

A Systematic Re-evaluation of the Sources of Old Norse Astronomy

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Abstract

The field of Old Norse astronomy is in a very fragmented state. There is no primary source that describes all the heavenly bodies and constellations known to the Old Norse culture. Instead the researcher must go to a wide variety of sources, which sometimes only convey snippets of information. These sources range from Eddic poems to tales of early Icelandic astronomers and through to linguistic evidence, archaeology and folklore. The secondary material on these sources is also fragmented, since from the early twentieth century there have only been a few attempts at an overall grand narrative. In this paper a new approach is proposed to collecting and assessing this data. By using multi-disciplinary scholarship and a tripartite model, this paper will show how a new assessment of Old Norse astronomy can be put into practice for the twenty-first century.

Note on Old Norse terminology

For the ease of the general reader I follow the standard conventions for spelling Old Norse words. Accents are omitted, as is the consonantal nominative ending *-r*, except where it follows a vowel. The Old Norse consonants ‘þ’ and ‘ð’ have been rendered as ‘th’ and ‘d’, the vowels hooked ‘o’ and ‘ø’ as ‘o’, ‘œ’ and ‘æ’ both as ‘æ’.

Introduction

In calling this paper a re-evaluation of the sources of Old Norse astronomy, I am intentionally claiming three things; firstly that there is an Old Norse astronomy, secondly that there are sources for this and thirdly that I will re-evaluate these sources. To deal with the first of my claims, I would like to make the assertion that there was an astronomy that was used by the Old Norse cultural area.¹ Old Norse in this context is both the

¹ for an explanation of cosmological astronomy in an Old Norse context, see G. Sigurðsson, ‘Goðsögur Snorra Eddu: Lýsing á raunheimi með aðferðum sjónhverfingarinnar’ in *Rannsóknir í Félagsvísindum X Félags- og*

language and the culture associated with this language that flourished in Scandinavia between the eighth and thirteenth centuries. For the second claim this paper attempts to look into the source material. Thirdly I re-evaluate these sources in a methodical manner, so that I will finally be able to conclude whether we can truly see if there is a coherent Old Norse astronomy. There have been several articles recently that have dealt with Old Norse constellations which, although interesting, are somewhat lacking in an understanding of the source material that they use. This has led the authors to make some speculative judgments concerning possible constellations.² I hope that this paper, by looking deeper into the source material, can correct this. In this paper I have not dealt with Old Norse navigation as this has been dealt with extensively by Thorsteinn Vilhjálmsson.³

Sources for pre-Christian Scandinavian cosmology

Written sources about Old Norse mythology are almost always biased in some way, as almost nothing written survives in Scandinavia from the pre-Christian period aside from runic monuments which, unfortunately, do not tell us anything about astronomy. There are some contemporary Latin, Arabic and Byzantine sources for Old Norse religion, but they tend to focus only on observed ritual and not on the mythology behind the ritual. The first non-runic written sources from Scandinavia itself date from the twelfth century onwards and are from the Christian period. Of these Scandinavian sources the most detailed ones for pre-Christian mythology are the *Prose Edda* of the Icelandic Lawspeaker Snorri Sturluson (1179-1241) and the anonymous collection of Icelandic mythological poems known as the *Poetic Edda*. The name Edda has been ascribed to Snorri Sturluson and his prose work on mythology since at least the fourteenth century, and it became attached to the *Poetic Edda* in the seventeenth century. There have been many attempts to find a

Mannvísindadeild, ed. G. Þór Jóhannesson and H. Björnsdóttir (Reykjavík: Félagvísingastofnun Háskóla Íslands, 2009), pp. 851-863.

² See J. Ogier, *Eddic Constellations*, <http://www.roanoke.edu/forlang/ogier/EddicConstellations.html>; and J. Persson, *Norse Constellations*, <http://www.digitaliseducation.com/resources-norse.html>.

³ Þorsteinn Vilhjálmsson, 'Time-Reckoning in Iceland before Literacy', *Archaeoastronomy in the 1990s*, ed. C.L.N. Ruggles (Loughborough: Group D Publications, 1991); and Þorsteinn Vilhjálmsson, 'Time and Travel in Old Norse Society', *Disputatio* 2, (1997): pp. 89-114.

meaning for the word Edda but the most likely etymology connects it with terms for the composition of poetry.⁴

The Eddas

The *Prose Edda* was written c.1220 in four parts and is found extant in six medieval manuscripts, of which Codex Regius (GKS 2367 4to) from the fourteenth century is the most complete example. The first part is a prologue which views Old Norse mythology from a learned Christian perspective. The second part is called *Gylfaginning* ('Tricking of Gylfi'), in which the Swedish King Gylfi meets three mysterious strangers who tell him of the pagan Norse gods and the creation and destruction of the world. The third part is called *Skaldskaparmal* ('Language of Poetry'), and is a treatise on that subject which also contains further mythological tales. The final part is called *Hattatal* ('List of Verse Forms'), and is a treatise on the different types of verse used in poetical forms.

The *Poetic Edda* is found in its most complete form in another manuscript also called Codex Regius (GKS 2365 4to), this time dating from c.1270.⁵ The poems contained within possibly stem from tenth-century, pre-Christian Scandinavia or earlier, but as yet there is no satisfactory way to date them.⁶ The poems that concern the creation of the cosmos and evidence of stellar myth are *Voluspa* ('The Seeress's Prophecy'), *Vafthrudnirsmal* ('Vafthrudnir's Sayings') and *Grimnismal* ('Grimnir's Sayings'). In all three poems the main protagonist is Odin, the chief of the gods who wishes to acquire wisdom and knowledge. In *Voluspa*, Odin questions the Seeress on the creation and eventual destruction of the world. In *Vafthrudnismal* Odin engages the wise giant, Vafthrudnir, in a deadly wisdom contest in which the giant loses but not before he answers many questions on the creation of the world. In *Grimnismal*, Odin travels in disguise to the court of King Geirrod where he is captured and tortured by heat and thirst for nine days. During this torture Odin reveals much about the creation of the world as he enters a trance-like state before he finally unmask himself and predicts the doom of King Geirrod. The cosmic material found in these three poems and in

⁴ For a more detailed argument and history of the name see A. Faulkes, 'Edda', *Gripla* II, (1977), pp. 32-39.

⁵ Both Codex Regius manuscripts are held at Stofnun Árna Magnússonar í íslenskumfræðum in Reykjavik.

⁶ See *Poetic Edda*, trans. C. Larrington (Oxford: Oxford University Press, 1997), p. xi.

the *Prose Edda* is the subject of the next section, starting with the creation.

The Creation of the Heavens

In the beginning, according to *Gylfaginning*, there were two realms; one was Niflheim in the north, which was all cold and darkness, and the other was Muspellheim in the south, which was all heat and light. From Niflheim there flowed a series of poisonous rivers collectively called Elivagar. These rivers flowed into Ginnungagap, between the two realms, where they froze into layer upon layer of rime frost. The heat from Muspellheim melted some of this rime frost, and from the meltwater emerged the primeval giant Ymir and the cosmic cow Audhumla. From Ymir's sweat came the race of giants, and Audhumla licked the salt from the rime frost; from there emerged a man named Buri, whose grandchildren were the three gods Odin, Vili and Ve. For unknown reasons the three brothers later killed Ymir and dismembered him to create the world. Ymir's skull became the heavens and was supported above the earth on four dwarves.

Odin and his brothers took sparks from Muspellheim, and placed them in the sky to illuminate heaven and earth. Some of these lights became fixed and some moved in a wandering course ordered by Odin and his two brothers. Snorri mentions that ancient sources say that this is how days were distinguished and also how years were counted. In his prologue, Snorri also describes how people in the past knew about the heavenly bodies, and that they had various courses, some being longer and some being shorter than others. In *Voluspa*, the Seeress proclaims that at first the Sun, stars and Moon did not know where their place might be. The gods then gained power and set the heavenly bodies in motion; they also began time by naming the parts of the day that eventually reckon up the years.

Night and Day: The Sun and the Moon

After the description of the creation of the stars the Eddas then talk about the creation of Night and Day and the Sun and Moon. *Gylfaginning* relates how a certain Norfi or Narfi (Norr in *Vafthrudnismal*), had a daughter called Night. Her husband was called Delling and together they had a son called Day. Odin took Night and Day and gave them a horse and chariot each in which to ride through the sky. *Vafthrudnismal* also adds that the gods made the new moon and the dark of the moon in order to count the years for men.

In the separate myth for the Sun and Moon, a man called Mundilfæri has a boy called Mani (Moon), and a girl named Sol (Sun). The gods become angry at the impudence of his naming his children after the heavenly bodies, and so the children are set to the task of drawing the chariots of the Sun and Moon. *Vafþrúdnismál* says that they must pass through the sky every day to count the years for men. Sol's chariot is pulled by two horses; Mani steers the Moon and controls its waxing and waning. *Grimnismál* also refers to the Sun as the 'shining god', whilst the Moon is referred to as the 'bright bride of heaven'.

It would appear that there are two versions of the myth here: in one version the night is female and the day is male, and in the other the Moon is male and the Sun is female. In both versions the Sun and Moon are drawn by chariots, but the number of horses differs. It is important to take into account that, although the Moon and Sun in the second version of the myth are being drawn by Mani and Sol, they are not Mani and Sol. This resolves the apparent contradiction of male and female that is referred to above in the passages from *Grimnismál*. In contrast, Night and Day are the literal personifications of night and day. In reference to the chariot of the Sun, much work has been done recently on the apparent connection to the Bronze Age Trundholm Sun Chariot dating from 1400 BCE. This figure depicts a horse drawing a solar disc in a chariot. One side of the disc is gold and light and the other side is bronze and dark. Recent analysis by Klaus Randsborg and Kjeld Christensen on the ornamental units on each side has led them to the conclusion that the light side depicts a 366-day solar calendar, and the dark side depicts a 354-day lunar calendar⁷.

There is one final aspect of the Sun and Moon myth: the two wolves that chase the Sun and the Moon, and who will eventually catch them and destroy them. Skoll chases the Sun and Hati Hrodvitrnisson chases the Moon. There is also a wolf referred to as Managarm, who will swallow heavenly bodies, spatter heaven with blood and cause the Sun to lose its shine. John Lindow points out that Garm is a name that always has connotations of one who destroys, so that Managarm means moon-destroyer.⁸ Rudolf Simek has pointed out that the wolves could be an

⁷ K. Randsborg and K. Christensen, 'Bronze Age Oak-Coffin Graves' in *Acta Archaeologica*, ed. Klaus Randsborg, Vol. 77, Issue 1 (2006): pp. 3-246.

⁸J. Lindow, *Handbook of Norse Mythology: A Guide to the Gods, Heroes, Rituals, and Beliefs* (Santa Barbara, California: ABC-Clio, 2001), p. 135.

explanation of the phenomenon of parhelia.⁹ This atmospheric phenomenon occurs as lights that can appear 22° to either side of the Sun if the conditions are correct, and are called sundogs in English. Simek notes that parhelia are called *Solvarg* in Norwegian, and *Solulv* in Swedish, both meaning sun-wolf. What Simek does not mention is that the same phenomena can also occur around the Moon and are known then as paraselenae, or moon dogs in English, which adds weight to his claim.

Meaning of time

As Margaret Clunies Ross points out, there is an important distinction between *Voluspa* and the other sources.¹⁰ In *Voluspa*, the heavenly bodies are already in place and it is the gods who set them in motion; the other sources have the heavenly bodies made out of Ymir first. What the sources all have in common is an obsession with time, and how it is measured by the heavenly bodies. There is, first of all, a distinction made between those heavenly bodies that are fixed and those that move in a wandering course. The ones who wander are also noted as having differing courses. This would denote knowledge of the five planets that are visible to the naked eye (Mercury, Venus, Mars, Jupiter and Saturn), as opposed to just the Sun and Moon, which are mentioned separately. The division of time is noted as first being different parts of the day; then the Moon and Sun pass through the sky to create separate days; then the new Moon and dark of the Moon calculate the months; these then create the years. As Lindow points out, the name Mundilfæri can also be broken down, with the main part coming from Old Norse *mund* – ‘period of time’ – so the name can be translated as ‘he who causes periods of time to move’.¹¹ After the creation of the world, the establishment of the heavenly bodies and the start of time, there are two later stories of stellar creation that occur.

Thiazi

The first story of stellar creation concerns the giant Thiazi who appears to have been a very important character in Old Norse mythology and is mentioned several times in *Skaldskaparmal* and in Eddic poetry. In

⁹R. Simek, *Dictionary of Northern Mythology* (Cambridge: D.S. Brewer, 2000), p. 292.

¹⁰M. Clunies Ross, *Prolonged Echoes: Old Norse Myths in Medieval Northern Society* (Odense: Odense University Press, 1994), p. 236 n5.

¹¹Lindow, *Norse Mythology*, p. 233.

Skaldskaparmal there is a detailed story of the giant and how he is killed chasing the trickster god Loki into the god's realm of Asgard. Some time later Skadi, the daughter of Thiazi, arrives at the gates of Asgard to demand compensation for her father. The gods agree to this, and as part of this compensation Odin takes the eyes of Thiazi and casts them up into the sky and creates two stars out of them. In the Eddic poem *Harbardzljod* ('The Lay of Harbard'), it is Thor who claims to have cast Thiazi's eyes into the sky and turned them into stars, thereby giving Thor a creative power similar to Odin.

Aurvandil

The second stellar-related tale also occurs in *Skaldskaparmal*. Thor defeated the giant Hrungnir in a duel, but a piece of the giant's whetstone embedded itself in Thor's head, and so he sought a sorceress called Groa, the wife of Aurvandil the Bold, to free it. As she sang spells, Thor told her of a favour he had done for her. Earlier, Thor had carried Aurvandil in a basket south from Giant land and while he crossed the Elivagar, one of Aurvandil's toes had popped out the basket and become frostbitten. Thor broke off the toe and cast it up into the sky, making a star out of it called Aurvandilsta ('Aurvandil's toe'). Groa became so excited by this news that she miscast the spells, and the whetstone remained in Thor's head.

Simek believes that this tale of Aurvandil is an anecdote that Snorri invented as an explanation of the name Aurvandilsta, following on the same pattern of stellar creation that he used in the previous myth of Thiazi's eyes.¹² To further explain the matter, Simek refers to the etymological significance of the name Aurvandil, of which more below. Lindow refers to the same etymological significance as Simek and also notes that the creation of the star is a cosmogonic act in which Thor is involved, paralleling it with how Odin, Vili and Ve dismembered Ymir and created the cosmos from him.¹³ For both Simek and Lindow the importance of the passage lies in the act of stellar creation in which Thor takes part. Thor can be seen to have added to the creation that Odin and his kin started with the dismemberment of Ymir. This act in itself is not uncommon in stellar mythology, as can be seen in the many acts of stellar creation that take place in Greek mythology long after the creation of the

¹² Simek, *Dictionary*, p. 24.

¹³ J. Lindow, 'Thor's Duel with Hrungnir', *alvissmál: forschung zur mitte lalterlichen kultur Skandaviens*, Vol. 6, (1996): pp. 3-20.

universe, such as that of Perseus and Andromeda. However, this act is important, as it places Thor as another creative element in the cosmos.

The etymological significance of the name Aurvandil is connected by both Simek and Lindow to the Old English Earendel. This name appears in the mid-eighth-century poem associated with the Old English poet Cynewulf, called *Crist II*. The etymology of Earendel in Old English has several meanings. It can be seen as a ray of light that precedes day, the coming or rising light, which glosses the Latin *aurora* – ‘dawn, daybreak’. It can also be seen as an epithet for Christ, rendering the Latin *oriens* – ‘the rising sun or light’ – and for John the Baptist’s rendering of the Latin *Lucifer* – ‘light bringer’. It is also used as a gloss for the Latin *jubar* – ‘light, radiance, sunshine’.¹⁴ It can be seen then that the Old English meaning of Earendel has the meaning of light, and especially that of the dawn. The day star or morning star seems to refer to the planet Venus, and *oriens* and *lucifer* are alternative Latin names for that planet.

Simek connects the name Earendel etymologically with Aurvandil by using the work of Much, which he approaches tentatively. This etymology takes Old Norse *aurr-* (‘gravel, mud, mire’) and adds it to Vandal (as in the Germanic tribe which invaded the Roman Empire in the fifth century), which then becomes ‘bright vandal’.¹⁵ Or it takes *aurr-* and adds it to *vondr* (‘staff, stick’) which then becomes ‘ray of light’. This etymology is very unsatisfactory, and bears no relation to Old English Earendel, but unfortunately seems to have been taken for granted by almost every scholar who deals with this matter. I would suggest that unless a more satisfactory etymological connection can be made between the two, the ‘Earendel equals Aurvandil’ hypothesis should be laid aside. The closer connection of *aurr-* as in gravel, mud and mire with the rivers of Elivagar seems a more obvious parallel.

The learned astronomical tradition in the time of Snorri

At the time that Snorri was writing his Edda there was already a tradition of astronomical observation in Iceland. In c.960 the calendar reformer Thorsteinn the Black amended the old and deficient 364-day calendar by

¹⁴ Dictionary of Old English: *arendel*. I would like to thank Eric Lacey for bringing this and other possible etymologies to my attention.

¹⁵ Dictionary of Old Norse Prose: *aurr*.

adding a week to the year every six or seven years.¹⁶ Two centuries later in c.1150 the Icelandic astronomer Stjornu-Oddi ('Star-Oddi') Helgason created wrote his *Oddatal*, a series of charts of the Sun's altitude at noon and its bearing at sunset and sunrise for every day of the year. At around the same time, Abbot Nikulas Bergsson (d.1159) of Munkathvera monastery travelled on the pilgrimage route from Iceland via Rome to Jerusalem, and while out there he wrote a guide. He mentions in the guide that by the River Jordan, if a man lies on his back on level ground, lifts up his knee with his clenched fist on top and raises his thumb from his fist, the pole-star is to be seen directly above it.¹⁷ The observations of Thorsteinn the Black, Stjornu-Oddi and Nikulas Bergsson show that there was an Icelandic form of direct astronomical observation.

The learned tradition

It is also from the mid-twelfth century that the earliest surviving Scandinavian astronomical treatises date. Indeed the very earliest Icelandic manuscript, AM 732 a VII 4to, from around 1130, is a table used to date Easter. This calculation of Easter relied on a combination of calculation and astronomical observation that is called 'computus' or *Rim* in Old Norse. The first surviving Icelandic computistical and astronomical treatise *Rim I*, or alternatively *Rimbegla*, is preserved in the oldest part of the manuscript GKS 1812 4to dating to 1192.¹⁸ Natanael Beckman researched many of the sources of *Rim I* and they are included in his notes on the treatise.¹⁹ As well as using the work of Icelandic astronomers such as Thorsteinn the Black and Stjornu Oddi, there is also an extensive use of Latin scholars from the continent. The works most used in the treatise were *Etymologies* by the Spanish bishop, Isidore of Seville (560-636), *De natura rerum* ('On the Nature of Things') by the Northumbrian monk, Bede (673-735) and *Imago Mundi* ('Representation of the World') by the German scholar, Honorius (d.1151). The *Etymologies* was an early medieval encyclopaedia comprising twenty volumes and based on earlier Roman handbooks. It included, amongst

¹⁶Ari Þorgilsson, *Íslendingabók, Kristni Saga*, trans. S. Grønlie (London: Viking Society for Northern Research, 2006), p. 5.

¹⁷J. Hill, 'From Rome to Jerusalem: An Icelandic Itinerary of the Mid-Twelfth Century', *The Harvard Theological Review*, Vol. 76, No.2 (1983): p. 80.

¹⁸ Both AM 732 a VII 4to and GKS 1812 4to are held in the collection of Stofnun Árna Magnússonar í íslenskumfræðum in Reykjavík.

¹⁹*Alfræði Íslenzk II. Rímtol*, eds. N. Beckman and K. Kålund (Copenhagen: S.L. Møllers Bogtrykkeri, 1916), pp. 4-64.

other things, discussions of the seven liberal arts, zoology, agriculture, theology and military science, with astronomy appearing in volume three.²⁰ Bede wrote *De natura rerum* in 701; this work discussed the elements, the stars and planets and the motion of the sun and the moon. It derived its title, structure and most of its content from an earlier work of the same name by Isidore of Seville. Bede, however, both supplemented and corrected Isidore, by using Irish sources and a more rigorous use of the works of the Roman author Pliny.²¹ Honorius Augustodunensis was one of the most important writers of the twelfth century, producing more than thirty works that were widely read in the Latin West, none more so than his encyclopaedic work *Imago Mundi*. This work in three parts covers geography, the cosmos, the elements, astronomy, computus and history. Honorius was also known in medieval Iceland for his work *Elucidarius*, which was translated from Latin into Old Norse in the late twelfth century.²² Looking at the evidence above, the writer of *Rim I* worked with encyclopaedic manuals and focused mainly on computus – with some basic astronomy and a little detail about the constellations – but was also influenced by the observations of Icelandic astronomers.

Also contained within the oldest part of GKS 1812 4to are a series of astronomical glosses that give Latin, Arabic and Old Norse star names. It is this interesting glossary that gives another insight into possible indigenous Old Norse star and constellation names. There is also a description of forty-two constellations, in a later fourteenth-century part of the GKS 1812 4to manuscript. This has been recognised by Carlo Santini as a Carolingian text based on the works of the Greek astronomical poet Aratus, called *Excerptum de astrologia Arati*, that was glossed and used extensively throughout the Middle Ages.²³ The glossary contains a wealth of information about Old Norse constellations and star names; it also contains the earliest use of Arabic star names in Scandinavia. The constellation list, although dating from two centuries

²⁰Isidore of Seville, *Etymologies*, trans. S.A. Barney, W.J. Lewis, J.A. Beach and O. Berghof (Cambridge: Cambridge University Press, 2006), p. 24.

²¹Bede, *The Reckoning of Time*, trans. F. Wallis, (Liverpool: Liverpool University Press, 1999), p. xxiii.

²²Svanhildur Óskarsdóttir, 'Prose of Christian Instruction', in *A Companion to Old Norse-Icelandic Literature and Culture*, ed. R. McTurk (Oxford: Wiley-Blackwell, 2007), pp. 342-343.

²³C. Santini, *La Versione in Antico Islandese dell'Excerptum de Astrologia Arati* (Rome: Herder Editrice E Libreria, 1987).

later, is also an excellent source, and the two can be used together with the glossary. Due to space I will only detail two constellations here: Orion, and the star cluster known as the Hyades.

In the glossary Orion is written down as the Old Norse *Fiskikarlar*, or fishermen. Beckman and Kålund say that in the Norway and Iceland of their time, Orion or his belt were also described as fishermen.²⁴ This description fits in well with other folk astronomies of the three stars of Orion's belt. Andres Kuperjanov mentions that in German folk astronomy the three stars of Orion's belt represent the Three Kings who visited Christ in the Nativity.²⁵ John Macdonald however says that the Inuit of Alaska and Canada's Northwest Territories see three seal hunters.²⁶ In some folk astronomy a nearby star is also included as part of the depiction so, for example, the Teleut of Southern Siberia see the star Sirius as a hunter, and Orion's belt as three deer.²⁷ By contrast, the Inuit of Eastern Canada and Greenland see Orion's belt as three runners and the star Aldebaran as a polar bear.²⁸

The Hyades are formed out of a cluster of stars found in the constellation Taurus. In the glossary the Hyades are written down as the Old Norse *Ulf's Keptr* or 'wolf's mouth'. There is no visible connection that can be drawn here between *Ulf's Keptr* and the Hyades by looking at classical mythology. In the constellation list the Hyades are called *Vlfs Kiopt*, so this shows a continuity of two centuries, and would suggest popularity for this name. Beckman and Kålund explain that this cluster can be seen, to some extent, to form an asterism that resembles either a dog's or a wolf's mouth.²⁹ The asterism of the Hyades is triangular, and does indeed resemble an open mouth. In classical mythology the Hyades are represented as a group of individual stars, each star representing a different sister, whereas the gloss is an asterism of a wolf's mouth. As to which wolf it could have represented, it could be the Fenris wolf, but it could also be either of the two wolves who chase the Sun and the Moon. In this case it is important to note that the Hyades or Wolf's Mouth lies

²⁴*Alfræði Íslenzk*, pp. 72-73.

²⁵A. Kuperjanov, 'Pseudomythological Constellation Maps', *Folklore*, Vol. 32, (2006): p. 41.

²⁶J. Macdonald, *The Arctic Sky: Inuit Astronomy, Star Lore and Legend* (Toronto: Royal Ontario Museum, 2000), p. 84.

²⁷Kuperjanov, 'Constellation Maps', p. 40.

²⁸Macdonald, *Arctic Sky*, pp. 84-85.

²⁹*Alfræði Íslenzk*, pp. 72-74.

along the line of the ecliptic, as does the path of the Moon and the Sun. From our perspective from Earth it appears that the Moon and Sun move through the Zodiacal constellations away from the open Wolf's Mouth, until they finally return, full circle, to the Wolf's Mouth.

Conclusion

By the thirteenth century astronomical works from Europe had completely superceded indigenous Scandinavian astronomical traditions. In this paper I have been able to show that there was such a thing as Old Norse astronomy, although this is fragmentary. Through the evidence of the Eddas it can be seen that Odin, Vili and Ve were the prime movers behind the creation of the universe, the ones who set everything in motion. There is knowledge of the planets and different orbits and, in *Mundilfaeri*, we may have another prime mover. The Sun and Moon being driven around in chariots is quite possibly a myth of ancient heritage as seen by comparison with the Trundholm Sun chariot. The two wolves pursuing the Sun and Moon may have their origin in the atmospheric conditions known as *parhelia* and *paraselenae*. There are two acts of later stellar creation that involve both Odin and Thor engaging in cosmogonic acts. There is also evidence of a tradition of direct astronomical observation until at least the mid-twelfth century in Iceland. This is not the end of the story and there are still more sources to be looked into; many medieval Icelandic astronomical manuscripts are still not fully edited, and there is much work to be done in the field of comparative studies with Scandinavian and Sami folklore.

Further, a systematic review and meta-analysis of randomized controlled trials that lowered serum cholesterol by providing vegetable oil rich in linoleic acid in place of saturated fat without confounding by concomitant interventions was conducted. Setting One nursing home and six state mental hospitals in Minnesota, United States. A Systematic review identified five randomized controlled trials for inclusion (n=10 808). In meta-analyses, these cholesterol lowering interventions showed no evidence of benefit on mortality from coronary heart disease (1.13, 0.83 to 1.54) or all cause mortality (1.07, 0.90 to 1.27). A other recovered MCE documents and data sources as described in part 1 of the appendix. Old Norse may be succinctly characterized as the "language of the vikings". Indeed the term viking is found in Old Norse itself; but its use in other languages (cf. Old English wicing), where it refers to the seafaring marauders who plagued their shores, typically forms the basis for the modern connotations. Beginning in the late 8th century AD, much of western Europe fell subject to periodic harassment by these ship-borne warriors from the north, and their desecration of such holy sanctuaries as Christian monasteries did much to cement the notion of ruthless, lawless savages which remains bound to the term viking. The primary goal of the "Vanishing & Appearing Sources during a Century of Observations" (VASCO) project is to search for vanishing and appearing sources using existing survey data to find examples of exceptional astrophysical transients. The implications of finding such objects extend from traditional astrophysics fields to the more exotic searches for evidence of technologically advanced civilizations. In this first paper we present new, deeper observations of the tentative candidate discovered by Villarroel et al.