

Did Boötes Drive a Wagon with Oxen on the Minoan Star Map?

Peter E. Blomberg

Abstract. When trying to understand today's map of stellar constellations there are problems with the names of some of the northern ones. One of the problems is that Boötes, the Ox-driver, has a Bear nearby on our modern map but no oxen. However, when we study the first European description of the night sky, Aratos, *Phaenomena*, c. 275 BC, he has a wagon but no oxen nearby. In many popular cultures we find various names for the constellation that we call Ursa Major, the Great Bear. No European folk culture names it Bear. It is normally understood as a wagon, in some cultures drawn by oxen, in others as oxen only. In some north European cultures Ursa Major is seen as an elk. This paper will discuss the possibilities that earlier Greek cultures saw Ursa Major, our Big Dipper, as a wagon driven by oxen or as oxen only. The discussion is based mainly on literary sources from Greek and Roman times. It will also discuss why the two constellations close to the North Pole and to Boötes became Ursa Major and Ursa Minor.

Boötes, Ursa Major and Ursa Minor

When trying to understand today's map of stellar constellations there is a problem concerning the origin of names for some of the northern constellations. Most of the modern constellation names have a Greek background. Early Greek culture was, at least, a transit site for knowledge about the movement of the heavenly bodies, and our modern names are almost all of Greek origin. It seems that the sky was divided into constellations with names well before 700 BC when Hesiodos' and Homer' texts were written in which stars and constellations were used to determine the seasons and directions. The tradition must have been much older. Earlier I have shown that it seems that the Minoans around 2000 BC used the same names for many constellations as we use today. Several scholars have also shown that some positions of stars given by Aratos date back to about Minoan times, indicating a careful study and knowledge of the sky already about 2000 BC on Crete (Blomberg 2002b: Appendix). In most cases the popular names of constellations are the same, or have the same meaning, as those on the scholarly sky map. However, there are some exceptions; the most prominent ones are the two Ursa constellations, Ursa Major and Ursa Minor. It seems that this discrepancy existed already during the Greek Classical Period and it is an enigma how and when Ursa came to be part of the names of these two

very important constellations. Normally it is said that constellations got their names from well-known animals and objects, i.e. animals and tools used in the name-giving culture. As it seems that most constellation names have come down to us from the Minoans on Crete, Ursa or Bear is not logical and is at odds with the prevailing idea as to how the names of constellations came to be, as there were no bears on Crete and the animal as such is very rare in Hellenic iconography even during later times.

I have searched for the early Greek constellations in early texts and the commentators on the early writers on astronomy, e.g. in the so-called Scholiasts,¹ a term used for those who wrote commentaries in the margins of manuscripts. Many of those commentaries revile popular views on e.g. constellations. But there are also commentaries written by those who translated the Greek texts into Latin.

When we study the earliest remaining complete European description of the night sky, the *Phaenomena* written by Aratos c. 275 BC (Kidd 1997), there is a wagon but no oxen near Boötes, the Ox-driver. Two constellations are mentioned as being close to him, the two constellations we call Ursa Major and Ursa Minor, circling the north, one of which is also called the Wagon. In many popular cultures we find various names for these two constellations. No European folk culture names them Bear. Ursa Major, or a part of it, is normally understood as a wagon, sometimes driven by oxen, or as seven oxen only. In some North-European cultures, Ursa Major is seen as an elk.

The Literary Context in Aratos

When Aratos describes Boötes in relation to the surrounding constellations, he says that he comes "like a man driving", and then follows a difficult sentence telling that he is touching "ἀμαξάϊης... Ἄρκτου", translated as Wagon-Bear (Aratos: lines 91 ff), but the meaning is easier to understand as Arktos' wagon (I will use Arktos as the English name for that constellation during this discussion in order not to confuse it with the real meaning of the Greek word until a conclusion is reached). A Scholist (27) introduces the word for *shaft* here. Later, when Aratos describes the motion of the stars and constellation he says:

"No more will Boötes bulk large above and below the horizon, the lesser part being above, and the

greater already in darkness. It takes four signs of the Zodiac for the Ocean to receive Boötes' setting. When he is sated with daylight, he occupies more than half the passing night in the loosing of his oxen, in the season when he begins setting as the sun goes down" (Aratos: lines 581–585).

The Greek term used is *βουλυτῶ*, a word formed by *βους*, ox, and *λυω*, to loosen, unyoke, etc.; as noun it is normally understood as indicating the time of the day when it is time to unyoke one's oxen, i.e. the late afternoon or the evening. However, literally it means to unyoke oxen, something a farmer normally does at the end of the day. Aratos uses *βουλύσιος ὄρη* twice with the meaning late afternoon, i.e. at the time (*ὄρη*) for unyoking oxen (Aratos: 825, 1119). In lines 819–831 he describes how the sun looks at sunrise and sunset when presaging good weather; he uses "the time for unyoking the oxen" to indicate sunset. In lines 1110–1119 he describes how the cattle behave in the late afternoon if the weather will be bad the following day. In these two cases it is clear that he means late afternoon, both from the context and from the clear expression *ὄρη*. When *βουλύσιος ὄρη* is used for describing late afternoon or evening, it is used for a definite, not too long period, not as the length of time described by Aratos in lines 581–585, which is the time it takes for four zodiac constellations to set, i.e. a substantial period of time. It seems therefore not wrong to understand line 583, when Boötes is setting, as if he really is departing from his oxen by unyoking them.

Homer's Use of *βουλύσιος ὄρη* – Time to Unyoke the Oxen

Homer used the expression "unyoking the oxen" twice. That Homer meant sunset is clear, as he in one case describes what happened during the day and the evening when the battle turned; the evening is then described as when it is time to unyoke the oxen (Homer, *Odyssey*: IX: 58), in the other case he describes the evening as the time for Helios to unyoke his oxen (Homer, *Iliad*: XVI: 779). We can conclude that Homer clearly used the expression "unyoking the oxen" to indicate the evening or sunset, which was not a substantial length of time for him as it was for Aratos when he described Boötes setting.

A hint towards understanding the northern constellations is given by one of the early anonymous commentators on Homer, as he says that Boötes is near "the bears, who look like cattle and flee in panic from their herdsman".² It is interesting that this Scholast says that the bears look like cattle, and this may mean that they were seen as cattle in folklore.

If we thus understand Aratos' expression to indicate that the early Greeks saw Boötes' setting as a splitting up from his oxen, and the different commentaries on Aratos and Homer to indicate cattle and a shaft close to Boötes, the early Greek sky would agree with other cultures where the Big Dipper is understood as a wagon with oxen, or oxen only. The popular belief in early Greece would then be the same as in surrounding cultures as well as in the cultures east of the Mediterranean.

How the Material from Petsophas and Traostalos Fits this Understanding

The terracotta figurines from Petsophas and Traostalos have earlier been shown to most likely depict constellations, parts of constellations, or other heavenly objects such as comets (Blomberg 2000, 2002a, 2002b). Almost all major constellations are represented. However, one of the most striking is missing, the Big Dipper – or Ursa Major – again an enigma if understood as a bear. If we instead accept the conclusion made above, based on the literary evidence, and postulate that the Greeks had the same northern constellations as their neighbours, we would expect to find oxen amongst the terracottas and indeed there are a substantial number of them found on those hill-tops, but no bear at all. All bulls are complete animals not the forepart only, as we see Taurus.

The bull is common in Minoan iconography in all kinds of contexts, but bears are almost non-existent and they seem not to have lived on Crete. Some of the bulls have decoration that could be understood as stars or constellations.³

A wagon has been found "near Palaikastro" (i.e. on or near Petsophas) but not in an archaeological context (Davaras 1976: fig. 187; Crouwel 1981: pl. 49/T52). The wagon is dated to MM I, i.e. the same period as the figurines from Petsophas and found at the same time as the first excavation of Petsophas. This wagon is unique to Crete but has never been questioned as being original and from the Petsophas area. There is also a wagon driven by oxen in one of the showcases in the archaeological museum at Heraklion. Several model wagons made of copper alloys, some with oxen pulling them, are known from Syria and Anatolia (Littauer & Crouwel 1973). They are not found in any dateable archaeological context, but all are dated to the Bronze Age. The oxen have, like the terracottas from Petsophas and Traostalos, no indication of sex. The models cannot have been copies of functional farm wagons, and it is stated, "thus for the possible function of the models we are left with cult use of some kind" (Littauer & Crouwel 1973: 125).

We can conclude that the material from these two hilltops and other material from Crete does not contradict the view that Boötes was driving two or more oxen.

The hill Petsophas has recently been connected to the myth of Diktaian Zeus and understood by MacGillivray as a place where the heavenly bodies were studied and perhaps worshipped (MacGillivray 2000: esp. ch. 14). In the same publication it is suggested that Diktaian Zeus is connected with the constellation Orion and the author also concludes that the statuette of a youth, found in the excavations at Palaikastro, represents the constellation Orion. This view is not shared in this study, but the importance of Petsophas as a major place for studying the motions of the stars is accepted. I would rather connect the figurines of standing young men with Boötes; Mary Blomberg and Göran Henriksson have connected them with Arkturus, the brightest star in that constellation (G. Henriksson & M. Blomberg 1996: 112 ff.).

Ursa Major in Early Texts

An early comment on the meaning of Arktos mentions the instructions given to Odysseus as to how to find his way over the ocean (Strabon: 1.1.6). He should sail having Arktos on his left (Homer, *Odyssey*: V. 262–281). This passage is often understood to mean that Homer knew only one constellation close to north, but Strabon explains Arktos as being the circumpolar stars or the Arctic Circle, as defined by the early Greeks, i.e. the circle that encloses the circumpolar stars. Their arctic circle changed locally, as its position in the sky changes with the latitude. Other early authors sharing this view were, according to Strabon, Heracleitus (6th–5th c. BC) and Crates (1st c. BC).⁴ These three authors are especially interesting as they lived in the Greek tradition and used the Greek language and, in the case of Heracleitus, just at the time when the *Odyssey* was written down in the form that has reached us. The word during their own time for the Arctic Circle was ἡ ἀρκτικός which may mean ‘near the bear’, ‘arctic’, ‘northern’, etc. This interpretation was totally accepted by the English scholar Robert Brown who translated Aratos in the 19th century and had difficulties with the constellation Ἄρκτος (Brown 1899–1900: 250–251). Arktos as originally referring to the circumpolar stars seems to be the most logical explanation, as there are several cases in the literature where Ἄρκτος is used for North. Herodotos (1.148), for example, says that a place is said to face north – ἄρκτον. This very early understanding of Arktos for the Greek circumpolar stars makes it very easy to understand why two names were used by several early authors, one for the circumpolar stars amongst which Ursa Major

is the main constellation, and another for Wagon, which today in English is called the Big Dipper.

This means that Arktos, according to Strabon, is misunderstood and is not a northern constellation but simply North. However, both Homer and Aratos give a name for a constellation in the North that seems very logical, the Wagon or Ἄμαξα (Aratos l. 27; Homer *Odyssey*: V: 273). Nonnos (Panoopolitanus, 5th or 6th century AD) connects bear and wagon in his *Dionysiaca* (XLVII), a real mixture. Hyginus (112.1–2), another Roman author, says that the tradition concerns not a bear, but a wagon and oxen – five stars make up the wagon and two the oxen. In the translation of Aratos’ poem into Latin by Germanicus Caesar it is said: *Arctoe seu Romani cognominis Vrsae* (line 25), i.e. The Greek Ἄρκτος is translated with Ursa but the author adds that the two constellations are also seen as Ploughs (lines 25 ff.).

Arktophylax

A second name for Boötes is Ἄρκτοφύλαξ, meaning bear watcher. The name can very well also mean a constellation related to the Arctic Circle, *Watcher of the Arctic Circle*, as it is partly circumpolar, partly not. According to Aratos (lines 720–723), Boötes’ left hand never sets and it would make the circumpolar stars fairly easy to identify by a navigator. During Middle Minoan times the main star Arkturus, positioned in the southern extremity of Boötes, rose and set at about 38 degrees off true north. Earlier and in the more northerly part of Greece, where Homer is said to have come from, the star Arkturus was itself circumpolar in early Minoan times, i.e. the constellation and its stars could be used for identifying the limits of the circumpolar stars. Even in this case we find a logical explanation for a name we use today as meaning bear watcher, having had a very different meaning from the beginning, i.e. watcher or indicator of the Arctic Circle. We can conclude that the name Arktophylax does not contradict the understanding of Arktos as meaning the North or the Arctic Circle.

Let us return to the Big Dipper. As seen above it was understood as a wagon in most cultures around Greece, and in most of them as a wagon drawn by one or several oxen. The Latin word for the Big Dipper, *Septemtriones*, means *the seven ploughing oxen, seven stars near the North Pole* but also *the northern region, the North*.⁵ In modern Italian it means North. The old *Thesaurus Graecae Linguae* from the first half of the 19th century gives *septemtriones* as translation for Ἄμαξα.⁶ That the Romans took their astronomy from the Greeks is clear and we can thus, as some early scholars have done, say that it is clear that the

early Greeks saw the Big Dipper as one or several oxen with a wagon.

Conclusion

When studying the early texts it seems that the original Greek constellation today called Ursa Major was seen as one or several oxen pulling a wagon and driven by Boötes. The modern name must be a misunderstanding in translating the Greek texts into Latin. We do not need to seek an eastern background in order to understand the name Arktos.

Comments

¹The Scolia texts are collected in the CD program *Thesaurus Linguae Graecae*, and the list of works included is to be found in Berkowits and Squitier 1990.

²Schol. Od V:272 (Scholia vetera, D Scholia). I thank Prof. Tullia Linders for discussing this passage and translating it.

³In showcase 18 in the museum in Agios Nikolaus there is a fragment of a bull the forepart of which has 8 white dots within two concentric circles, and in Sitea there is a bull with black dots connected by lines.

⁴Both cited and discussed by Strabon 1.1.6.

⁵Chambers Murray, *Latin-English dictionary*, s.v. septem-triones. Szemerényi (1962: 19) discusses the Latin word for the Big Dipper, septemtriones and shows that it meant seven oxen and that it was the Roman word for the Big Dipper.

⁶*Thesaurus Graecae Linguae*, by Henrico Stephano, Paris 1831–1856, s.v. 'Amaxa.

References

Aratos = Kidd, D. 1997. *Aratus Phaenomena*. Cambridge Classical Texts and Commentaries, Vol 34. Cambridge.

Aratus = Gain, D. B. (Ed.) 1976. *The Aratus Ascribed to Germanicus Caesar*. London.

Berkowits, L. & Squitier, K. A. 1990. *Thesaurus Linguae Graecae. Canon of Greek Authors and Works*. 3rd ed. New York & Oxford.

Blomberg, P. E. 2000. An Astronomical Interpretation of Finds from Minoan Crete. *Oxford VI and SEAC 99 "Astronomy and cultural diversity"* Proceedings of the international conference Oxford VI and SEAC 99" held at Museo de la Ciencia y el Cosmos, LaLaguna, Junio 1999. LaLaguna.

Blomberg, P. E. 2002a. An Attempt to Reconstruct the Minoan Star Map. *Astronomy of ancient societies*. Pro-

ceedings of the Conference "Astronomy of Ancient Civilization" of the European Society for Astronomy (SEAC) associated with the joint European and National Astronomical Meeting (JENAM) Moscow, May 23–27, 2000. Moscow, pp. 93–99, with Russian translation pp. 99–101.

Blomberg, Peter E. 2002b. The Early Hellenic Sky Map Reconstructed from Archaeoastronomical and Textual Studies. To appear in *The Proceedings of the European Archaeological Association conference in Thessaloniki September 2002*. British Archaeological Reports.

Brown, Robert 1899-1900. *Researches into the Origin of the Primitive Constellations of the Greeks, Phoenicians and Babylonians*. 2 vols. London.

Crouwel, J. H. 1981. *Chariots and Other Means of Land Transport in Bronze Age Greece*. Allard Pierson series, Vol. 3. Amsterdam.

Davaras, C. 1976. *Guide to Cretan Antiquities*. Athens.

Henriksson, G. & Blomberg, M. 1996. Evidence for Minoan Astronomical Observations from the Peak Sanctuaries on Petsophas and Traostalos. *Opuscula Aethniensia*, Vol. 21, pp. 99–114.

Herodotos = Godley, A. D. (Ed.) 1990. *The Histories*. Loeb Classical Library, Vol. 117. Cambridge & London.

Homer = Murray, A. T. 1984. *The Odyssey*. Loeb Classical Libray, Vols. 104–105. Cambridge & London.

Homer = Murray, A. T. 1988. *The Iliad*. Loeb Classical Libray, Vols. 170–171. Cambridge & London.

Hyginus = *l'Astronomie*. Collection des universites de France. Paris, 1983.

Kidd, D. 1997. *Aratus Phaenomena*. Cambridge Classical Texts and Commentaries, Vol. 34. Cambridge.

Littauer, M. & Crouwel, J. H. 1973. Early Metal Models of Wagons from the Levant. *Levant*, Vol. V, pp. 102–126, pls. 32–44.

MacGillivray, J. A. & Driessen, J. M. & Sackett, L. H. 2000. *The Palaikastro kouros. A Minoan chryselephantine statuette and its Aegean Bronze age context*. British School at Athens, Vol. 6. London.

Nonnos = Panopolitanus: *Dionysiaca*. Vol. XLVII. Paris, 2000.

Strabon = Jones, H. L., 1969. *The Geography*. Loeb Classical Library, Vol. 49. Cambridge & London.

Szemerényi, O. 1962. Principles of Etymological Research in the Indo-European Languages. *Innsbrucker Beiträge zur Kulturwissenschaft, Sonderheft 15, II Fachtagung für indogermanische und allgemeine Sprachwissenschaft, Innsbruck*. Pp. 175–212.