ADALYA 23, 2020
DOI 10.47589/adalya.837489

Reflection on the Sunrise Positions in Early and Middle Bronze Age Extramural Cemeteries in Anatolia

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Abstract

In Early and Middle Bronze Ages extramural cemeteries in Anatolia, burials are occasionally oriented towards the rising sun in various seasons. The orientations of Early Bronze Age burials cluster towards the sunrise in autumn and winter; however, this differs in Middle Bronze Age cemeteries. Burials in Çavlum are mainly oriented towards the rising sun in summer, those in Yanarlar in spring, and in Gordion the winter months. The orientations towards the sunrise from the equinox to the summer solstice in Yanarlar, Tatıka and Çavlum may reflect the superiority of light to darkness, or life to death. Only a few burials are oriented towards the rising sun during the harvest period. In the Early Bronze Age cemeteries of Gre Virike, Aşağı Salat, Elmalı-Karataş and Babaköy, sunrise positions during one month after the autumn equinox dominate. In this month, fields are sown; henceforth, seeds wait for sprouting until the following spring. The rising sun between the equinox and winter solstice is preferred in the Middle Bronze Age, making a peak during the month prior to the winter solstice when animals mate. These give birth after around five months. This natural cycle might have been associated with the dead waiting in the grave like seeds in the ground or like the fetus awaiting life in the spring.

Keywords: burial orientation, sunrise, Bronze Age, Anatolia, Mesopotamia, lifecycle

Öz

Anadolu'da Erken ve Orta Tunç Çağı yerleşim dışı mezarlıklarında mezarlar yaygın olarak güneşin farklı mevsimlerdeki doğuş pozisyonlarına yönelik yerleştirilmiştir. Mezarların yön açıları sayısal olarak kümelendiğinde, Erken Tunç Çağı mezarlarında güneşin sonbahar ve kış aylarında, Orta Tunç Çağı'nda Çavlum Mezarlığı'nda yaz, Yanarlar Mezarlığı'nda bahar, Gordion Mezarlığı'nda ise kış aylarındaki doğuş pozisyonları ön plana çıkmaktadır. Yanarlar, Tatıka ve Çavlum'da güneşin genellikle ekinoks ile yaz gündönümü arasındaki konumunun tercih edilmesi, aydınlıkla özdeşleşen yaşamın ölümle özdeşleştirilen karanlığa galip gelmesi şeklinde değerlendirilmiş görünmektedir. Güneşin hasat dönemlerindeki doğuş konumlarına yöneltilen mezar sayısı azdır. Erken Tunç Çağı'nda Gre Virike, Aşağı Salat, Elmalı-Karataş ve Babaköy mezarlıklarında güneşin sonbahar ekinoksundan sonraki bir aylık doğuş pozisyonları ön plana çıkmaktadır. Bu dönemde tarlalara tohum atılmakta ve ertesi ilkbaharda filizlenmek üzere beklemektedir. Orta Tunç Çağı'nda en çok tercih edilen yön ekinoks ile kış gündönümü arasındaki üç aya rastlamaktadır. Kış gündönümü öncesindeki aylarda hayvanlar gebe kalmakta ve yaklaşık beş ay sonra yavrulamaktadır. Bu doğa döngüsü ölülerin de tohumlar ve yavrularla birlikte ertesi ilkbaharda yaşama dönmesi arzusu ile ilişkilendirilmiş görünmektedir.

Anahtar Kelimeler: mezar yönü, güneş doğuşu, Tunç Çağı, Anadolu, Mezopotamya, yaşam döngüsü

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Introduction

Death is defined as the cessation of biological functions that keep the organism alive and the end of life. People who have lost those around them – relatives and the beloved – might have feared to disappear in this way. To overcome the fear of death, including fears of unknowingness, uncertainty, loneliness and suffering in the underworld, it has become an option to envision death as a supreme reunion rather than extinction. According to the "Psychodynamic Approach" of Sigmund Freud, linking historical events with spirituality and religious phenomena as part of social psychology are behaviors that deny death and desire a new life.[1]

In this context, the mythological worldview is a psychological process that becomes a part of belief systems and social behaviors including predetermined and repetitive acts with symbolic meanings.[2] Ancient Mesopotamians believed that the sky and the earth consisted of three ranks. On the top resided the sky god ^{d}*AN/Anu*, on the second level other gods, and on the third celestial bodies.[3] Human beings and ghosts are on the earth dominated by ^{d}*Enlil*, and the underground is *Abzu* (Deep Ocean) dominated by ^{d}*EA*. At the bottom is the *KI/KUR/ersetu* (underworld), the place of 600 *Anunnaki*, dead spirits (*GIDÌM/etemmu*) and dead demons dominated by the goddess ^{d}*Ereškigal* and her husband ^{d}*Nergal*.[4] The dialogue of *Gilgameš* and *Enkidu* in the mythological story of *Enkidu*'s journey to the underworld reflects the belief that the souls of the dead could get closer to the gods in proportion to the number of their successors who offer food and drink, and that the untreated dead souls suffer. Burying the dead, offering food and drink into graves, burning incense and mentioning the names of the dead in certain ceremonies are behaviors aimed to provide peace for the dead souls.[5] Otherwise, these would disturb their successors.

The Mesopotamian sun god ^{d}UTU/Šamaš walks out the doorway in the mountains in the east, crosses the sky, and passing through the doorway in the sea in the west, descends to the underworld.[6] Meanwhile, the souls of the dead also descend to the underworld. The Hittites and Hurrians believed that the sun goddess of the underworld, ^{d}*UTU-uš/ištanuš*, descended from the west gate to the underworld and illuminated the souls of the dead during the night.[7] So the sun god was also associated with ^{d}*Nergal (Erra/Irra)*. Accordingly, in a prayer to the *Storm God of Nerik* to bring rain,[8] the name of the *Sun Goddess of Arinna* was written interchangeably with the name of the underworld goddess ^{d}*Ereškigal*. In Mesopotamia, offerings were made to the sun god and the underworld gods to prevent the ghosts from affecting the living people:[9] "*in that day,* ^{d}*Šamaš and Gilgameš stand in front of the (underworld gods)... I will pour cold water into your water pipes; heal me so that I can tell you my praises (or gratitude)*"

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1 Karaca 2000, 157; Şahin 2016, foreword; Freud 1993; Rieff 2010, 109-13.

2 Durkheim 1926, 226-370; Wulf 2009, 233-34.

3 Horowitz 1998, 8-9, 16-18, 213, 272-74; Speiser 1969.

4 Kramer 1990, 153-44; Black and Green 1992, 180-82.

5 Byliss 1973, 116-17; Abusch 1974; Tsukimoto 1985; Ökse 2005, 3.

6 Edzard 1965, 126-27; Black and Green 1992, 182-84; Horowitz 1998, 264-66; Foster 2005, 756; 2007, 166-76. The Sun god is ^{d}*UTU* in Sumerian and *Šamaš* in ancient Mesopotamian Semitic languages.

7 von Schuler 1965, 199-200; Collins 2007, 174-77.

8 Sevinç 2008, 177, 179, 183 n. 21; Beckman 2011.

9 Byliss 1973, 118.

The positions of the sun vary according to the earth's orbit and the 23°27' axis inclination. During equinoxes (21st March; 22nd/23rd September) the earth's axis is steep, when the length of the day and night is equal, and sunrise and sunset positions are the same at all latitudes. The oscillation between the summer solstice (21st June) and the winter solstice (21st December) is 46°54' degrees (figs. 1-2). Accordingly, the lengths of day and night and the positions of the rising and setting sun varies at all latitudes every day. The phrase "you stepped in four endless corners" in hymns written to the Hittite sun gods seems to define the four extreme positions of the rising and the setting sun.[10]

This phenomenon seems to have led to the emergence of various beliefs and practices. The astronomical observations of the priests on the path of the sun were also decisive in the establishment and renewal of temples.[11] The two opposite corners of Mesopotamian temples were located according to the sunrise and sunset positions during equinoxes.[12] On the high terrace of Gre Virike established on the eastern bank of the Euphrates, a basalt channel associated with sacrificial pits was placed in an east-west direction during the equinoxes. Thereupon, this complex is suggested to have been used during the *Akītu* feast in the 29th-26th centuries BC.[13] In the rock sanctuary of Yazılıkaya near the Hittite capital Hattuša, Chamber A is suggested to have been planned as such: that the light entering the entrance of Building I during the sunset at the summer solstice would illuminate the relief of Tudhaliya IV.[14] The northwestern wall of Building IV in Yazılıkaya is also supposed to have been oriented towards the sunset at the winter solstice, so that the rock located in the courtyard would be illuminated by the sunset.[15] In the upper city of Hattuša, Chamber 1 of the sacred pool, the southwest corner of Yerkapı, and the King's Gate face the sunset at the winter solstice, while the Sphinx Gate faces the sunrise then.[16] The temple in the Hittite city Šarišša was also oriented according to the sunrise at the summer and winter solstices.[17]

The association of the Sun God or Sun Goddess with the underworld has also impacted the orientation of graves towards the sunrise. In the Bronze Age cemeteries of Western Anatolia[18] and the Balkans,[19] the heads of most skeletons (96%) and the rims of pot/pithos burials appear to be oriented towards the sunrise during various seasons. Also, in Eastern Anatolia, most individuals (53%) were placed in an east-west direction, while some (13%) in northwest-southeast or northeast-southwest directions.[20] Unfortunately, most publications state roughly the main and intermediate directions for the orientation of burials, and precise data is usually not published. Even if the intermediate directions may coincide with the path of the sun during the summer and winter solstices, such a determination is not always possible. Yet in some studies

10 González García and Belmonte 2011, 481.

11 González García and Belmonte 2015, 1786.

12 Lundquist 1984; Shepperson 2012; Ruggles 2015, 376-82.

13 Ökse 2006a, 3-4, 6-7; 2006d, 50-51; 2007a, 94-98; 2017a; Ökse (forthcoming).

14 González García and Belmonte 2011, 466, 481-82, fig. 4a; Zangger and Gautschy 2019, 18, 21-23, figs. 10-14.

15 Zangger and Gautschy 2019, 24-25, fig. 3.

16 Müller-Karpe et al. 2009, 47, 50-61; González García and Belmonte 2011, 481-82; Belmonte and González García 2015, 19-21; Zangger and Gautschy 2019, 26-27, 30, figs. 16-17.

17 Müller-Karpe et al. 2009, 62; Müller-Karpe 2013, 343; 2015, 86.

18 Uhri 2006, 282-83; 2010, 90-93.

19 Vince et al. 1996.

20 Parlıtı 2019, 741, table 5.157.

concerning this matter, the orientation of each grave has been measured and the intensity towards some directions have been determined.[21]

This study deals with the orientations of burials measured from the published plans of Early Bronze Age cemeteries at Çavdartepe, Babaköy, Sarıket, Elmalı-Karataş, Gre Virike and Aşağı Salat; the Early Hittite cemeteries in Çavlum, Gordion and Yanarlar; and the Late Bronze Age cemetery of Beşiktepe (fig. 3). The angles determined for Lycian rock monuments are taken as the basis for seasonal sunrise-sunset directions.[22] Although at first glance most burials appear to have been oriented in different directions, the orientation of more than nine-tenths of the burials meet the sunrise positions in particular seasons. Nevertheless, the rugged profile of the eastern horizon may have caused deviations. Indeed, the sun rises at an angle relative to the horizon in the morning (fig. 1), so the viewer can see the sun on the hills from a point that slides southwards.

Based on the extramural cemeteries examined in this study, graves were mostly directed to the sunrise positions in different seasons, though some seasons come to the forefront. These seasons coincide with the dates of some feasts related to various stages of agricultural activity and animal husbandry. Compared with the Mesopotamian and Anatolian agricultural and ritual calendars (tables 1-2), these preferences may define possible reasons.

Early Bronze Age Cemeteries

Baklatepe Cemetery near Menderes in Izmir province provides earthen, stone cist and pithos graves dating to the Early Bronze Age I. The individuals were laid in an east-west direction with their heads towards the east, without any data on exact directions.[23] In the Early Bronze Age II cemetery to the south of Baklatepe, 64 graves, mostly pithoi, have been uncovered. According to the measurements on the published photos, the rims of the pithoi face the sunrise during the equinoxes. In Ulucak Höyük Cemetery near Kemalpaşa in Izmir province, 45 pithos burials facing the east and southeast are dated to the Early and Middle Bronze Ages.[24] No exact directions for all these cemeteries were given in the publications.

Kusura A Cemetery on the Sandıklı Plain in Afyon province is dated to the transition from the Late Chalcolithic to the Early Bronze Ages, and to the Early Bronze Age I.[25] The 13 burials, mostly pithoi, were orientated with small deviations towards the sunrise during one month after the fall equinox and towards the winter solstice (fig. 4). On the other hand, the skeletons were placed with the head at the bottom of the pithoi.

In Babaköy (Başpınar) Cemetery near Bigadiç in Balıkesir province, 23 jar and cist graves dating to the Early Bronze Age II-III were unearthed.[26] The rims of the pithoi were covered with stone slabs facing east with small deviations. The heads of the individuals were at the rims. Nearly two-thirds (72%) of these pithoi were oriented towards the sunrise positions throughout the period from the equinox to the winter solstice (fig. 4).

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21 Massa 2014.

22 González García and Belmonte 2014, fig. 2a.

23 Özkan and Erkanal 1999, 18, 29, 31.

24 Çilingiroğlu et al. 2004, 53-63.

25 Stewart 1936, 55-62, fig. 25.

26 Bittel et al. 1939-1941, 5, fig. 3; Özgüç 1948, 52-53.

Çavdartepe (Yortan) Cemetery, located to the east of Kırkağaç in Manisa province, was used during the Early Bronze Age.[27] The pithoi face east with some deviations. Most (80%) are oriented towards the sunrise positions halfway between the winter solstice and the equinox (fig. 4). A small portion (9%) aligns with the sunrise between the equinox and the summer solstice, while others (9%) are adjusted towards the summer solstice and the north. Only two pithoi face the sunrise at the winter solstice.

Karataş Cemetery, located to the east of Elmalı in Antalya province, is dated to the Early Bronze Age II.[28] The rims of 445 pithos burials covered with stone slabs face the east and northeast. Among these, only the orientation of 90 pithoi could be measured. The rims of 90% of these are directed towards the rising sun during one month after the fall equinox, 10% towards the sunrise between the equinox and the summer solstice, while the rest towards the winter solstice (fig. 5).

At the beginning of the 3rd millennium BC, about 10 km north of Carchemish, a high terrace was constructed in Gre Virike on the east bank of the Euphrates River. Two rectangular pools on the northwest corner of the terrace have narrow edges facing the sunrise after one month (10° to the south) following the equinox. These were most probably constructed as libation installations.[29] In the 25th-21st centuries BC, an underground chamber tomb had been placed in one of these pools, and two chamber tombs had been constructed to its west, each oriented in the same direction with entrances in eastern walls[30] (fig. 6). Similar orientations are also measured in the chamber tomb complex of Tell Ahmar.[31] In the last centuries of the 3rd millennium BC, satellite burials were dug into the terrace at Gre Virike.[32] A shaft grave was placed parallel to the chamber tombs, and one pot burial and two cist graves were oriented roughly towards the rising sun at the equinoxes, with slight deviations of around 5° to the north and south. Similar orientations are also attested at the Birecik Early Bronze Age I-II Cemetery located approximately 17 km to the north.[33]

Aşağı Salat Cemetery to the east of Bismil in Diyarbakır province is dated to the transition period from the Late Chalcolithic to the Early Bronze Ages.[34] The 53 stone cists were oriented in a southeast-northwest direction. The orientation of these graves measured from the published plan coincides with the sunrise positions during one month after the fall equinox (fig. 6). A similar orientation is given for Müslümantepe Cemetery located on the opposite bank of the Tigris River.[35]

A cemetery and associated structures dating to the Early Bronze Age I-II have been uncovered at Tatıka in the district of Güçlükonak in Şırnak province.[36] The 40 structures, without any traces of superstructures, are associated with infant burials dug into or leaned against their walls. The animal bones found around the graves seem to have been the remains of funerary

27 Kamil 1982, 1-10, fig. 12.

28 Mellink 1964, 272; Warner 1994, 175, pl. 22.

29 Ökse 2006a, 2, 4-8.

30 Ökse 2006b, 38-39; 2007b.

31 Dugay 2005, fig. 1.

32 Ökse 2006c.

33 Sertok and Ergeç 1999, 90.

34 Akçay 2017, 53-54, 58, fig. 4.

35 Ay 2004, 376.

36 Ökse 2017b.

meals, and broken pot fragments collected in some areas may be the remnants of libation ceremonies.[37] Most of the buildings (80%) face the sunset at summer solstice, and the rest (20%) the sunset.[38] Located on the opposite bank of the river, Zeviya Tivilki had cremation urns placed in the southeastern corner of the settlement.[39] These face the sunrise at the summer solstice, indicating continuity of this tradition further into the 8th-7th centuries BC.

In summary, in Babaköy the orientation of burials towards the sunrise increases during one month after the autumn equinox, and in Elmalı-Karataş during two months following the fall equinox. In Çavdartepe, orientations towards the sunrise during the equinox are frequent. Only half of the burials face the sunrise at the winter solstice, and a few at the summer solstice. In Kusura, orientations toward the sunrise during one month after the fall equinox and during the winter solstice were preferred. Sarıket Cemetery differs from the others. Here more than half of the individuals (52%) face the southeast, and approximately one-third (35%) the sunrise between the equinox and the winter solstice. In Gre Virike, the tombs were oriented towards the sunrise during one month after the autumn equinox. The sunrise at equinoxes and the winter solstice were preferred in the cemeteries in Hassek Höyük, Birecik and Shamseddin A.[40] The subsequent two winter months after the autumn equinox were preferred in Aşağı Salat, and the mortuary structures in Tatıka tend mainly towards the summer solstice.

Middle Bronze Age Cemeteries

In Sarıket (Demircihüyük) Cemetery, located approximately 25 km west of Eskişehir, a total of 499 burials have been uncovered. These include earthen, cist and pithos burials covered with stone plates. These are mostly dated to the Early Bronze Age II; however, 78 graves date to the Middle Bronze Age.[41] Nearly half of the graves were oriented towards the sunrise positions between the equinox and the winter solstice (43%), while the remaining half (48%) between the winter solstice and the south (fig. 7). Only a small number of pithoi were oriented to other directions: 4.5% to the sunrise between the equinox and the summer solstice, 4.5% between northwest and southwest, and two towards the summer solstice and the north. In the Early Bronze Age II cemetery of Küçükhöyük near Bozüyükin in Bilecik province, 204 pithoi and cist graves were reported to face southeast.[42] However, no detailed data on whether these met the winter solstice is available.

In the Çavlum Cemetery located on the Alpu plain, east of Eskişehir, 73 burials dating to the late phase of the Assyrian Trade Colonies and to the Early Hittite Period were unearthed[43] (fig. 8). The rims of 46 pithoi were covered with stone slabs or large sherds. According to their publication, more than half (58%) of these lay in an east-west direction, while the majority of the others are oriented northwest-southeast and southwest-northeast. According to our measurements of the orientations of the burials illustrated in the general plan of the cemetery, most of the pithoi (40%) face the sunrise at equinoxes, more than one-third (37%) the sunrise

37 For similar infant burials in sacred areas and temples in Upper Mesopotamia, see Valentini 2011, 271. For crushed libation vessels in graveyards, see Akyurt 1998, 143.

38 Ökse (forthcoming).

39 Ökse and Eroğlu 2013.

40 Emanet 2017; Ekinbaş 2018, 144-45.

41 Seeher 1992, 6, 16; Massa 2014, 78, 88, fig. 5.

42 Gürkan and Seeher 1991, 39.

43 Bilgen 2005, 3, 13, 45, pl. XCII.

between the summer solstice and the north, a small number (19%) the sunrise between the equinox and the winter solstice, and one pithos the southwest. Accordingly, the sunrise positions around the summer solstice seem to have been preferred in the Çavlum Cemetery (77%).

The Yanarlar Cemetery, 30 km northeast of Afyon, yielded 41 pithos graves dating to the late phase of the Assyrian Trade Colonies and to the Early Hittite Period.[44] The individuals were laid with their heads at the rims and covered with stone slabs. One quarter of the pithoi were oriented towards the sunrise between the summer solstice and the equinox, and another 25% between the winter solstice and the equinox. The others were oriented towards the equinoxes (13%), or towards the sunrise positions between the winter solstice and the south (16%), and between the southwest and the northwest (13%) (fig. 8).

The excavations at Gordion near Polatlı in Ankara province yielded 45 graves dating to the late phase of the Assyrian Trade Colonies and to the Early Hittite Period.[45] Twenty-nine pithos burials were placed in a southeast-northwest direction, and the heads of the individuals were at their rims covered with flat-stone slabs or mud-brick blocks. Nearly half of the pithoi (48%) were oriented towards the sunrise positions between the winter solstice and the south (fig. 9). It appears that the sunrise positions between the equinox and the winter solstice was preferred in one-third of the burials. Of all the graves, a small number of pithoi (12%) are oriented towards the sunrise positions between the equinox and the summer solstice, while only two face the sunrise between the summer solstice and the north.

The Ilıca Cemetery near Ayaş in Ankara province is dated to the late phase of the Assyrian Trade Colonies and to the Early Hittite Period.[46] The rims of 131 pitcher-urns were closed with bowls or potsherds. The urns are generally oriented towards the east (70%). A small portion (16%) face the southeast and northeast, while the rest towards the north or the south. Since no sufficient details have been published, the seasons coinciding with these orientations could not be determined.

The cemetery of Beşiktepe, located southwest of Troy in Çanakkale province, is dated to the 13th century BC.[47] Most of the 56 pithos burials (80%) are oriented towards the sunrise at the winter solstice, and the rest towards the equinoxes (fig. 9).

In summary, sunrise positions in different seasons appear in each Middle Bronze Age cemetery. Although all these are located in the northern part of Central Western Anatolia and represent similar material cultures, sunrise positions in summer are preferred in Çavlum, those in spring in Yanarlar, and the rising sun in winter at Gordion. The orientations of the Late Bronze Age burials in Beşiktepe towards the sunrise during one month before and after equinoxes, appear to be a regional difference, or a varying practice of the following period.

Agricultural Calendar and Festivals

The rhythmic changes in the sun's oscillation is the source of life that brings light and heat to the earth. It also determines the timetable for the birth of animals, the growth of plants, the planting of crops, and the harvest. In the agricultural calendars[48] used in Anatolia and the Near

44 Emre 1978, 12, 16, plan 2.

45 Mellink 1956, 5-7, 57, pl. 1.

46 Orthmann 1967, 36.

47 Korfmann 1986, 320, fig. 6; Basedow 2000.

48 Özergin 1969, 5276; Sarı 1970, 68-70.

East until recently, the seasons were determined according to the equinoxes and solstices. According to the Babylonian calendar in the 2nd millennium BC, the winter solstice occurs in *Addaru* (12th month), the spring equinox in *Simannu* (3rd month), the summer solstice in *Ulūlu* (6th month), and the autumn equinox in *Kislimmu* (9th month). In the *Mul.Apin* texts dated to the Old Babylonian Period, the longest night was determined as the 15th day of the 9th month, the shortest night the 15th day of the 3rd month, and the equinoxes the 15th days of the 12th and 6th months.[49] In the Neo-Assyrian tablets,[50] these seasonal turns coincide with the 1st month (*Nisannu*), the 4th month (*Du'uzu*), the 7th month (*Tašrittu*) and the 10th month (*Tebētu*) (tables 1-2). The archives of Ešnunna, Abu Salabikh, Lagaš, Gasur (Nuzi), Ebla and Mari refer to a calendar used in Anatolia and Northern Mesopotamia between 2600-2000 BC.[51]

The New Year - the First Month of the Year (March-April)

The spring equinox (21st March) - when day and night are equal - is the beginning of the new agricultural year in various cultures. Hereafter, days gradually get longer and the weather gets warmer. Plants begin to sprout, and animals bear their offspring. In the Mesopotamian calendar, the month following the spring equinox, *Nisannu* (the first month of the year, the beginning, the first crop, the first barley offer), is considered as the annual parade of the great gods.[52] In the 1st-12th days of this month, people offered the earliest fruits to the gods in the *Akītu* (New Year) feast.[53] The first month of the calendar used between 2600-2000 BC is *Za'atum* (sheep/goat herd), which coincides with the birth of offspring.[54]

The Hittites celebrated the beginning of the New Year with the *AN.TAH.ŠUM*^{ŠAR} festival. Breads baked with the *AN.TAH.ŠUM*^{ŠAR} plant[55] were offered to the gods, and on the 11th day of the festival, funerary rituals were organized.[56] The Hittites also celebrated a Hattian festival dedicated to the storm god ^{EZEN}*Purulliya* at the beginning of the new agricultural year in the spring.[57] In this context, rainfall (^{EZEN}*ḫewaš*) and thunder (^{EZEN}*Tetḫešnaš*) festivals were also celebrated.[58] In Phrygia, the *Attis* priests fasted and castrated themselves during the *Cerelia* festival dedicated to the goddess *Kybele* (Magna Mater) and her lover *Attis*, who dies in the autumn and resurrects in the spring.[59] During the Roman period, Gallus monks organized this feast on the 25th of March as the *Megalensia* festival accompanied by banquets.

In Anatolia, various festivals, such as *Nevruz*, *Çiğdem Günü* (Crocus day), *Mart Dokuzu* (9th of March), *Yılsırtı* (new year), *Günsırtı* (new day) or *Yazbaşı* (beginning of summer) are still being celebrated at the spring equinox. During these, festivities associated with banquets

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49 Brown 2000, 113, 115, 117.

50 Horowitz 1996, 42-44; 1998, 192, 196.

51 Cohen 1993, 23-29.

52 Horowitz 1996, 36-37; 1998, 199; CAD 11(II), 266; Cohen 1993, 305-11.

53 CAD 1(I), 267-68; Black 1981, 41-42; Black and Green 1992, 136-37; Black et al. 2000, 255.

54 Cohen 1993, 23-29.

55 *AN.TAH.ŠUM*^{ŠAR} is considered a bulbous plant like the crocus, iris, saffron and snowdrop; see Ertuğ 2000.

56 Sachs 1969; Haas 1994, 772-74, 819; Ökse 2006d; Shepperson 2012.

57 Haas 1994, 696, 722; Hoffner 1997, 391-92. The Purulliya (growth, soil) feast celebrates both the renewing of nature and the king's power, and is a New Year festival originating with the Hattians.

58 Demirel 2017, 23, 25.

59 Çapar 1978, 177-79.

are organized, and people make wishes.[60] As the weather warms up and the snow melts, children read verses (*mânî*), collect crocus blossoms, take bulgur and fats from several houses, then cook and eat them all together.[61]

Only a small part of the Early Bronze Age graves and a small number of burials in the Middle Bronze Age cemeteries of Gordion and Yanarlar are oriented towards the sunrise positions during this month. Although people made offerings to the graves during the New Year's feasts, grave orientation in this direction is not generally preferred.

Development of Product and Propagation - the Second Month of the Year (April-May)

In Anatolia, cereals sprout in the spring and are watered by rain in April and May. During these months, seedlings are planted and pruned, and animals give birth to offspring. May is the harvest time for early legumes, forage crops and some fruits. Similarly, in the Mesopotamian calendar, fields were sown as seeds were cast, and the "donkey feast" was celebrated in the month of *Ajaru*.[62] The gods ^{d}*Nabû* and ^{d}*Tašmētum* got married in this month, and in this context celebrations were held in Nimrud during the Neo-Assyrian Period. People celebrated the "warm month feast" in the second month (*Gi-um*) of the calendar used between 2600-2000 BC.[63]

In contemporary Anatolia, no feasts are recorded for the birthing period (*Döl dökümü*). In the Anatolian folk calendar, the summer months (6th May-7th November) are called *Hızır Günleri* (Khidr Days). The prophets *Hızır* (Khidr) and *Ilyas* (Elijah) are believed to have found the secret of immortality and to help those who are in trouble. The *Hıdrellez* Feast is celebrated every year on the night of 6th May, the day these prophets are believed to have met on earth. People visit graves and celebrate the event with festivities and collective meals.[64] However, only a small portion of the Early Bronze Age graves and of Çavlum's Middle Bronze Age graves are oriented towards the rising sun in this month.

Early Harvest - the Third Month of the Year (May-June)

In the agricultural calendar, legumes, forage crops and some fruits are harvested in early May, while crops are ready for harvest in June. In Mesopotamia, seeds were sown for the second crop in the month of *Simannu,*[65] and commemorative ceremonies were held at the summer solstice.[66] These practices suggest that death is identified with harvest. In addition, rituals of producing bricks for buildings were also performed in this month.[67] The Hittite Sickle Feast ($^{EZEN.URUDU}$*ŠU.KIN.DÚ*), associated with the Sun God, was probably celebrated in June.[68] Ancient Greeks celebrated the *Thargelia* Festival in the 6th-7th days of *Thargelion* (end

60 Köroğlu 1999.

61 Türkmen 1969, 5389; Oğuz 2014, 29-30.

62 Cohen 1993, 305-11.

63 Cohen 1993, 23-29.

64 Günay 1995.

65 Black et al. 2000, 323.

66 Cohen 1993, 400-53; Sallaberger 1993, 179-90; Nadali and Polcaro 2016, 106-7.

67 Cohen 1993, 314-15.

68 Hazenbos 2003, 112; Demirel 2017, 26.

of May). During this festival, purification rituals were performed during the seeding and harvesting periods in order to prevent crop diseases. The early harvest was celebrated by offering the first crop to the gods.[69]

It is conceivable that long days in the beginning of the summer may have been attributed to the notion of identifying life with light. However, only very few Early Bronze Age graves and a small part of the Middle Bronze Age graves in Çavlum and Gordion are oriented towards the rising sun in this month.

Second Harvest - the Fourth Month of the Year (June-July)

In the agricultural calendar, harvest time varies in different climate zones. This period generally lasts from June to the end of August. In the folk calendar, July is called *Orak/Ekin Biçme Ayı* (Sickle/Harvest month).[70] After the harvest, fields are immediately planted during July and August in temperate climate zones. For livestock breeders, this month is the period of wool shearing and milk processing.

In Mesopotamia people mourned for ^{d}*Dumuzi* in *Du'uzu/Tam(m)uzu* (July), implying the descent of the god to the netherworld.[71] The fourth month of the calendar used between 2600-2000 BC in northern Mesopotamia and northern Syria is *Irísá* (sowing and planting).[72] Therefore, people might have planted seedlings for the second crop. The ideogram $BURU_{14}$ used in Hittite texts denotes harvest.[73] The Harvest Festival (^{EZEN}Ú.BURU/^{GIŠ}BURU$_{14}$) and the Fruit Harvest Festival (^{EZEN}GURUN), dedicated to the Hittite storm god, coincide presumably with this period.[74] The ancient Greeks celebrated the *Skira* and *Kalligeneia* festivals in the month of *Skirophorion* in the context of the mythological story of Persephone, the daughter of Demeter. Hades, the god of the underworld, abducted Persephone and let her return to her mother every year in summer.[75] Women celebrated her return through secret rituals, fasting and feasts. The aim was to bring abundance and fertility to women.

People still celebrate a harvest festival after June. In the province of Hatay, a festival named *evvel temmuz* (early July, the beginning of July in the Rumi calendar), is celebrated for the next harvest to be fertile. On the 14th day of July, after purification in the Mediterranean Sea, people visit the Khidr Tomb (*Hızır Türbesi*) in Samandağ where the prophets Khidr and Moses are believed to have met.[76] During this activity people invoke prayers, offer animals and consume collectively. Although the first harvest and planting the second crop, and rituals related to the cult of the dead were carried out in this month, only a few Early Bronze Age graves and a few Middle Bronze Age graves in Çavlum and Gordion are oriented towards the rising sun during this month.

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69 KlPauly 5:650-51, s.v. "Thargelia"

70 Özergin 1969.

71 Cohen 1993, 315-19.

72 Cohen 1993, 23-29.

73 Hoffner 1974, 24-26.

74 Hazenbos 2003, 112; Demirel 2017, 26.

75 Thomson 1983, 248; Sina 2004, 44, 47-49.

76 After Vatfa Çolak, 90, Harbiye/Antakya, transmitted by her grandson İbrahim Tayfur Aşkar.

Last Harvest - the Fifth Month of the Year (July-August)

In the Anatolian folk calendar, August is called the month of "Harvest/Meadow" or "Harvest Heat" (*Harman/Çayır Ayı, Harman Sıcağı*).[77] In Mesopotamia, crops ripened and were harvested in the month of *Abūm* as blessed by the sun god ^{d}*Šamaš*. In this context, the feast of *Abu(m)* was celebrated.[78] In the first half of the 2nd millennium BC, rituals were carried out at the entrances of tombs on particular days of this feast, indicating the association of harvest with the cult of the dead.[79] The fifth month of the calendar used between 2600-2000 BC is *Ga-sum* (wool shearing). Thus, it is suggested that sheep were sheared in this month.[80] The month *Hubur* (month of the underworld) in the same calendar bears the name of the river *Hubur*, which was crossed into the underworld and thus indicates festivities associated with the cult of the dead.[81] The ancient Greeks celebrated two different festivals associated with the underworld during the month of *Hekatombaion*. The *Synoikia* was held on the 16th-17th days and the *Panathenaia* on the 28th day.[82]

The evidence examined in this study shows that only a very modest number of the Early Bronze Age graves and the Middle Bronze Age graves at Gordion and Yanarlar are oriented towards the rising position of the sun during this month. This suggests a relationship between harvesting and the "death" of plants. However, this orientation is not common.

Vine Harvest - the Sixth Month of the Year (August-September)

In Mesopotamia, rituals and sacred marriage ceremonies were organized for the sky god ^{d}*Anu* and the fertility goddess ^{d}*INANNA*[83] before the fall equinox in the month *Ulūlu/Elūlu*. The sixth month of the calendar used between 2600-2000 BC is *I.NUN.NA-at* (butter). This indicates that milk products were processed during this month.[84] In the Hittite world, the ^{EZEN}*nuntarriyašhaš* (Speed/Haste) festival was celebrated at the autumn equinox.[85] Celebrated in autumn when the king returned from the campaign, this feast was associated with harvest. Another Hittite festival associated with harvesting and rain-making rituals was ^{EZEN}*KI.LAM*, celebrated with offerings made for the grain god ^{d}*ḫalki* in autumn.[86]

The grape harvest festival ($^{EZEN.GIŠ}$GEŠTIN/*tuhšuwaš*) was dedicated to the Hittite storm god.[87] The ancient Greek *Pythia* festival, celebrated in the month *Metageitnion*, must also be considered in this context.[88] The ninth month of the calendar used between 2600-2000 BC was *MAxGANAtenu-sag*, while the tenth month, *MAxGANAtemû-úgur*, means "ripe fruit" and "harvest".[89] Although climatic conditions show variations on a regional basis, vineyards

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77 Özergin 1969.

78 Hasluck 1929, 319-20; CAD 1(I), 2, 67, 73; Black et al. 2000, 3.

79 Abusch 1974, 252; Cohen 1993, 259-61, 319-21, 454-55; Ökse 2005.

80 Cohen 1993, 23-29.

81 Cohen 1993, 237-47.

82 Sina 2015, 43-44.

83 CAD 4, 136; Cohen 1993, 321-26.

84 Cohen 1993, 23-29.

85 Haas 1994, 827; Nakamura 2002.

86 Singer 1984, 127; CHD L-N, 473; Haas 1994, 748.

87 Demirel 2017, 29, table 1.

88 Sina 2015, 86.

89 Cohen 1993, 23-29.

are harvested from the beginning of September to mid-October in Anatolia. During festivities held throughout the vine harvest (*Bağ Bozumu*), people enjoy and consume food collectively. Although it is assumed that harvesting and the shedding of leaves in autumn would have implicitly been correlated with death, only a small portion of Early Bronze Age graves and a few Middle Bronze Age burials in Çavlum appear to be oriented towards the rising position of the sun during this month.

Planting - the Seventh Month of the Year (September-October)

Having different climatic and ecological niches in Anatolia enable us to establish a broad timetable ranging from September to November for plowing fields and sowing seed. The seventh month of the year in Mesopotamia is *Tašrittu* (the beginning of time, courageous *Šamaš*), which begins with the first new month after the fall equinox.[90] On the first night of this month, people celebrated the "Opening/Beginning Day", and seeds were sown in the fields.[91] In the same way, the ancient Greek festival of *Makra Mysteria* (Great Mysteries) started on the 15th of *Boedromion* and lasted seven or nine days.[92]

Nearly one quarter of the Early Bronze Age graves and half of the Middle Bronze graves at Yanarlar were oriented towards the rising position of the sun during this month. This suggests that the dead were laid into the earth like seeds.

Planting - the Eighth Month of the Year (October-November)

In Mesopotamia, the "*akītu* feast of sowing" is celebrated in the month of *Alahšamnu/Arahšamna*.[93] In a similar vein, following the harvest, the Hittites celebrated the feasts of Threshing Sledge (^{EZEN}*hahrannaš*), Crop Sheaving (^{EZEN}*harpaš/harpiya*), and Crop Binding (^{EZEN}*šeliyaš*).[94] The ancient Greeks celebrated the *Pyanopsia* Festival on the 7th day of *Pyanopsion*, a month dedicated to Apollo. During the *Thesmophoria* festival on the 11th-13th days of this month, women sowed the fields and rituals progressed in secrecy in order to increase fertility and impregnation in the frame of the Demeter cult.[95] During the *Proerosia* (preparing the soil for ploughing) festival dedicated to Demeter, phalluses were stuck in the soil to provide fertility and to germinate the crops in spring.

Approximately one quarter of the Early Bronze Age graves and some of the Middle Bronze Age graves at Yanarlar were oriented towards the rising position of the sun during this month. Then the harvested crops were processed, and the fields were plowed and prepared for the new agricultural year. The density of graves oriented in this direction seems also to be related to the dead buried in the earth like seeds.

Mating - the Ninth Month of the Year (November-December)

In Anatolia, bucks and rams joined the flocks of sheep and goats (*koç katımı*) in November so that they could breed. Lambs were born in the spring after a five-month gestation. In

90 Cohen 1993, 326-30; Horowitz 1996, 36-37; CAD 18, 297.

91 Black et al. 2000, 402.

92 Eliade 2007, 363.

93 Cohen 1993, 331-32.

94 CHD P, 88; Demirel 2017, 29, table 1.

95 Thomson 1983, 245; Sina 2015, 44-45.

Mesopotamia, rituals were organized for ^{d}*Nergal*, the god of the underworld, in the month of *Kislimmu* to celebrate the end of crop processing and the impregnation of sheep and goats.[96] In Anatolia, this event is still celebrated collectively in November.[97] Henna is applied to rams, colored rags are bound to the horns, and banquets accompanied with various drinks and native music are organized.[98]

Approximately one quarter of the Early Bronze Age graves, a large portion of the graves at Beşiktepe, and a portion of the Middle Bronze Age graves at Gordion were oriented towards the rising positions of the sun during this month. This suggests a simulation of the dead with offspring waiting to be born.

Early Winter - the Tenth Month of the Year (December-January)

Days get longer after the winter solstice, and the days when the seeds will sprout and the offspring will be born are approaching. In Mesopotamia, *Ṭebētu*, the month of severe cold, is dedicated to *Papsukkal*, the vizier of ^{d}*Anu* and ^{d}*İštar*.[99] During this month, rituals were carried out for ^{d}*Anu* within the feasts of *Kinūnu* (brazier) and *Nabrû*.[100] During the ancient Greek month *Poseidon*, the hardest month in winter, the *Haloa* (fruit trees) festival was celebrated at Eleusis on behalf of Demeter and her daughter Persephone. During these festivities women performed secret rituals and carried phalluses to ensure the growth of seeds and fertility.[101] One quarter of the Early Bronze Age graves, and a large portion of the Middle Bronze Age graves at Beşiktepe and Gordion are oriented towards the rising positions of the sun during this month. This reveals that the dead, like seeds and offspring, are waiting to attain life in the spring.

Mid-Winter - the Eleventh Month of the Year (January-February)

The Mesopotamian frost month *Šabātu* is associated with divine marriages in Babylonian mythology:[102] ^{d}*Nabû* with ^{d}*Tašmētu* and ^{d}*Bēl* with ^{d}*Bēltiya*. The pregnancy of sheep might have inspired the mythologies of these divine marriages. In this month, feasts were celebrated in honor of ^{d}*Enlil*. The eleventh month of the calendar used in Anatolia during the Assyrian Trade Colonies Period - *Kuzallu* (shepherd month) - seems to have been associated with stock breeding.[103] The ancient Greeks defined the month of *Lenaion* as the month of marriage. The *Lenaea* Festival was celebrated as the revival of vegetative life.[104]

In Anatolia and Iran, several communities believe that lambs begin to move and become hides in the womb one hundred days after insemination. They perform a seasonal feast, *Saya Gezme*, in this context.[105] During this feast, shepherds or children collect food from all houses

96 CAD 8, 429; Cohen 1993, 333-34; Black et al. 2000, 402.

97 And 1985, 143.

98 Kalafat 2005, 196; Konya Ereğli region after Assoc. Prof. Dr. Meryem Gürbüz; Bitlis, Muş and Ağrı after Salih Çiftçi, 55, transmitted by his daughter Şeyma Çiftçi; Karacadağ region after Fatima Ekinbaş, 76, transmitted by her daughter Özlem Ekinbaş.

99 CAD 19, 66.

100 Cohen 1993, 335-37, 392-93.

101 Eliade 1994, 343; Sina 2004, 47-48.

102 CAD 17(I), 8; Cohen 1993, 337-39.

103 Cohen 1993, 237-47.

104 Yücel 2015, 156-57.

105 Boratav 2003, 268.

of the village, eat these all together, and sing folk songs.[106] One quarter of the Early Bronze Age graves and some Middle Bronze Age graves at Yanarlar are oriented towards the sunrise during this month. The density of this orientation may be related to fetuses waiting to be born and the dead approaching life.

End of Winter - the Twelfth Month of the Year (February-March)

In the Anatolian folk calendar, from the 100th day of *Kasım Günleri* (November days), that is, from 8th November-5th May) onwards, the days are getting longer, the weather is warming up, and spring is stepping up. This phenomenon is defined as "heat falls into air" (*havaya cemre düşüşü*) on 19th/20th February, into water (*suya cemre düşüşü*) on the 26th/27th February, and into earth (*toprağa cemre düşüşü*) on the 5th/6th March.

Mesopotamian feasts held in honor of ^{d}*Enlil* continued in the month *Addaru*, and people mourned during the *qarrātu* feast .[107] The last month of the calendar used during the Assyrian Trade Colonies Period is *Allanātu* (the acorn month).[108] The only winter holiday of the Hittites, ^{EZEN}*gimmant*, was probably celebrated in this month.[109] In the Roman period, the *Anthesteria* Festival was held in honor of *Faunus* on the 15th day of *Anthesterion* (blooming flowers).[110] Then people performed purification rituals and *hieros gamos* (sacred marriage) for fertility,[111] along with rituals for ensuring the souls of the dead returning to life. Vines were pruned, and wine was ready for consumption during the *Mikra Mysteria* (Persephone Mysteries) when people fasted, held purification rituals, and made offerings to the gods.[112] Rituals were held in honor of Bacchus' resurrection in the spring.[113] The orientation of one quarter of the Early Bronze Age graves and half of the Middle Bronze graves at Yanarlar towards the rising positions of the sun during this month suggests that the resurrection of the dead may have been simulated in the same sense.

Conclusion

Although the burials do not illustrate the same directions in the extramural cemeteries excavated in Anatolia, orientations towards the sunrise come to the forefront (fig. 10).

As noted above, the positions of the rising sun from the spring equinox to the summer solstice and back to the autumn equinox are occasionally associated with harvest and offspring. Several festivities were held in Anatolia and Mesopotamia to celebrate several cycles of agricultural products. The orientations of Early and Middle Bronze Age graves handled in this study revealed a lack of preference for these directions for the deceased. Burials facing the sunrise positions in equinoxes are rare, thus indicating that the beginning of the New Year (*akītu* feast) was not much related to death. The preference of sunrise between the equinox and the summer solstice in Yanarlar, the summer solstice in Tatıka and Çavlum, and the commemorative

106 And 1985, 144; Düzgün 2005.

107 CAD 1(I), 110-11; Cohen 1993, 340-42.

108 Cohen 1993, 237-47.

109 Demirel 2017, 29.

110 Estin and Laporte 2005, 105; Sina 2015, 49-50.

111 Erhat 1993, 113.

112 Eliade 2007, 362.

113 Dürüşken 2000, 84.

ceremonies held at the summer solstice in Mesopotamia may suggest a mentality that wishes to simulate light prevailing over darkness and life prevailing over death. Moreover, the practice of rituals at the gate of the tombs during the harvest festival in the month of *Abūm* in Mesopotamia suggests that death might have been identified with harvest. However, the sunrise positions during these months are also not preferred much in cemeteries.

Yet most of the burials are oriented towards the rising positions of the sun between the autumn equinox and the winter solstice in both ages. In Gre Virike, Aşağı Salat, Elmalı-Karataş and Babaköy, the burials are oriented towards the sunrise during one month following the autumn equinox. In this month, people sow in fields the seed that will sprout in the spring, suggesting a simulation of the dead with the seeds buried in fields. In Mesopotamia, this event is celebrated in the month of *Tašrittu* with festivals. The Greek and Roman world celebrated *Makra Mysteria*. In the Middle Bronze Age cemeteries at Gordion, Çavdartepe, Kusura and Sarıket, the sunrise positions between the equinox and the winter solstice (23rd September-21st December) are preferred mostly. Also, animals mate before the winter solstice, and this event is celebrated in the month of *Kislimmu* in Mesopotamia. This again suggests a simulation of the dead with the offspring in the womb. The seeds and the offspring await coming to life during the three months from the winter solstice to the spring equinox.

The rhythmic nature of "sleeping" or "dying" in autumn and "reviving" in spring seems to have ensured the simulation of the dead with seeds waiting to sprout under the ground as well as the offspring waiting to be born in the womb during the winter months. The ancient Near Eastern tradition of spreading grain on the grave[114] might also have been a way to ensure the revival of dead souls in the spring. Thus, the burials facing the sunrise positions during the winter months may have symbolized the "waiting" of the dead to start a new life in the underworld. This practice can also be considered a reflection of the wishes for starting a new life at the end of the night. In daytime, all plants open their flowers and animals are active, while at night flowers close and animals sleep. Therefore, people might also have considered sleeping during the night as a temporary death.

Not all cemeteries in Anatolia are expected to support these results. Although it is conceivable that the orientation of burials towards the rising sun may be based on the location of the sun on the day of burial, the uneven distribution of orientations weakens this possibility. Topographic features or sacred elements such as the sea, mountains or open-air temples may also have played a role in the orientations of burials. However, in order to develop this point of view, field observations are required.

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[114] Taracha 2000, 174.

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Makale Geliş / Received : 28.09.2019

Makale Kabul / Accepted : 28.01.2020

TABLE 1 Agricultural calendars.

	AGRICULTURAL CALENDARS					
	Agricultural Process	**Sumerian Calendar**	**New Assyrian Calendar**	**2600-2000 BC Calendar**	**Ancient Greek Calendar**	**Anatolian Folks' Calendar**
March	Offspring	^{ITI}*BARAG*	*Nisannu*	*Za'atum*	*Elaphebolion*	*Döl Dökümü,* *Kuzu Ayı,* *Yazbaşı*
April						
May	Offspring, Planting	^{ITI}*GUD*	*Ajaru*	*Gi-um*	*Mounikhion*	*Abrul,* *Yağmur ayı*
June	Wool Shearing, Fruit Harvest	^{ITI}*SIG*	*Simannu*	*Ḫalida*	*Thargelion*	*Çiçek ayı,* *Tut ayı*
July	Early Harvest	^{ITI}*ŠU*	*Du'uzu* *Tam(m)uzu*	*Irísá*	*Skirophorion*	*Yayla ayı* *Kiraz ayı*
August	Second Planting	^{ITI}*NE*	*Abūm*	*Ga-sum*	*Hekatombaion*	*Kotan ayı,* *Orak ayı*
September	Second Harvest	^{ITI}*KIN*	*Ulūlu* *Elūlu*	1.*NUN.NA-at*	*Metageitnion*	*Biçim ayı,* *Çürük ayı*
October	Field Sowing	^{ITI}*DU*	*Tašrittu*	*Za-LUL*	*Boedromion*	*İlk Güz,* *Harman ayı,* *Üzüm ayı*
November	Field Sowing, Animal Pregnancy	^{ITI}*APIN*	*Alahšamnu* *Araḫšamna*	*Ibasa*	*Pyanopsion*	*Orta Güz,* *Değirmen ayı,* *Gazel ayı*
December	Field Sowing	^{ITI}*GAN*	*Kislimmu*	*MAxGAN* *Atenu-sag*	*Maimakterion*	*Son Güz* *Koç ayı*
January	Early Planting	^{ITI}*AB*	*Ṭebētu*	*MAxGAN* *Atemû-úgur*	*Poseidon*	*Karakış* *Nahır kovan*
February	Early Planting	^{ITI}*ZIZ*	*Šabātu*	*Kuzallu*	*Gamelion*	*Zemheri,* *Don ayı*
March		^{ITI}*ŠE*	*Addaru*	*Allanātu*	*Anthesterion*	*Göcük*

TABLE 2 Agricultural festivals.

	AGRICULTURAL FESTIVALS					
	Ancient Mesopotamia		Ancient Anatolia		Ancient Greek/ Rome	Folks' Calendar
March	First product & offspring	*Akītu*	*AN.TAH.ŠUM Purulliya* (growth)	*ḫewaš* (rain) *Tetḫešnaš* (thunder)	*Megalensia, Hilaria*	*Çiğdem Günü* (crocus day), Nawruz
April						
May	^{d}*Nabû* and ^{d}*Tašmētum* wedding	Donkey/ Warm Month				*Hıdrellez*
June		Mudbrick Production	*ŠU.KIN.DÚ* (siecle)		*Thargelia*	
July	^{d}*Dumuzi*	Mourning Ceremonies	*Ú.BURU, BURU*$_{14}$ (harvest) *GURUN* (fruit)	*Ḫubur* ayı (cult of the dead?)	*Skira, Kalligeneia*	*Evvel Temmuz* (Ere July)
August		*Abum* (harvest)		*I-rí-sá* (sowing)	*Synoikia, Panathenaia*	Harvest
September	^{d}*Anu* ile ^{d}*INANNA*	*Hieros gamos*	*nuntarriyašḫaš KI.LAM*	*Ga-sum* (shearing) *GEŠTIN, tubšuwaš* (wine), *1.NUN.NA-at* (butter)	*Pythia*	*Bağ Bozumu* (Vintage)
October	Courageous *Šamaš*	Beginning	*ḫaḫrannaš* (threshing), *ḫarpaš, ḫarpiya* (bundling), *šeliyaš* (gathering)		*Makra Mysteria*	Planting
November		Sowing Fields			*Proerosia, Pyanopria, Thesmophoria*	*Koç Katımı* (rams join flocks)
December	^{d}*Nergal*	Pregnancy				Pregnancy Celebrations
January	*Papsukkal* (vizier of ^{d}*Anu* and ^{d}*Ištar*)	*Kinūnu* (Brazier) *Nabrû*		*gimmant*	*Haloa*	
	^{d}*Nabû* and ^{d}*Tašmētu* wedding ^{d}*Bēl* and ^{d}*Bēltiya* wedding		*Kuzallu* (Month of Herdsman)		*Lenaea*	*Saya gezme*
February	Mourning	*Qarrātu*	*Allanātu* (acorn month)		*Mikra Mysteria, Anthesteria*	
March						

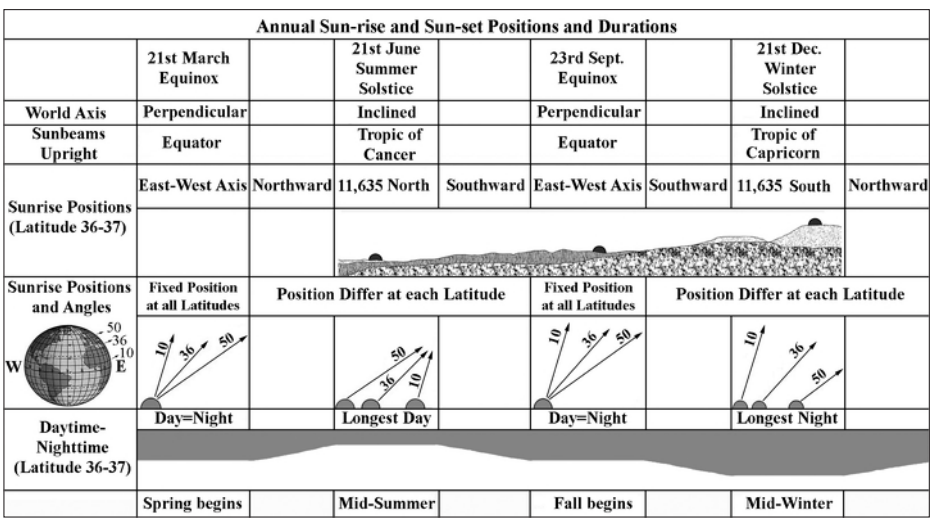


FIG. 1 Annual sunrise and sunset positions and durations.

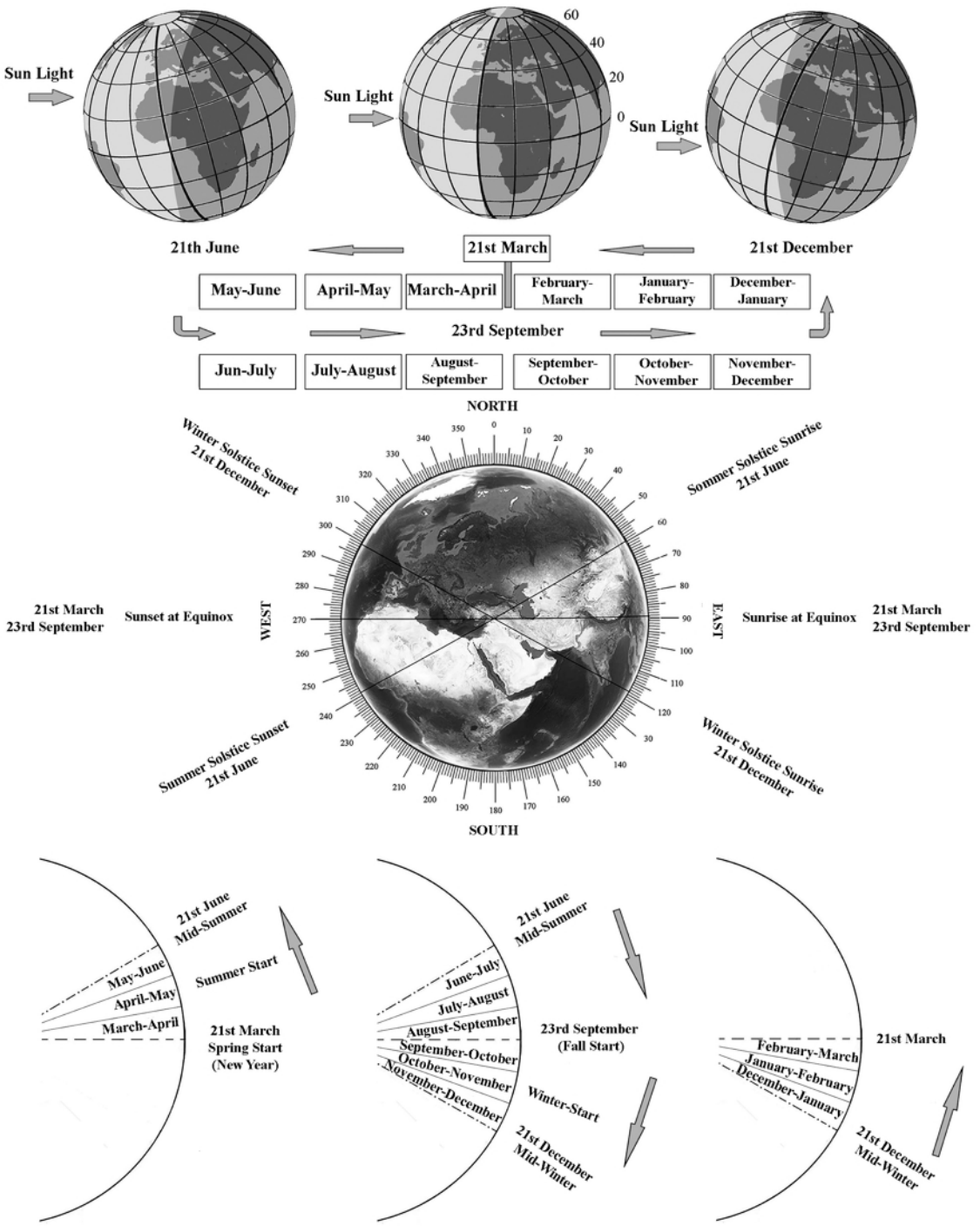


FIG. 2 Seasons according to the annual oscillation of the Sun.

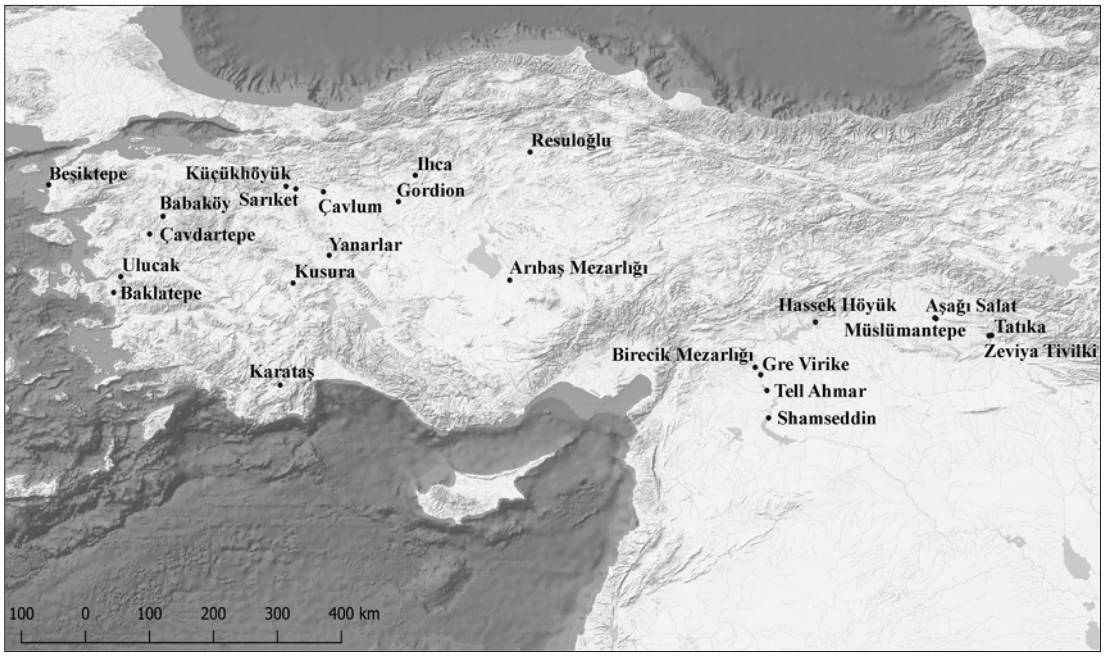


FIG. 3
Early and Middle Bronze Age cemeteries (Map: Şakir Can).

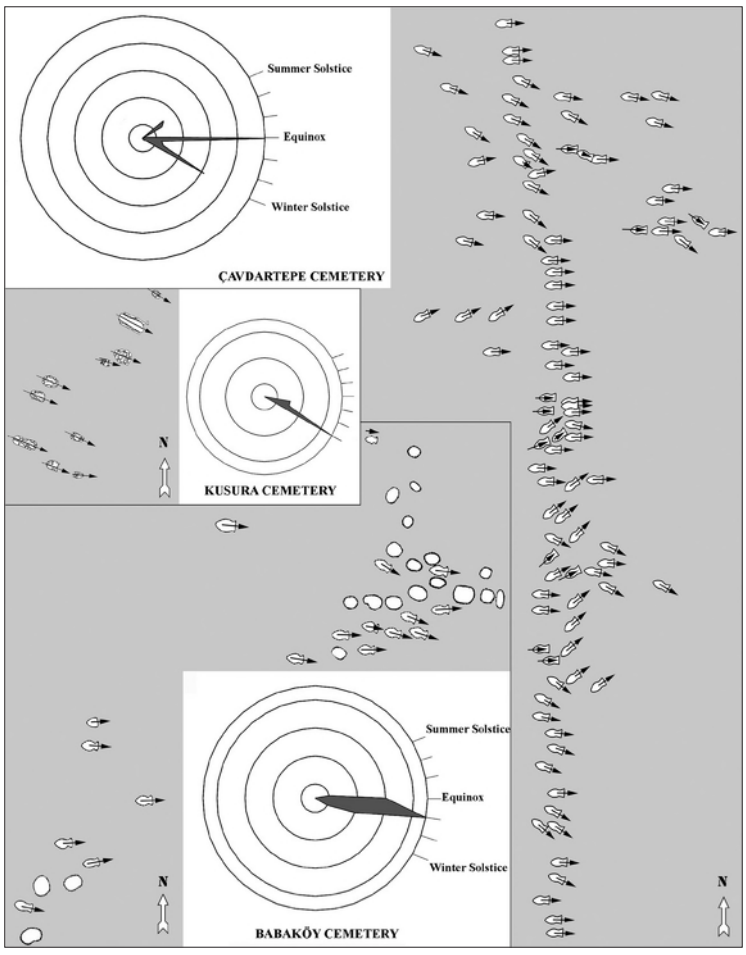


FIG. 4
Orientation intensity in Early Bronze Age cemeteries Çavdartepe (prepared after Kamil 1982, fig. 12), Babaköy (prepared after Bittel et al. 1939-41, 5), Kusura (prepared after Stewart 1936, fig. 25).

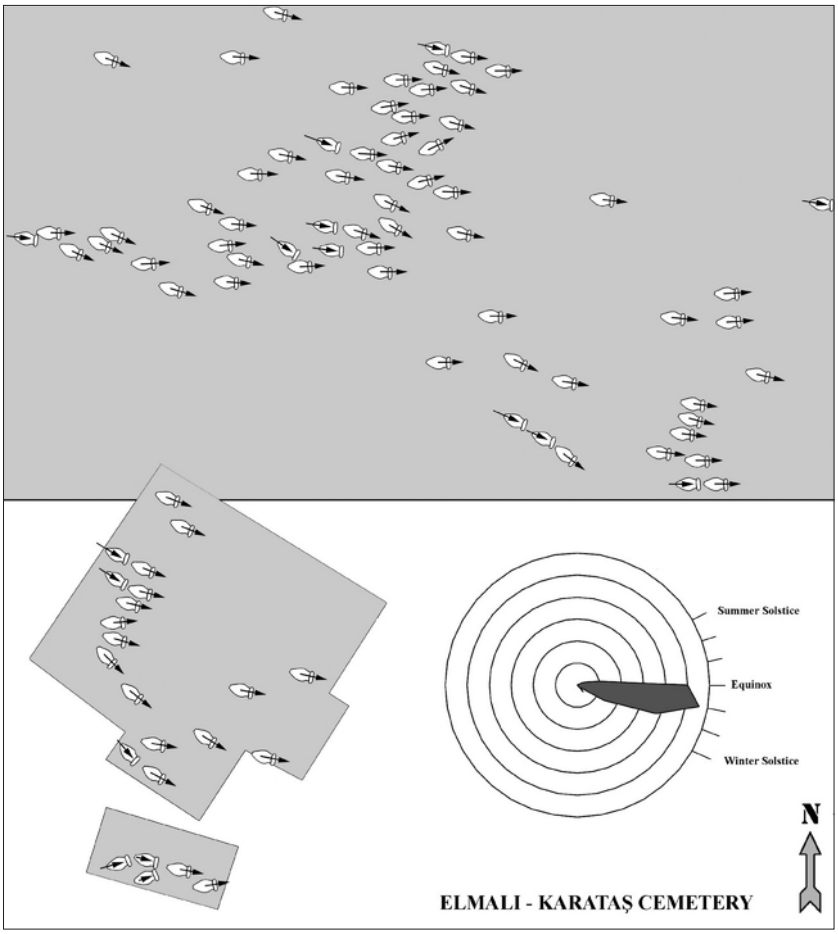


FIG. 5
Orientation density in Early Bronze Age cemeteries Elmalı-Karataş (prepared after Warner 1994, pls. 22, 55, 56).

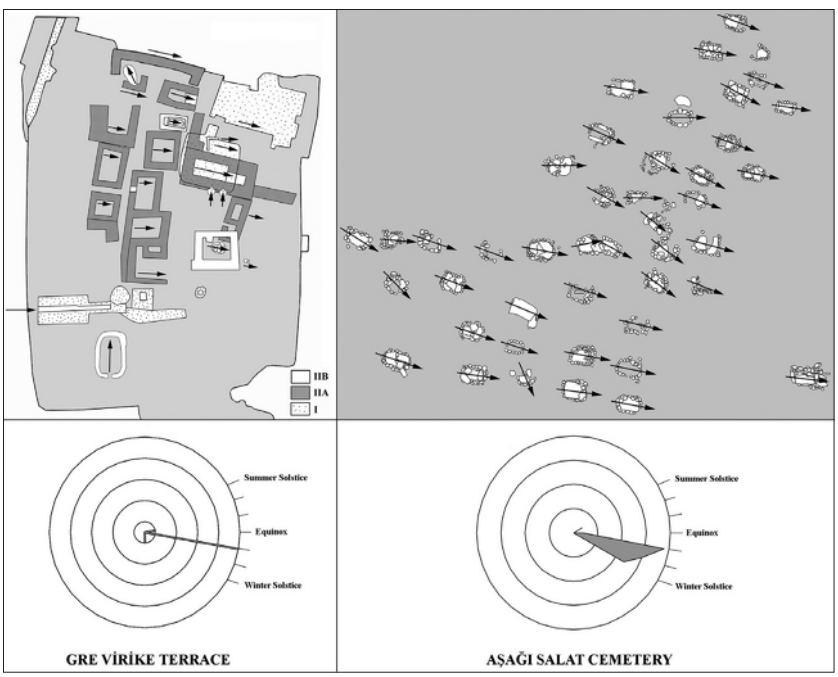


FIG. 6
Orientation density in Early Bronze Age cemeteries Gre Virike (prepared after Ökse 2006a, 2006b, 2006c), Aşağı Salat (prepared after Akçay 2017, fig. 4).

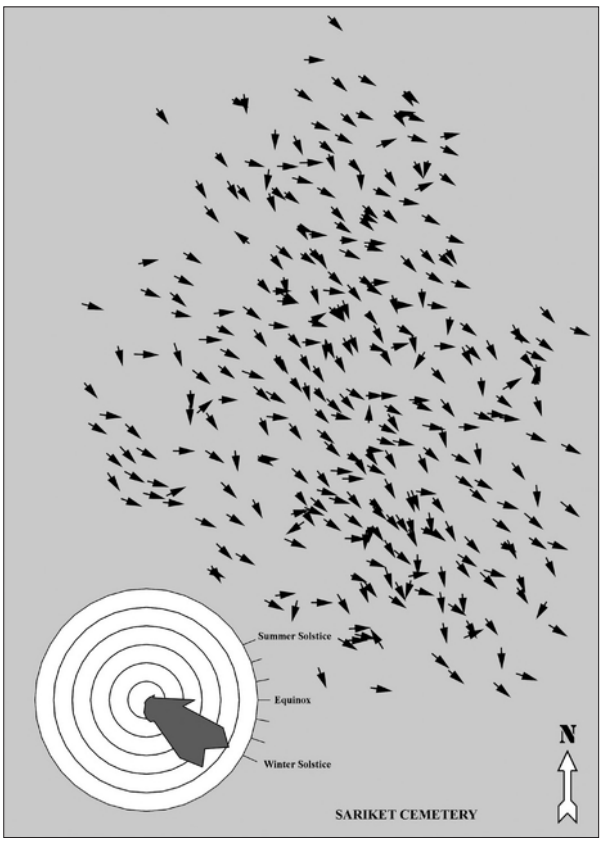


FIG. 7
Orientation density in Early Bronze Age cemeteries Sarıket (prepared after Massa 2014, fig. 5).

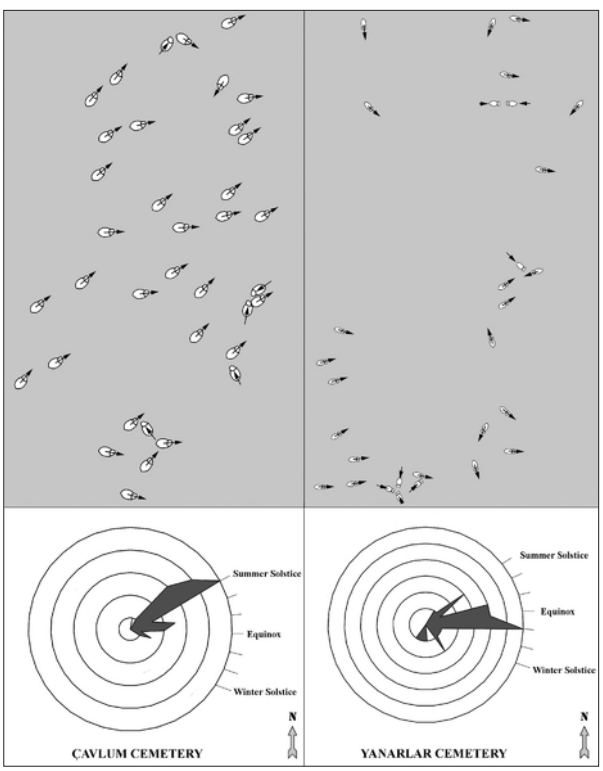


FIG. 8
Orientation density in Middle Bronze Age cemeteries Çavlum (prepared after Bilgen 2005, pl. XCII), Yanarlar (prepared after Emre 1978, pl. 2).

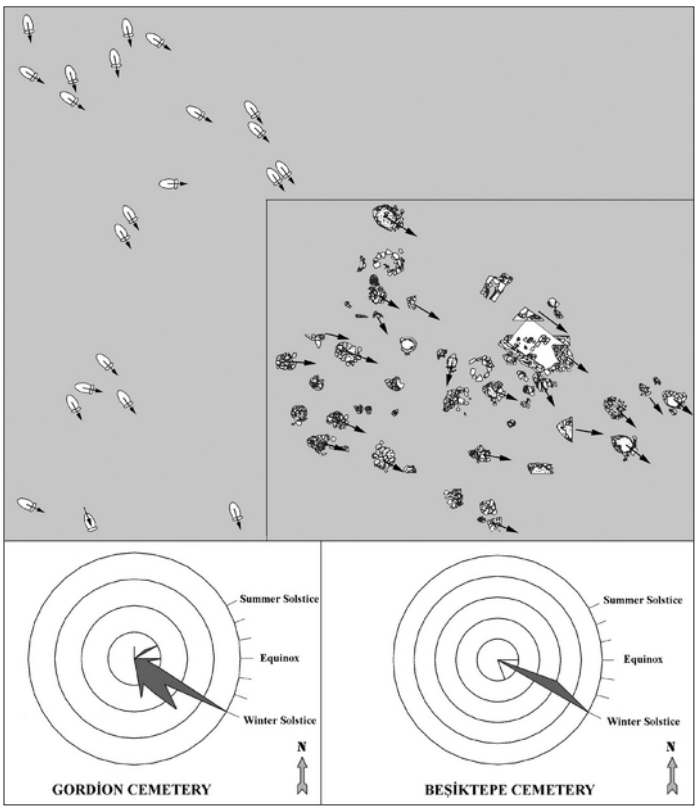


FIG. 9
Orientation density in Middle Bronze Age cemeteries Gordion (prepared after Mellink 1956, pl. 1), Beşiktepe (prepared after Korfmann 1986, fig. 6).

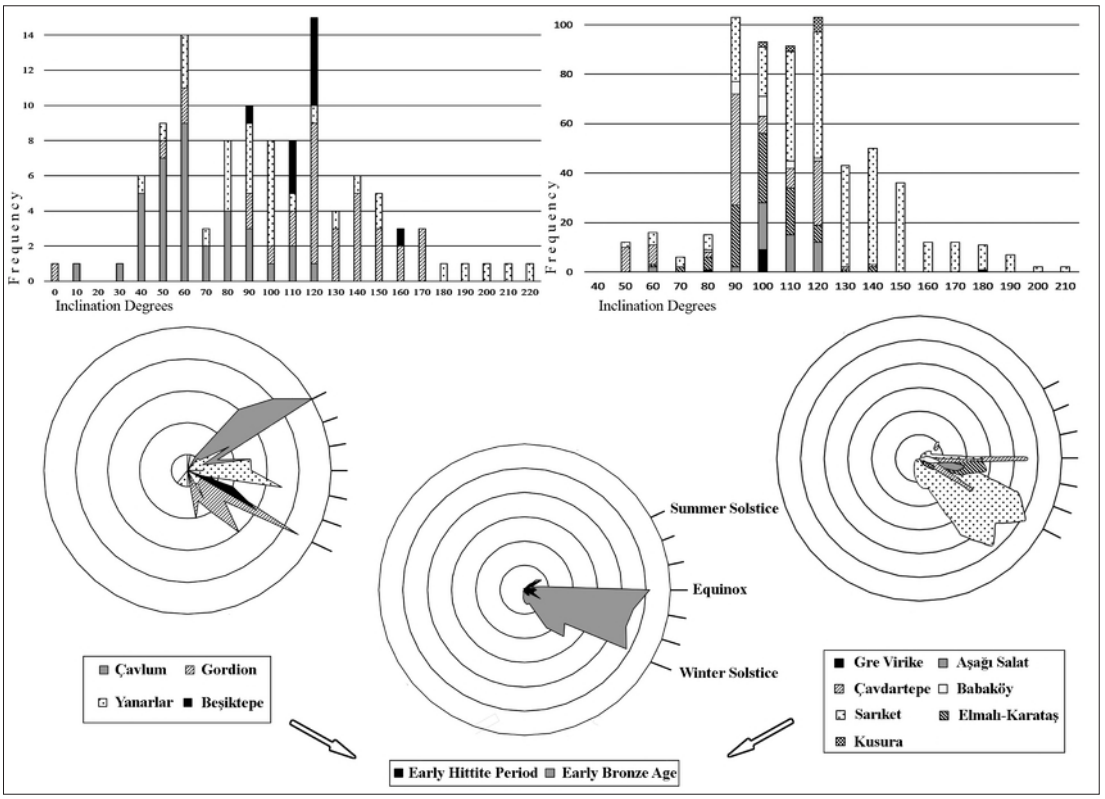


FIG. 10
Density of orientations in Early and Middle Bronze Age cemeteries.