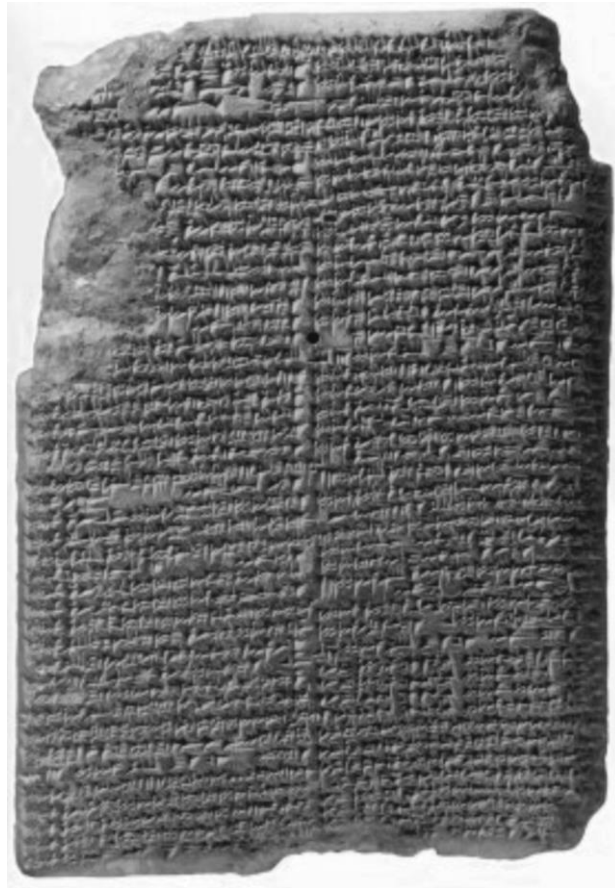


Figure 30 Mul Apin Cuneiform Tablet (687BC) detailing astronomical observations believed to date from around 1000-1400BC

'The Sun which rose towards the North with the head of the Lion turns and keeps moving down towards the South at a rate of 40 Ninda per day. The days become shorter, the nights longer....The Sun which rose towards the South with the head of the Great One then turns and keeps coming up towards the North at a rate of 40 Ninda per day. The days become longer, the nights become shorter.'

This ancient cuneiform text describes the rising Sun at the summer and winter solstices. At sunrise when the Sun is furthest North the Sun is described as rising with the head of the Lion. When we examine the night sky for the year 1000BC for the latitude of Baghdad we discover that the Sun rises with Leo the constellation of the lion.

When the night sky at dawn at the winter solstice is examined, looking towards the eastern horizon and the rising Sun, the following pattern is observed using Skymap Pro

II

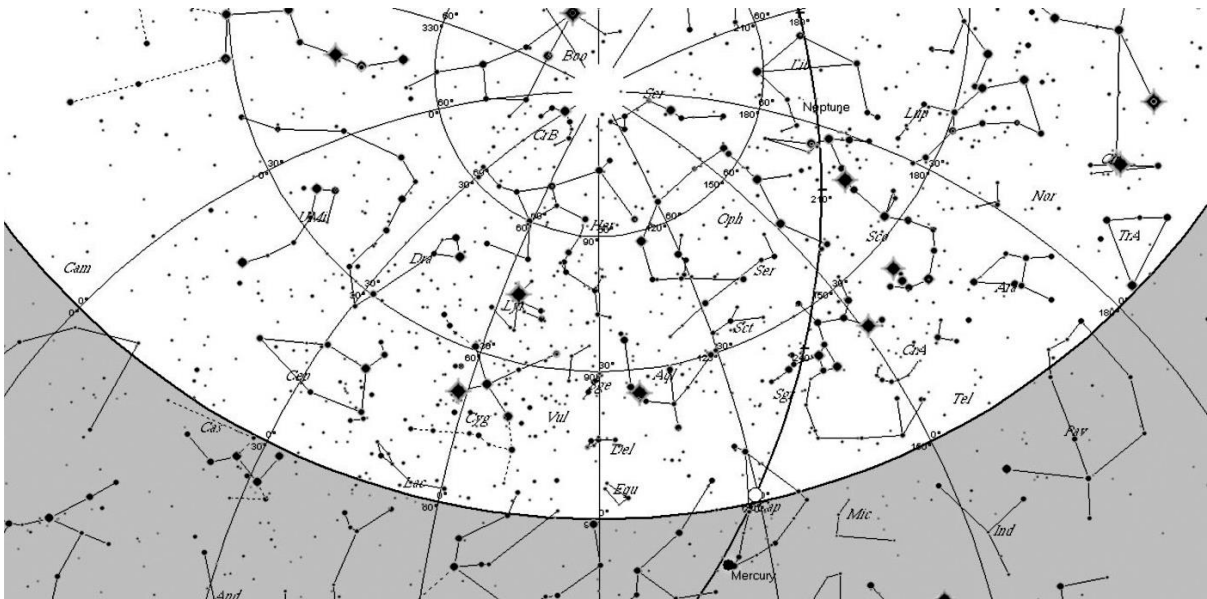
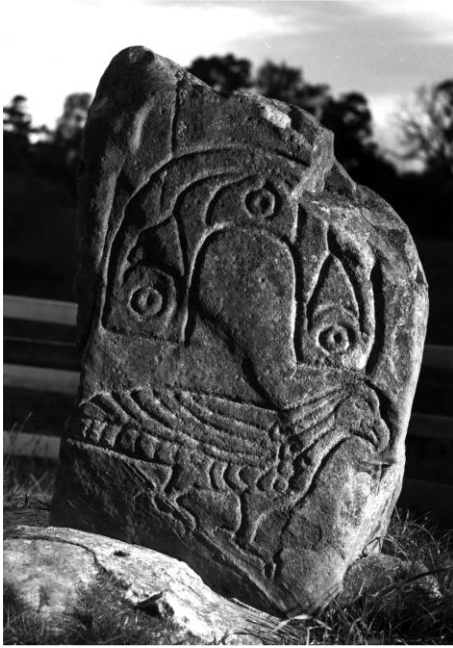


Figure 31
 Winter Solstice
 (29th December) 1000BC
 Baghdad

The Sun is seen to rise with Capricorn referred to in the text as "the head of the Great One". There is another clue in the text as it refers to both the head of the lion and the head of the "Great One". Whilst the pattern of stars in the constellation of Leo can be interpreted as being of leonine form with a head. Given the constellation of Capricorn appears to form a simple triangular shape there seems little reason to be able to find a head as a distinct part of the constellation and perhaps the whole constellation itself was identified as a head.

There is an ancient tradition that the image of the Pagan Great God was never represented and that his name was never spoken. For instance, in Phoenician temples there were no sculptures or paintings of the god Melkart ever displayed. Perhaps the Picts too followed a similar idea and on considering today's religions, it is interesting to note that although there are abundant images of Jesus, Mary, John and the disciples, there are no images of God nor Allah and perhaps this tradition of an almighty god that is beyond any physical identity comes from a very ancient tradition. On closer examination of the Pictish symbols very interesting hidden images can be revealed. It is widely known that mirrors are associated with trickery and that using a mirror to make reflections in patterns could allow someone to see what they wanted to see. However, a mirror can be used to make Cats heads appear from the Pictish carved symbols that have a certain convincing feline appearance and which often seem to share the generally triangular shape of the constellation.



Strathpeffer Stone where reflecting the carved pattern in an axis of reflection down the right-hand edge of the stone produces an image of what could be interpreted as a cat's head.



The Redland Stone where reflecting the carved patterns within the Crescent and V-Rod produces a cat's head



Easterton of Roseisle Stone



Craw Stane, Rhynie

The image of a reflected Cathead can be found in many of the Class I Pictish Symbol stones and going back further to the Recumbent stone circles the appearance of the recumbent stone flanked by two tall upright stones has the appearance of a cats head and given its position on the south west of the circle it coincides with the position of the setting Sun in the winter when the constellation of Capricorn also sets with the Sun perhaps emphasising the importance of the constellation as guardian god of the winter Sun. Examining the weathered recumbent stone inner faces reveals traces of what appears to be an eye on the stone circle known locally and intriguingly as "Stone Head".



Stone Head Recumbent Stone Circle, Aulton, Aberdeenshire



Reflected image of a cat's head still just visible after 5000 years of weathering. The "two" setting Suns above the stone result from the reflection carried out on the image

The Constellation of the Cathead

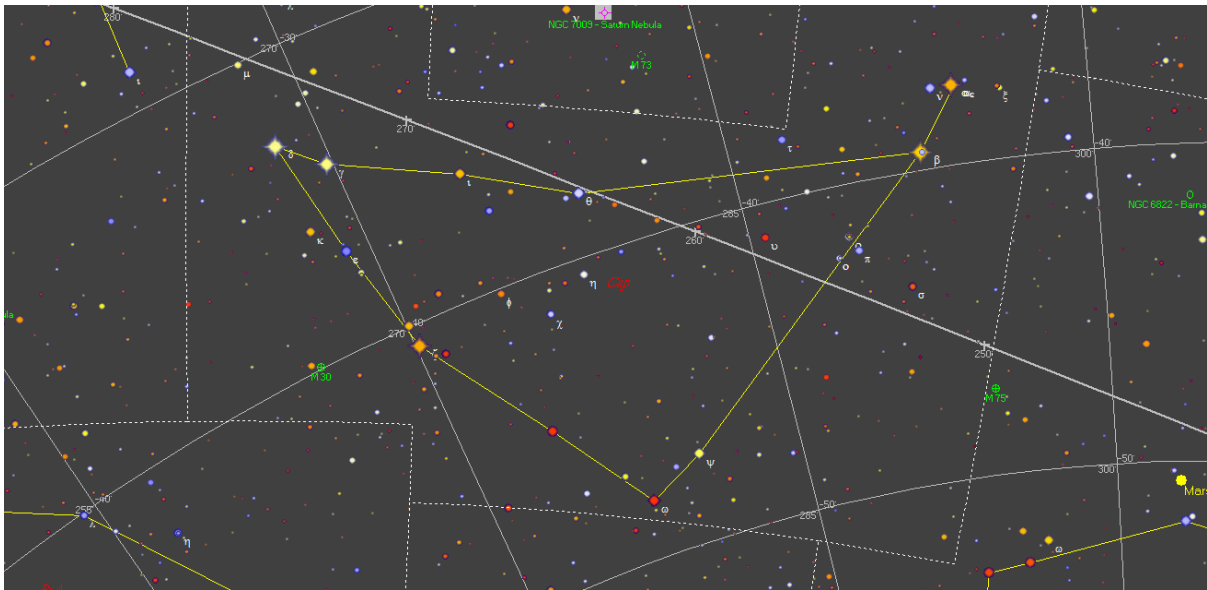


Figure 36 The constellation of Capricorn

The constellation considered by our ancient ancestors as the great god is likely to have been Capricorn whose conventional representation shares its appearance with the head of a Cat when its brightest stars are joined together with lines. Although the constellation is today associated with a fish-tailed goat, in ancient times in Scotland it may have been identified with a Cat's head. The reason why this constellation may have been regarded as especially important was that it was regarded as the guardian god of the winter Sun since during the winter months Capricorn was not visible in the night sky because it rose and set with the Sun and only reappeared in the night sky with the ending of winter. The "missing" festival day on the Pictish wheel of the year on August 6th has the constellation of Capricorn aligned due South at End of Civil Twilight. There are other references to Cats and worshipping a head that may provide additional supporting evidence for the unusual idea of the Great God being represented in such a way. Firstly there is the veneration of the Cat in Ancient Egypt that was considered so important that killing one was a crime punishable by death. In Scotland the Northern lands known as "Caithness" mean "lands of the Cat people". There is also the possibility that later on following the arrival of Christianity that certain groups continued to venerate the Cat head god in secret and there is evidence extracted during torture that the Templars may have worshipped "a cat's head" and templar seals which on the face of it appear to represent Christian symbols such as the lamb of God can be transformed using a mirror to reveal a cat's head. However if the importance of the constellation was related to its association with the Sun during the winter months this association was eventually lost over the millennia as the paths of the Sun and Capricorn parted company due to precession of the equinoxes first at southerly latitudes and later in the North of Europe, a phenomenon that may have

played an important part in looking for a new religion which was provided by the miraculous birth of Jesus Christ.

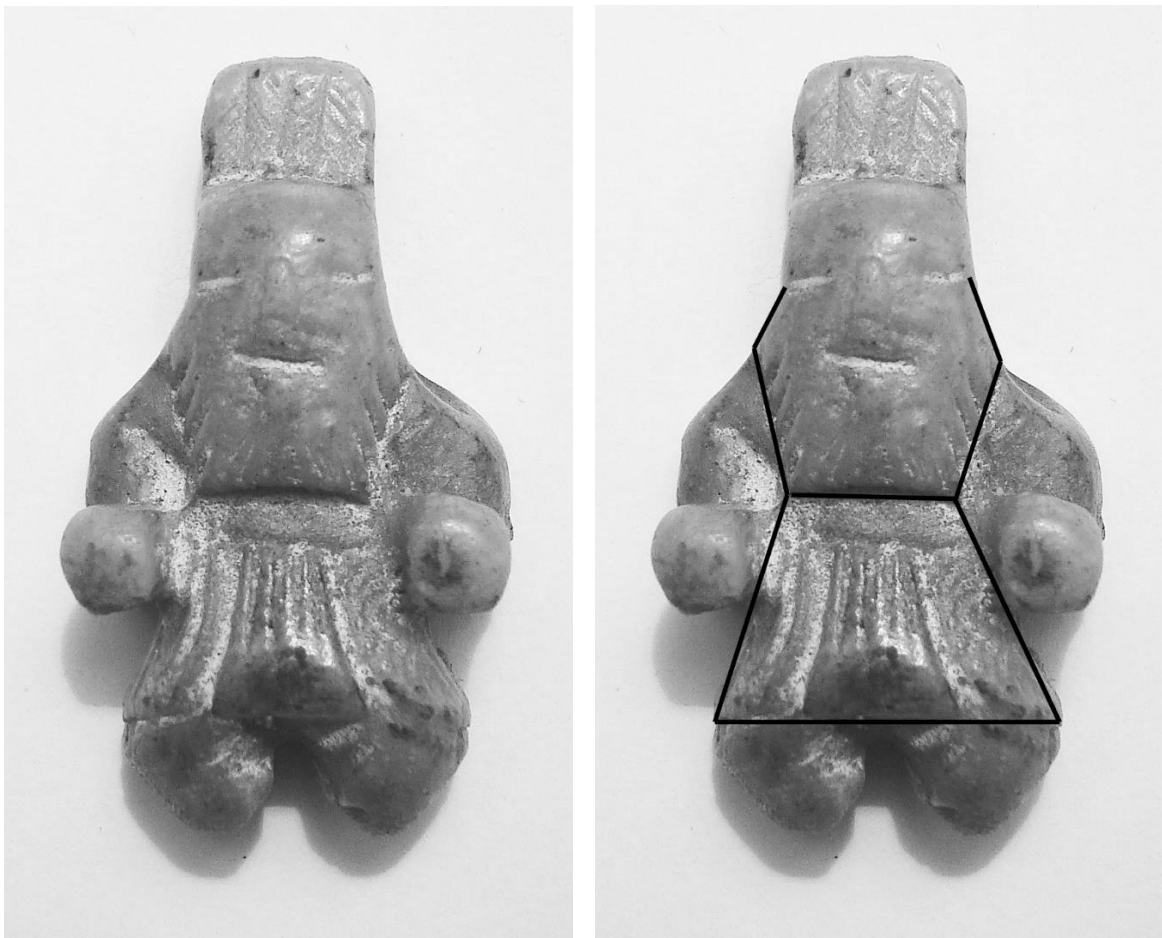
This analysis of alignment of stars in the constellations that have been proposed as being represented by the Pictish symbols has resulted in a calendar that when represented as the "Wheel of the Year" gives an even and almost symmetrical pattern of festival days for a date around 1200BC. A date that is in conflict with the currently accepted date for the carving of the Class I Pictish stones of around 600-800AD.

Samhain

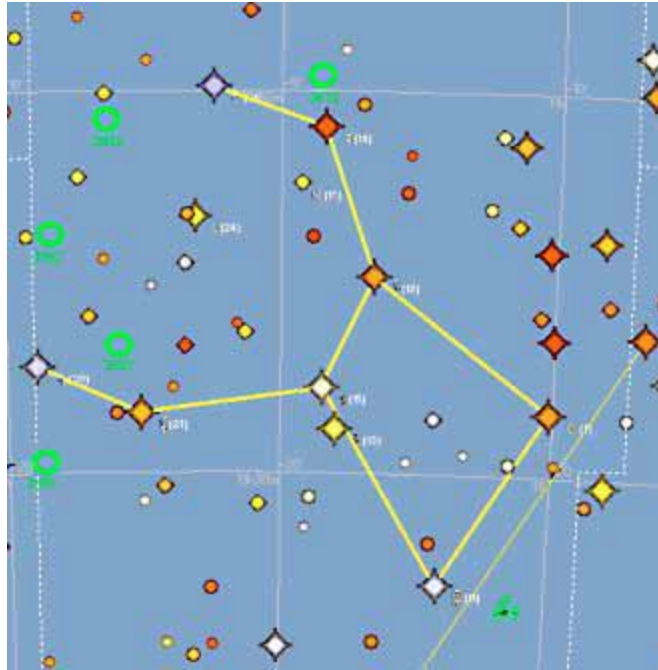
The festival celebrated at the beginning of November celebrates the start of Winter. Just as the Picts celebrated the night as the start of the day, they celebrated winter and the increasingly dark nights as the start of the year. Today we celebrate Halloween at approximately the same time. The festival of Samhain, alongside Beltane, represented one of the most important festival days of the year and perhaps given that Beltane was a beginning of summer festival associated with a Fertility Goddess and maiden deities, the festival celebrating the start of winter, lying directly opposite Beltane might be associated with a male deity of forgotten origin. Looking at the night skies around the beginning of November 1200BC it can be seen that the constellation aligning due South at the End of Civil Twilight is Aquarius represented by the Picts as "the Flower" symbol, a kelp-like representation. Perhaps the kelp was symbolic of the practice at this time of year when the first winter storms washed up tons of seaweed on the beaches which was gathered by the people in stacks to feed cattle through the winter and used to fertilise the soil on their strips of land. The constellation appearing due South at the Start of Civil Twilight is the small constellation of Crater. Perhaps this small constellation riding on the back of Hydra, the Great Serpent may at first appear as unlikely to represent an important deity as a constellation represented by a piece of seaweed but the importance of Crater in prehistoric times can be unravelled when we examine the identity of star gods venerated in Ancient Egyptian and Phoenicia. The God Bes was represented by a dwarf-like, grotesque, cat-like deity that was an extremely important deity in Egypt and Phoenicia originally credited with protecting people from poisonous snakes. The association of Crater with Hydra seems like an appropriate one as the constellation stands on the back of the Great Serpent with his stellar arms raised aloft. As the paths of the Sun and the constellation, Capricorn representing the Cat-head deity Bas parted due to precession of the equinoxes, The popularity of Bes increased with the passing centuries and from his origins as a god protector with powers against snakes, he came to take on the mantles of god of dance, music, marriage, carnal love and childbirth. In time this unlikely god's influence expanded to form his own triad with his female counterpart Baset and a child Bes that eventually supplanted the importance of Osiris, Isis and Horus and remained the last bastion of the old stellar based religion against early Christian evangelism in Egypt. With the arrival of Christianity into Northern Europe in the middle of the first century many of the ancient popular gods and goddesses were "rebranded" as Christian figures. This process played an important part in persuading people whose forefathers dating

back over thousands of years, who had believed in a pantheon of stellar gods that could be seen in the night sky and whose veneration had served the people well, that the new religion was relevant to their forefather's beliefs. Many hundreds of thousands of small amulets of Bes made in blue faience, stone or terracotta and worn around the neck still survive today. The association with the constellation can be clearly seen in the shape of some of the amulets, particularly from Phoenician colonies such as Ibsim, "the Island of Bes" now called Ibiza in the Balearic Islands. Ibiza got its name from the Carthaginian migrants who inhabited the island around 600BC due to the unusual complete lack of snakes on the island. The red earth of the island was believed to have been blessed by Bes and prevented snakes from being able to live there and as such the Carthaginians and later Romans carried amulets containing Ibizan soil with them wherever they went to spread on their land to protect them and their families from snakes and used terracotta drinking vessels made from Ibizan clay that they believed would protect them from poisoning.

The design of this Bes pendent from Ibiza from around 600BC reflects the characteristic shape of the constellation of Crater. The five feathers in the headdress of Bes are likely to represent the five galaxies in the constellation.



Amulet of Bes from Ibiza with pattern of Crater superimposed on right side image



Constellation of Crater with Five Galaxies shown as Green Circle

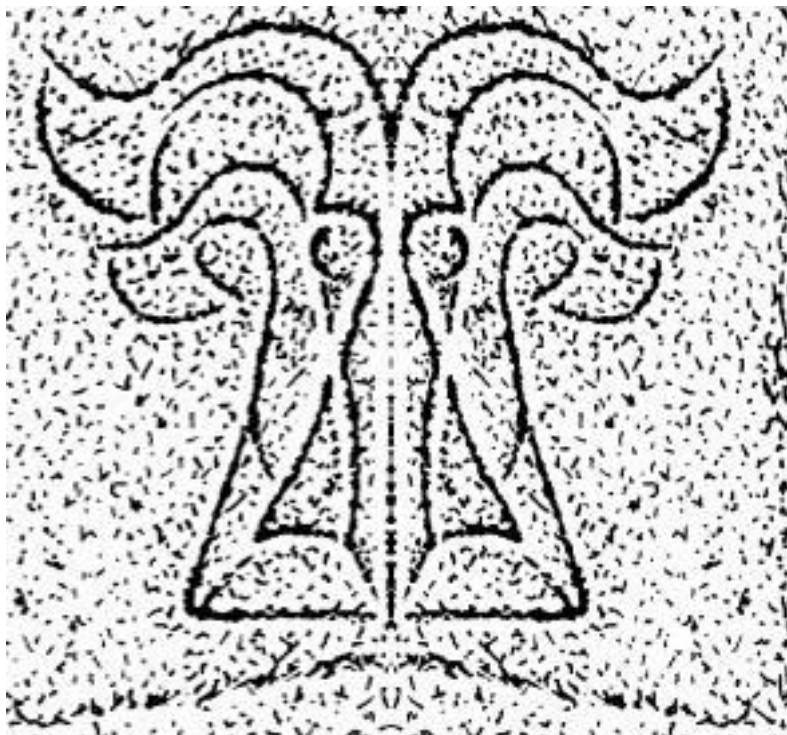
The constellation identified with Bes like so many other pre-Christian deities later became rebranded as stellar deities representing saints, though of course it was the festival that was syncretised into the new religion rather than the star group and eventually with time the alignment of the stars moved away from the festival day as the calendar was now a date based fixed calendar that bore no relationship to the pattern of stars in the sky.

It is fascinating that in the British Isles three of the countries have saints associated with snakes or serpents of some kind. St Patrick in Ireland is credited like Bes, millennia before with clearing all the snakes from the land, whilst England's patron saint is credited with slaying another serpent-like creature in this case a dragon.

In the case of Scotland, Bes became identified with Saint Columba a missionary credited with bringing Christianity to the Pictish kingdom. Adomnan reporting a century after the Saint's death that Columba visited Loch Ness in the sixth century and chased off not a snake but an even more fearsome serpentine creature, the Loch Ness monster, "Nessie" herself, or the constellation of Hydra, the Water Serpent, raising his arms into the sky and making the sign of the cross, invoking the power of the "true" God thereby successfully banishing the monster and saving the life of a Pict who had been swimming across the Loch to collect a boat from the opposite shore.

So perhaps we might consider that the alignment of Crater at the Start of Civil Twilight marked the Start of Winter Festival or Samhain in Pictish times. The star Beta Crateris is aligned due South on November 5th around 1100-1200BC at start of Civil Twilight. There is one more consideration, whilst the goddess representing Virgo was represented by a Mirror symbol and Bride by a Bull symbol or a Tuning fork symbol, the gods

represented by the constellations of Capricorn and Crater are not represented by any identifiable Pictish symbol. The use of a mirror reflection of patterns carved in different Pictish images converted them into a Cat-head deity that is likely to represent the constellation of Capricorn but how might have the god associated with the Start of Winter festival have been represented? The Pictish flower symbol representing the constellation of Aquarius is aligned due South at the start of Civil Twilight on November 5th, the same day when Crater is aligned due South later on that day at the end of Civil Twilight. Perhaps, as in the case of the Cathead the deity associated with Crater could not have his image directly represented. The idea is that, like Capricorn, a half image of the god may have been portrayed as part of another Pictish symbol that could be revealed using a mirror. The most likely Pictish symbol that may have been decorated with a half-image of the deity associated with Crater is the Flower symbol, Aquarius that is a marker for the same day. Two Class I Pictish symbol stones have well carved Pictish Flower symbols, the stone from Dunnichen and the stone from Pabbay. Both symbols have a slightly awkward detail carved in their patterns, namely a circular ring and a straight left hand side vertical edge. If the flower symbols are reflected using the straight left hand side edge as the axis the following images are obtained. Heads appear which have horns and eyes that share a similarity of appearance with a carved Celtic deity from Ireland known as Crom Cruach or Crom Dubh.



Reflected image of the Deity associated with the Start of Winter from the Pictish Stone from Pabbay



Refelcted image made from the Dunnichen Pictish Class I Stone

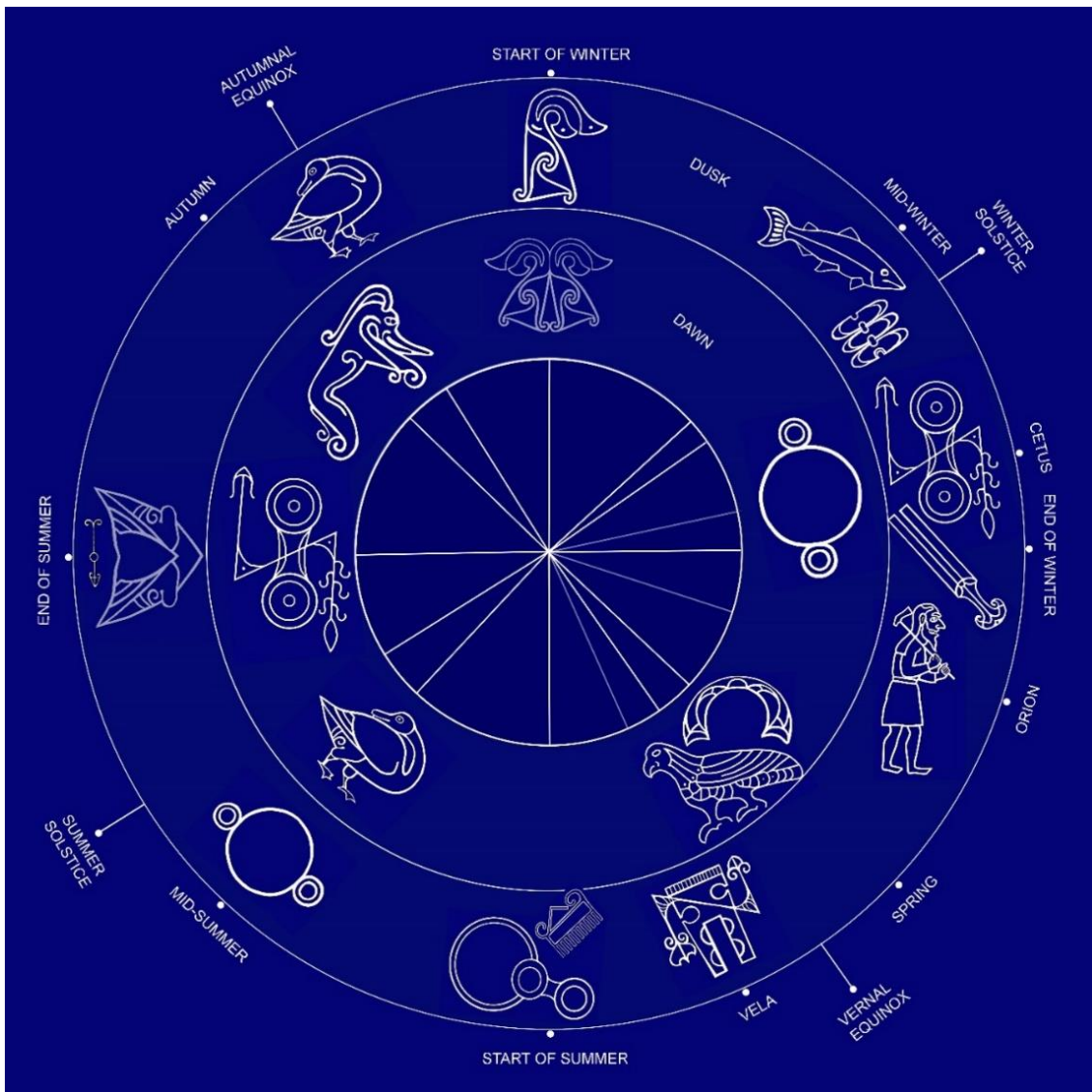
The reflected symbols as in the case of Capricorn, assumes the same shape as its associated constellation, Crater.

It is incredible that these stones allow us to reveal the deities venerated by the Pictish ancestors some three thousand years ago. It is perhaps even more incredible that despite not telling us the names that the Picts gave to these deities, these stones allow us to look at the very faces of the deities associated with the four major fire festivals of what was The Start of Winter Festival, The End of Winter Festival, The Start of the Summer Festival and the End of Summer Festival. Festivals that later became Samhain, Imbolc, Beltane and Lughnasadh.

The dates of the Pictish festivals can be summarised together with the stars aligned on these festival days used as markers for these festivals.

Festival	Day of Festival (1100-1200BC)	Deep Space Object Aligned on Festival Day	Start or End of Civil Twilight
Start of Winter	5 th November	Beta Crateris in Crater	Start
Mid- Winter	22-23 rd December	Gamma Pegasi in Pegasus	End
End of Winter	4 th February	Lambda Tauri in Taurus	End
Spring	20 th March	Sulafat in Lyra	Start
Start of Summer	6-7 th May	Alpha Comae in Coma Berenices	End
Mid-Summer	19 th June	Deneb in Cygnus	Start
End of Summer	6 th August	Gamma Sagittae in Sagitta	End
Autumn	19-20 th September	Gamma Monocerotis in Monoceros	Start
Cetus Festival	23 rd January	Gamma Ceti in Cetus	End
Orion Festival	23 rd February	Betelgeuse in Orion	End
Vela Festival	12 th April	Mu Hydrae in Hydra	End

The constellations aligned due South at Civil Twilight, both at dawn and dusk can be depicted on a Wheel Calendar. In this way the whole of the year and the festival days punctuating it could perhaps be visualised and committed to memory. Although the solar festivals consisting of the winter and summer solstices and the vernal and autumnal equinoxes are based on the position of the Sun on the horizon at sunrise and sunset, the alignment of stars on these festival days has been included for the time around 1100-1200BC when the Class I Pictish symbol stones were carved. The winter solstice coincides with the alignment of the Andromeda Galaxy at the end of civil twilight, the spring equinox coincides with the alignment of Altair the brightest star in Aquila, "the Eagle" due South at the start of civil twilight, the summer solstice does not coincide with a major constellation and star being aligned due South at dawn or dusk but Spica, the brightest star in Virgo, is aligned due West at the end of civil twilight on that day. The Autumnal equinox coincides with the alignment of Deneb, the brightest star in Cygnus, "The Goose" symbol due South at the end of civil twilight.



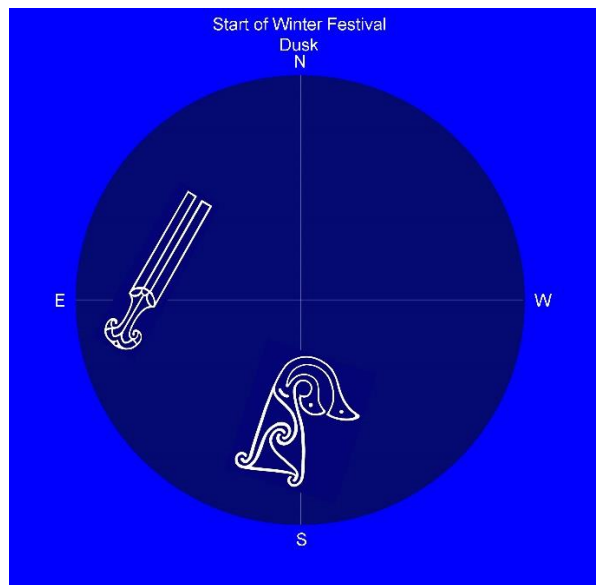
Pictish Calendar Wheel of the Year

The alignment of Constellation Symbols due South at Civil Twilight at Dawn and Dusk are shown for the stellar and solar festival days of the year. The alignment of Beta Crateris in Crater at Start of Civil Twilight on the Start of Winter Festival is shown by the opaque image of the Crom Cruach also known as Crom Dubh or Samhain which is obtained by a reflection of the Pictish Flower symbol.

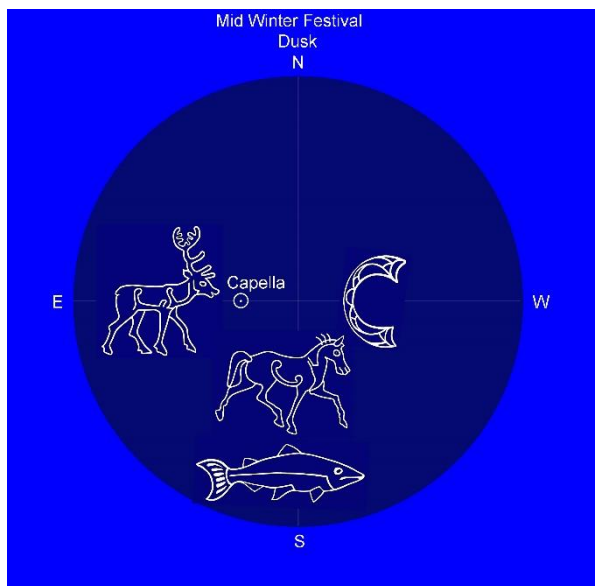
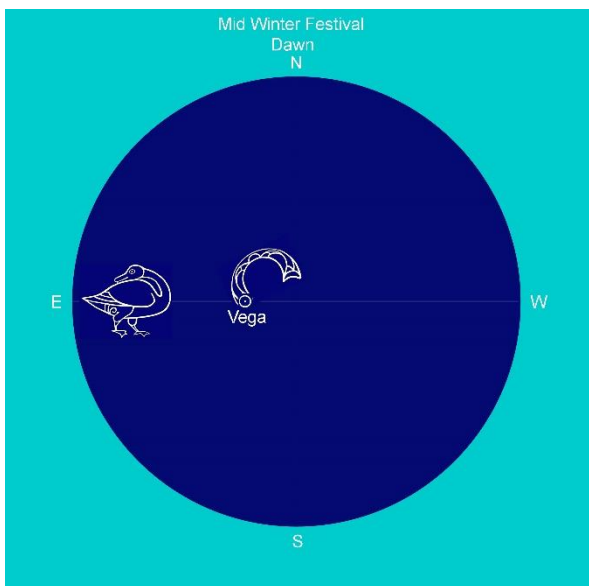
The End of Winter festival is marked by the alignment of Gamma Sagittae in the constellation of Sagitta, "the Arrow" at the End of Civil Twilight, lying directly above Capricorn, the Guardian of the Sun God represented as the Cathead God that is also represented as an opaque image made by reflection in this case from the Goose deity (constellation of Cygnus) but also concealed within many of the other carved symbols.

The wheel of the year showing the constellation Pictish symbols positioned due South at Civil twilight both at the start of civil twilight and the end of civil twilight is useful in focussing attention on the main alignments on each of the festival days however there are other constellations aligned due East and due West and due North on the festival days. Each festival day is individually depicted to show all the major cardinal alignments present at civil twilight.

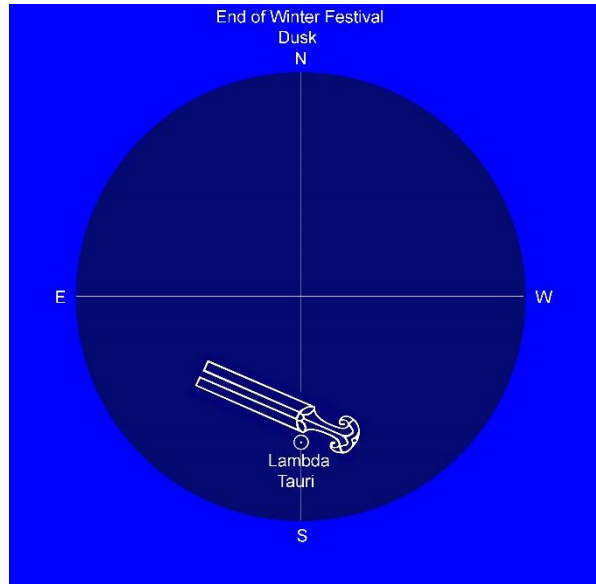
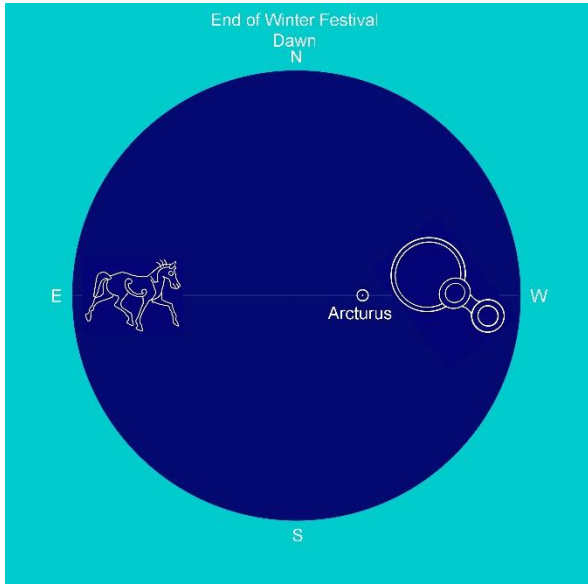
Alignment of Pictish Symbols/Constellations on each of the Pictish Festival Days at Start of Civil Twilight at Dawn and at End of Civil Twilight at Dusk



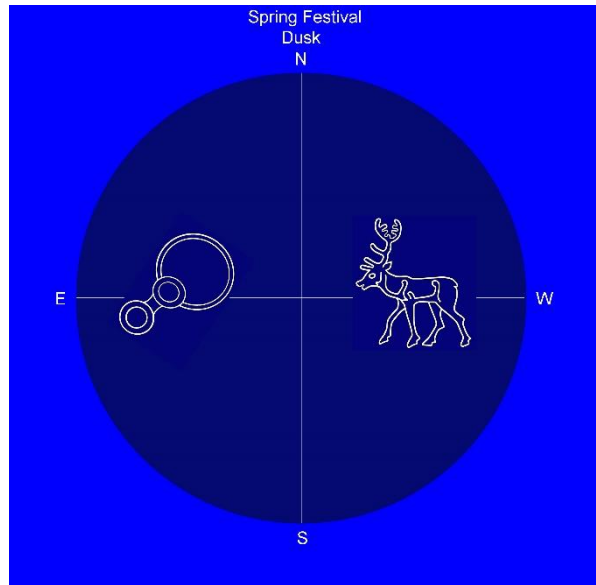
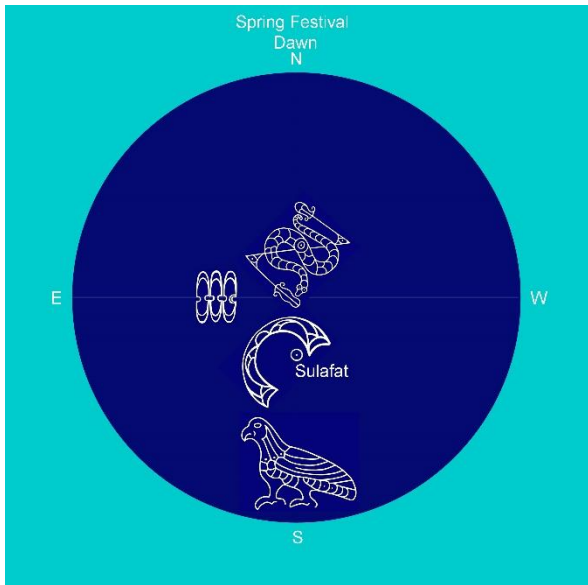
Start of Winter Festival November 5th 1200BC



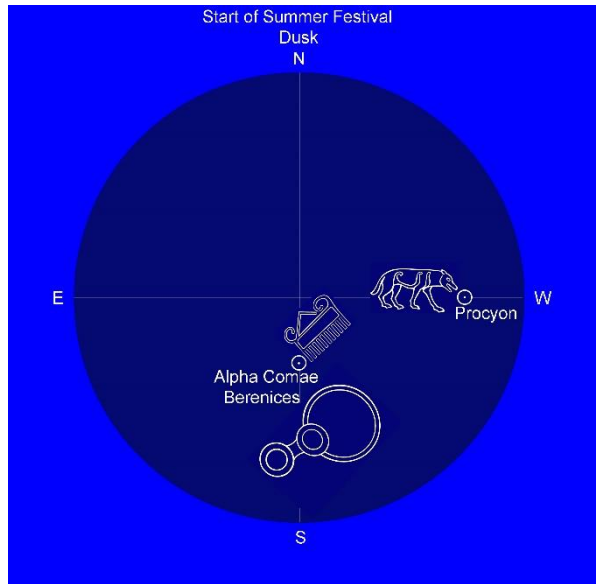
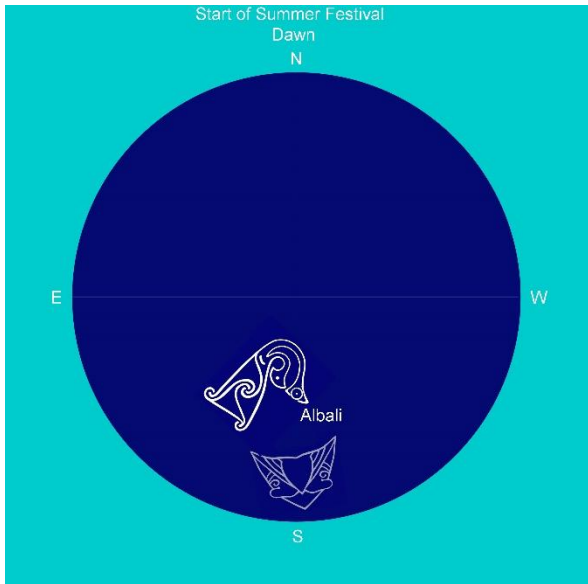
Mid-Winter Festival December 22-23rd December 1200BC



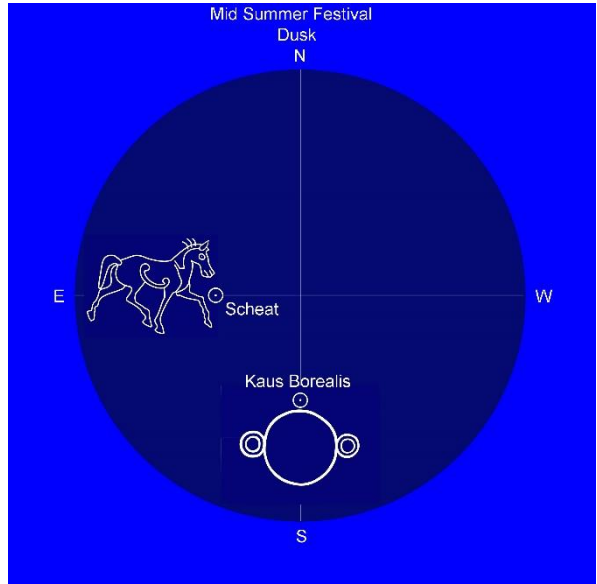
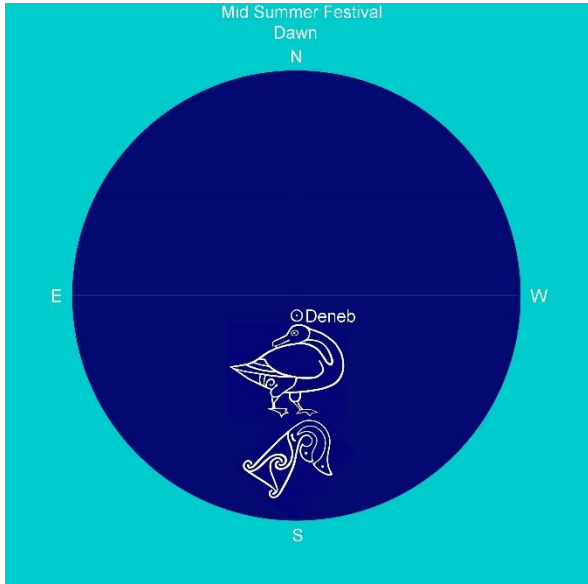
End of Winter Festival 4th February 1200BC



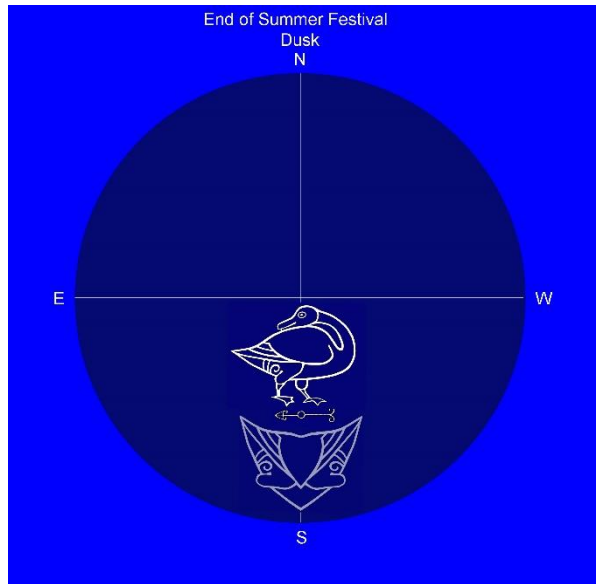
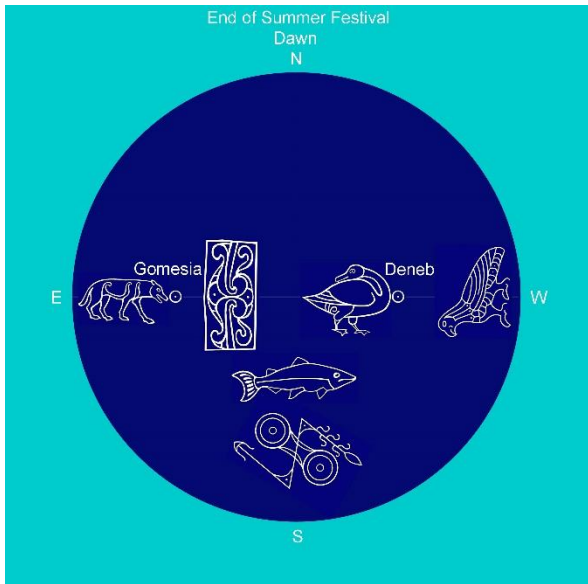
Spring Festival 20th March 1200BC



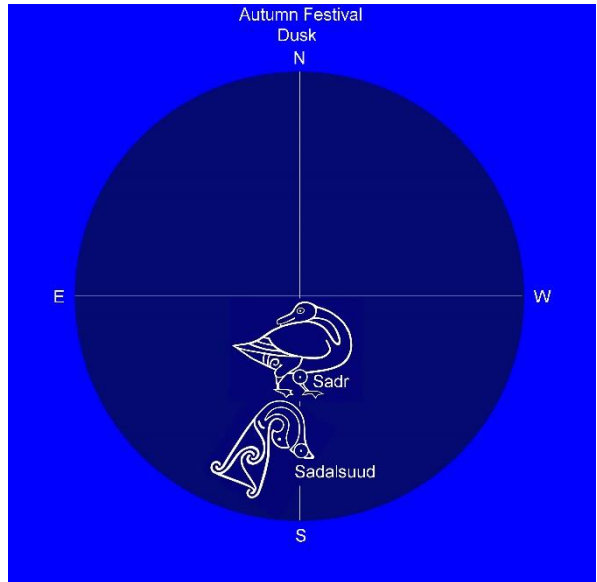
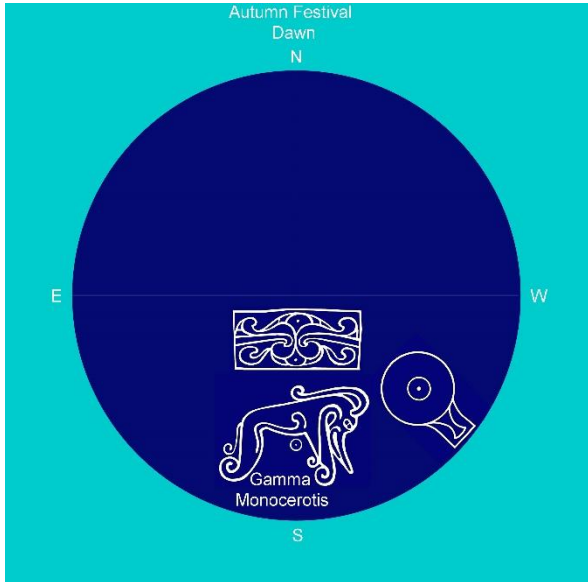
Start of Summer Festival May 6-7th 1200BC



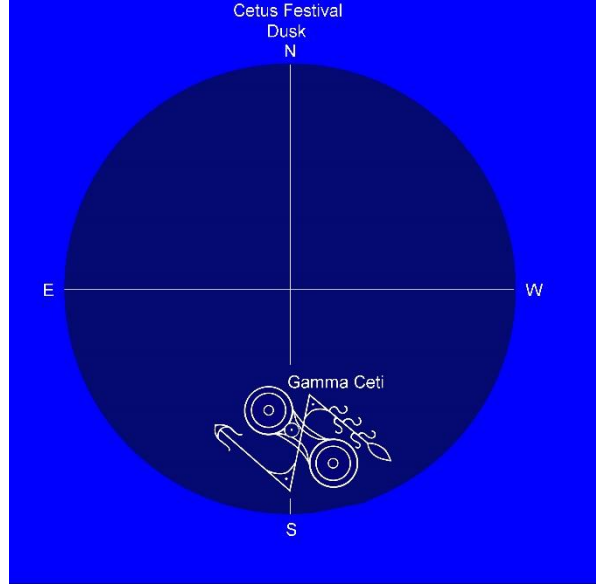
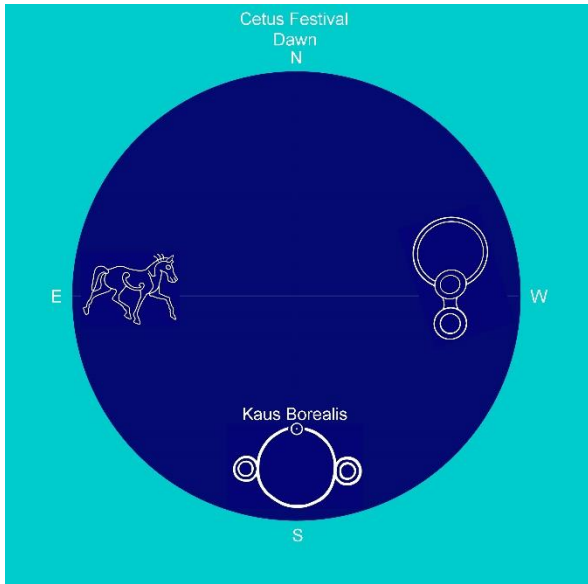
Mid-Summer Festival 19th June 1200BC



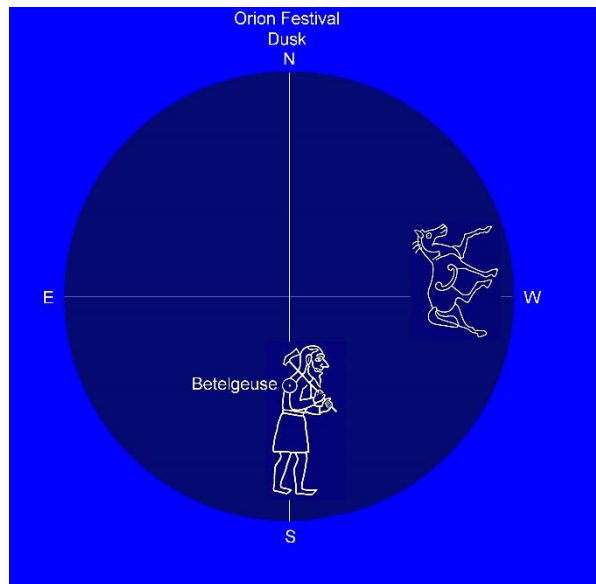
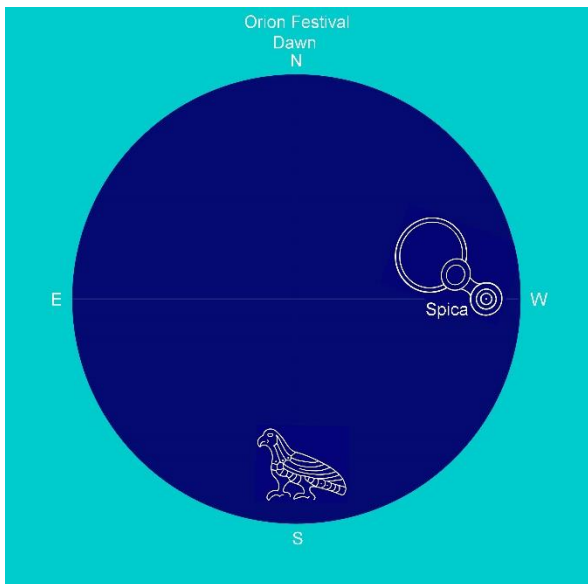
End of Summer Festival 6th August 1200BC



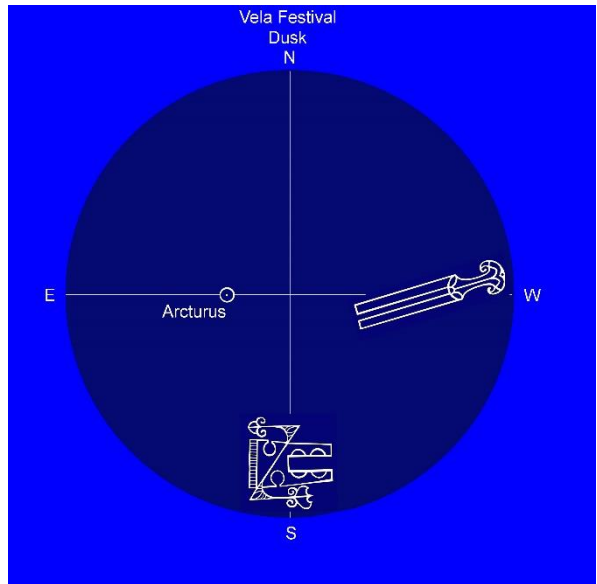
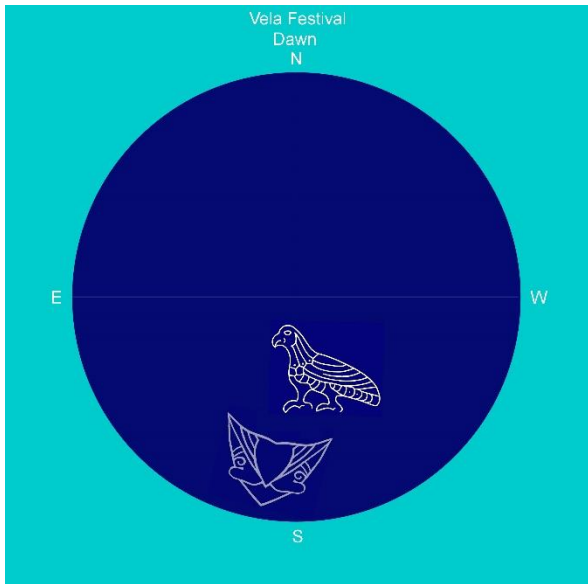
Autumn Festival 19-20th September 1200BC



Cetus Festival 23rd January 1200BC

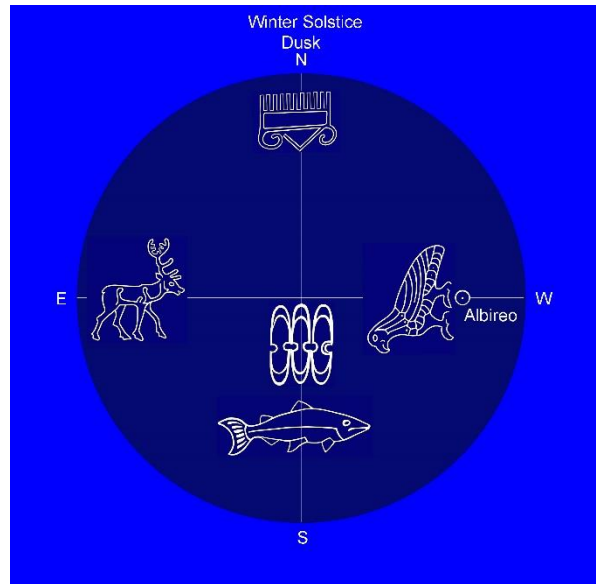
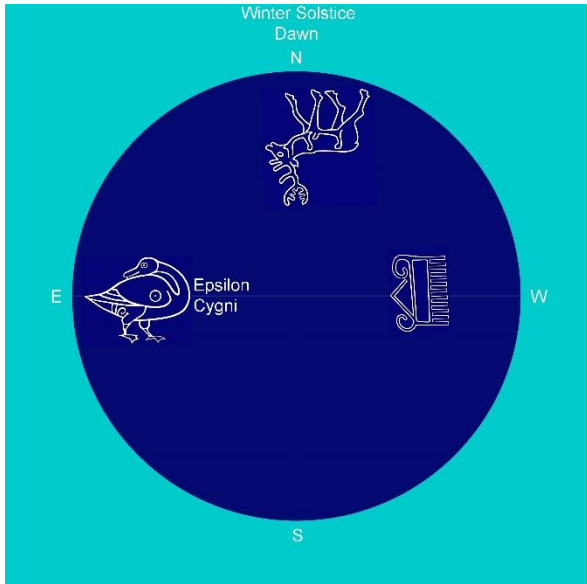


Orion Festival February 23rd 1200BC

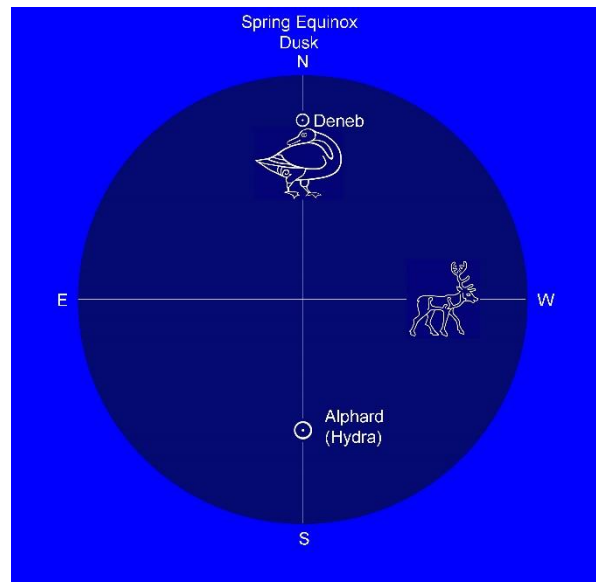


Vela Festival 12th April 1200BC

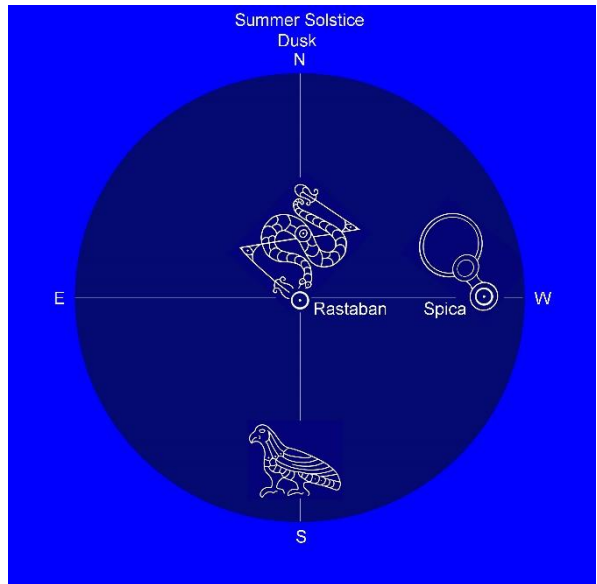
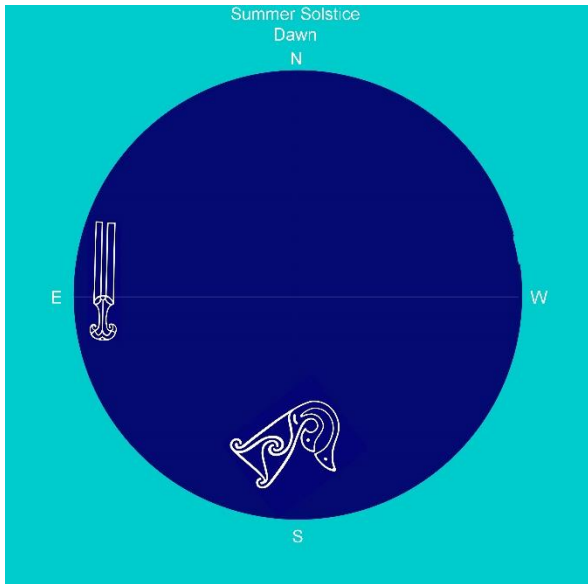
Solar Festivals



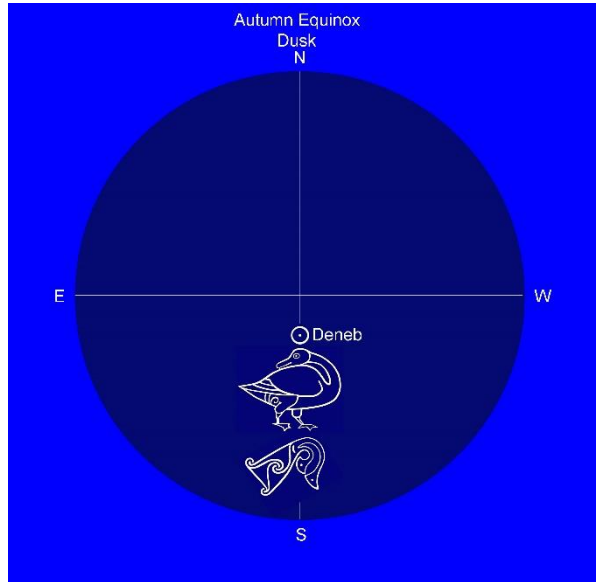
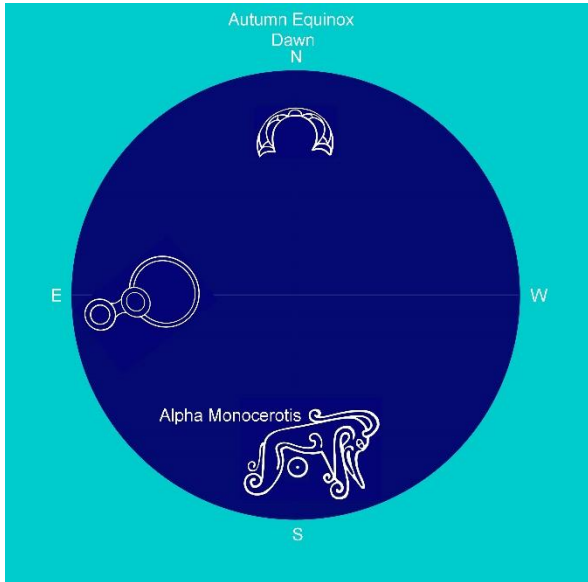
Winter Solstice Festival 31st December 1200BC



Spring Equinox Festival 1st April 1200BC



Summer Solstice Festival July 4th 1200BC



Autumn Equinox Festival October 3rd 1200BC

Conclusions

The Pictish Symbols are consistent in their appearance and identification with the patterns of stars we call constellations. The groups of stars represented as carved symbols are likely to have been considered by the Picts who carved them as stellar deities and together, they may have formed a pantheon of gods that were venerated for what the people believed they could deliver to them in terms of fertility, strength or a source of food for instance. The alignment of the Pictish constellation symbols and their brightest stars at civil twilight can be used to form a calendar of festival days dedicated to a particular deity and the pattern of distribution of these festival days is consistent with a Wheel of the Year-type calendar where the festival days are evenly distributed throughout the year. The festival days result in a pattern of eight stellar festivals and four solar festivals together with three additional stellar festivals dedicated to Orion, Cetus and Vela, the latter two constellations along with the constellation of Draco, containing star pairs that could be used to calibrate the Pictish pendulums, so vital to their measurement of distance and time. The date when the pattern of festivals is most evenly distributed corresponds to around 1100-1200BC. This date is far earlier than currently believed but is consistent with many features of the Class I Pictish stones such as the appearance of the Notched Rectangle as representing the constellation of Vela which was visible at this time in the night sky but which lay below the horizon at the date currently accepted and never rose above that horizon. Also in the case of the constellation of Cetus, the symbol has been carved so that it is decorated with 13 swirls around the two discs, that corresponds with the 13 Megalithic Degrees of separation of two stars in Cetus which could be used to calibrate the 58.25cm pendulum around 1200BC but not at the later time when for instance the same symbol portrayed on the Class II Pictish symbol stones was decorated not with thirteen swirls but either fourteen swirls (Aberlemno and Glenferness stones) or seventeen swirls (Rosemarkie Stone) corresponding to the angular separation of the stars pairs at the time these stones were carved Upsilon Ceti and Eta Ceti (14MD) Xi² and Zeta Ceti (8.5MD or 17/2 MD). The proposed early date of carving is also supported by the angle of the V-Rod in the Crescent and V-Rod symbols relating to the Andromeda galaxy, which can just be seen with the naked eye, which corresponds to the declination of the galaxy relative to the Celestial Pole around 1200BC for the Class I Pictish stones but the angle of the V-Rod carved on the later Class II stones, corresponding to the same galaxy, gives a declination that is consistent with Andromeda but for a date nearly two thousand years later, around 800-1000AD.

The Pictish symbols give us an incredible picture of Pictish life some 3200 years ago and an insight into the beliefs of the people and their technological abilities in observing the skies and measuring distance and time.

The interpretation of the Pictish symbols not just as constellations, but the realisation that major gods were represented as patterns of carving within the conventional symbols that could be revealed using a mirror to complete half images, has given us an even more colourful idea of the Pictish belief system and it is interesting to see how closely their very ancient calendar coincides with the Wiccan calendar and its similarity to the Wheel of the Year distribution of fire festivals.

It is also interesting how so few symbols hold so much information about the Picts and to consider how many written words would be required to convey the same amount of information.

The fact that we have even seen the strange otherworldly faces of their gods hidden in their carvings must make us ask what more information are these stones concealing that is yet to be discovered?