The orientation of graves from the Period of the Hungarian Land Conquest

E. Zsoldos, B. Szeidl

Konkoly Observatory, Budapest

Abstract

The orientation of graves in seven cemeteries from the Period of Land Conquest (10^{th}–11^{th} c.) were measured. The distribution of the angles strongly suggests that the pits were aligned by the direction of daily sunset/sunrise.

Before the "invention" of light pollution, men had a more intimate connection with the sky. The sky, for example, provided events which could be used to construct a calendar.

Another case of the effect of the sky on the everyday life (and death) of our ancestors is connected to the various burial rites. The rites themselves are not known but their result, i.e. cemeteries, standing stones, various types of buildings show it through their orientation. It seems quite certain that already Neolithic or Copper Age people used the sunrise/sunset for the time of burial (Barlai 1980, Barlai et al. 1992, Heggie 1982, Schlosser & Čierny 1982).

A promising field of investigation is the orientation of graves in cemeteries from the Period of Hungarian Conquest (10th century). There are several well documented cemeteries (e.g. see Fodor et al. 1996), a few of them were used for the present paper. An earlier attempt by Csalog (1967) focused on other than astronomical sides of the question. A few years later Dienes (1974), however, convincingly argued against Csalog's conclusions.

The measurements were made on the maps with an angle-measuring instrument (the maps are from Fodor et al. 1996). We both measured the angles (West was 0°, North was 90°). The difference between the two sets of measurements were rather small (difference (EZS−BSZ)=$0\overset{\circ}{.}48$). Since both the error of the digging of the grave and that of measuring the angle by the archaeologist could produce significantly larger error (Barlai 1980, Barlai & Bognár-Kutzián 1995), the above small systematic error was neglected.

Figures 1a–g show the result of the measurements. Notes on individual cemeteries:

- **Sóshartyán-Hosszútető** (Fig. 1a): The cemetery contains the graves of the 'middle-class' of the conquerors (Fodor et al. 1996). The orientation angles show a more or less even distribution around 25–30°, implying that the cemetery was used mostly during the summer.

- **Karos II–III** (Fig. 1b-c): The Karos cemeteries are part of a princely burial place (Fodor et al. 1996). Karos II was the earlier, but both II and III belonged to the same ethnic group (i.e. Hungarians) (Révész 1996). Karos II shows the kind of distribution of angles which is most naturally explainable by burial at the daily sunrise/sunset (in contrast to a burial at a fixed — e.g. the Sun at the vernal equinox — orientation). The small number of graves at Karos III makes it impossible to draw conclusions.

- **Aldebrő-Mocsáros** (Fig. 1d): The cemetery belonged to the wealthier free class (Fodor et al. 1996). Here, again, the number of graves is too small. Nevertheless, the distribution seems to be the same as in the case of Karos II.

- **Sárrétudvari-Hízóföld** (Fig. 1e): This is a very large cemetery, belonging to the first generation of conquerors (M. Nepper 1991). It shows nicely the W–E orientation of the graves. The base of the diagram is, however, much larger than the solar arc.

- **Tiszafüred-Nagykenderföldek** (Fig. 1f): The graves show the same distribution as in Karos II. The solar arc is filled in.

- **Ibrány-Esbóhalom** (Fig. 1g): This cemetery proved to be the most interesting among the seven. It is on a small, 3.5 m high oval sand hill running from south to north (Istvánovits 1996). It fills in the solar arc, and is oriented in the same way as Karos II. The peak in Fig. 1g, however, is doubled. The reason for this is apparent from the map of the cemetery (Fig. 8 in Istvánovits 1996, Plan 6 in Fodor et al. 1996). The earlier graves (10th century) were digged in the western side of the hill, while the later (early 11th century) ones found place only on the eastern and northern side. Those dug in the eastern side had a horizon several metres higher than the ones in the western sides (or vice versa). Supposing graves were digged at sunset (but it works in the opposite direction, too) the eastern diggers saw the sun disappear earlier (because of the higher horizon), and therefore their graves were oriented more to the south.

There are some other interesting features of the cemeteries. In two cases — Ibrány-Esbóhalom and Aldebrő-Mocsáros — there are graves with greatly different orientation angles. The reason for this, in the former case at least, was the different ethnicity of the deads (Istvánovits 1996).

Ibrány-Esbóhalom deserves more attention. Figure 2a-d shows the orientation of the different components of this cemetery. Istvánovits (1996) divided it into three parts:

1. The lowest line on the western slope, it is the earlier part of the cemetery. The orientation is shown on Fig. 2a.

2. The other western graves. See Fig. 2b.

3. The eastern and northern graves. See Fig. 2c. (Fig. 2d is the total omitting the discrepant graves).

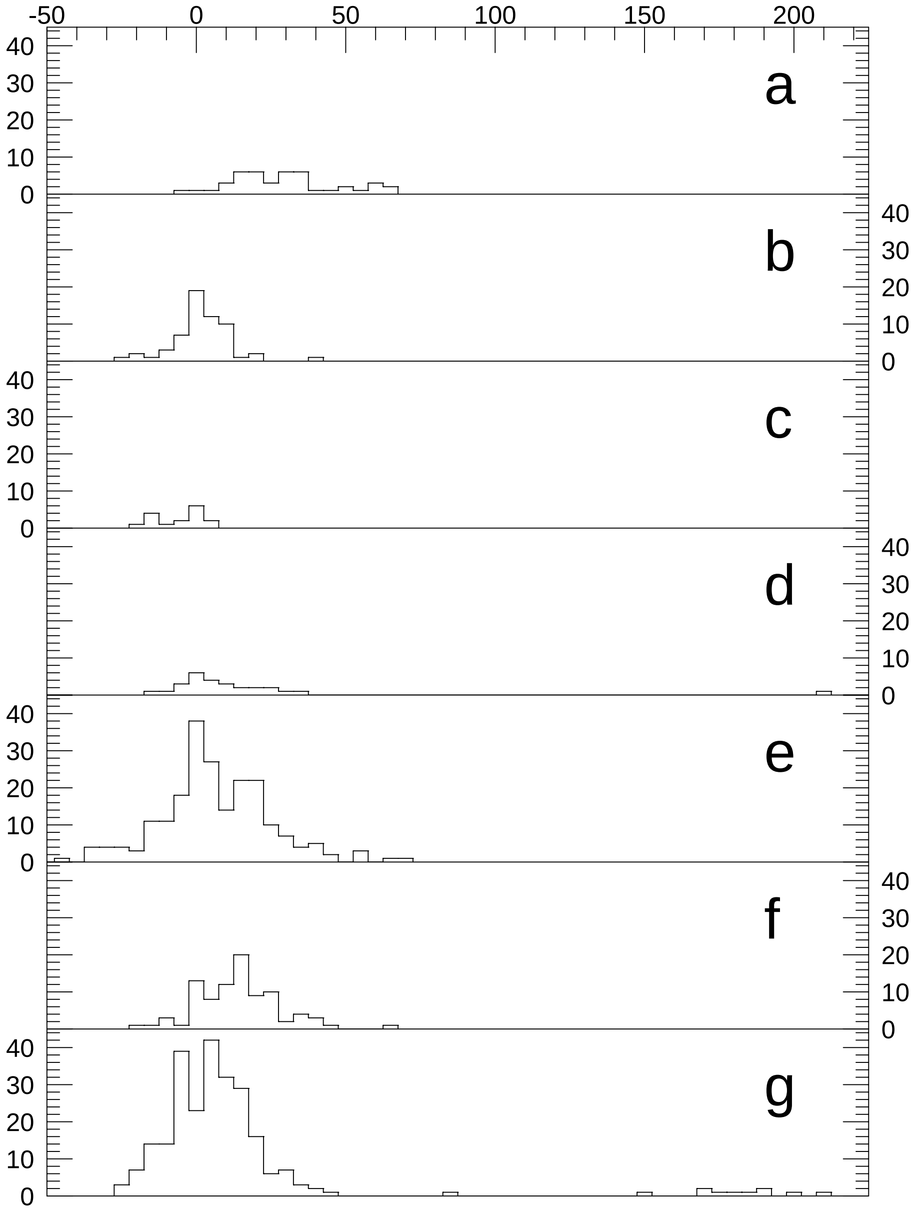

Figure 1: The orientation of graves in Conquest Period cemeteries. (a): Sóshartyán-Hosszútető, (b): Karos II, (c): Karos III, (d): Aldebrő-Mocsáros, (e): Sárrétudvari-Hízóföld, (f): Tiszafüred-Nagykenderföldek, (g): Ibrány-Esbóhalom. West is at 0^{o}, North is at 90^{o}.

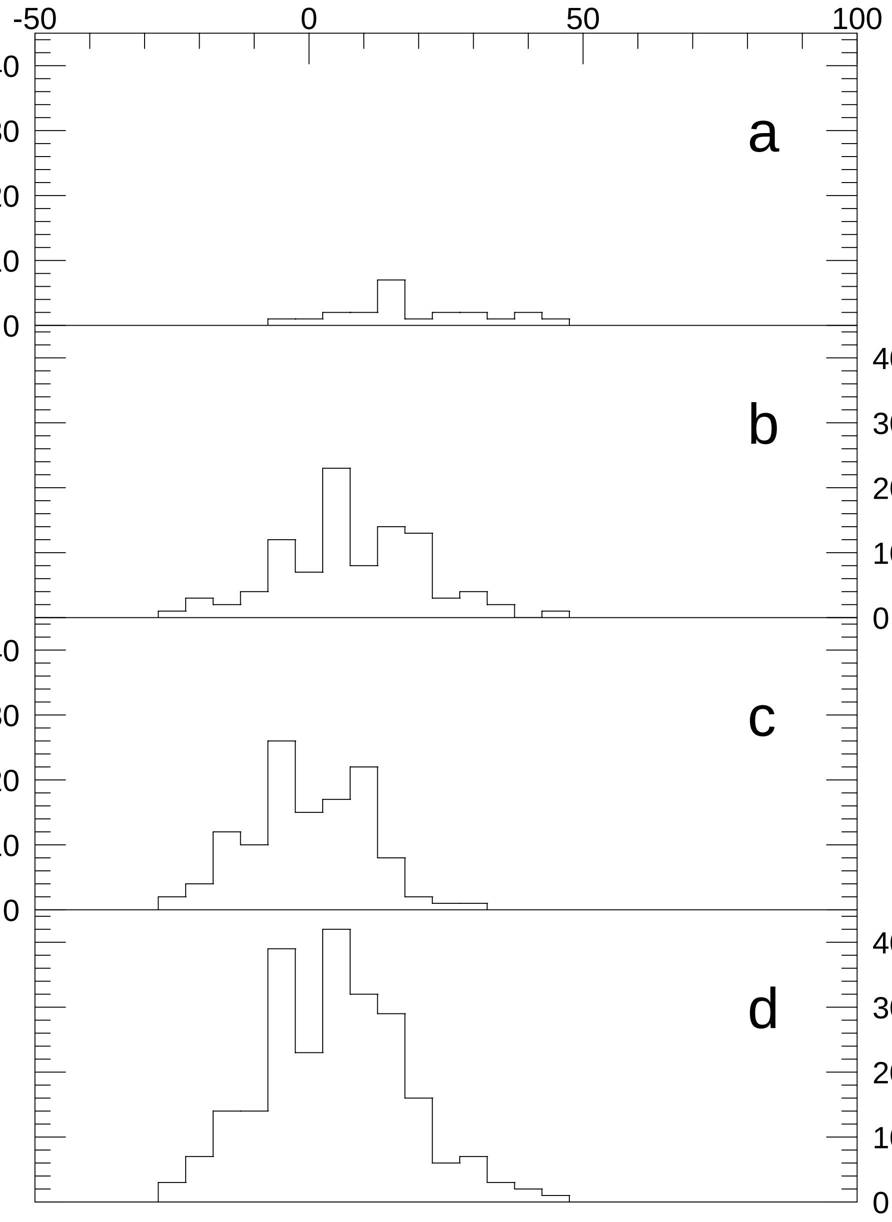

Figure 2: The orientation of the three components of Ibrány-Esbóhalom. See text for explanation.

The most western graves show the most northern orientation (either because they saw sunset at the lowest horizon or because they saw sunrise at the highest horizon). The second group is similar, their difference is not significant because of the small number of graves in the first group. Finally, the last (chronologically last, too) graves show a more southern orientation (either because they saw sunrise at the lowest horizon or because they saw sunset at the highest horizon).

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References

[1] Barlai K. 1980, 'On the Orientation of Graves in Prehistoric Cemeteries', *Archaeoastronomy Bulletin* **3**, No. 4, p. 29–32

[2] Barlai K., Bognár-Kutzián I. 1995, 'Patterns of Orientation in Neolithic Cemeteries', in *Archaeoastronomy from Scandinavia to Sardinia. Current Problems and Future of Archaeoastronomy 2.*, ed. E. Pásztor, Budapest, 1995, p. 25–32

[3] Barlai K., Bognár-Kutzián I, Zsoldos E. 1992, 'Rays of Prehistoric Sun', in *Readings in Archeoastronomy*, ed. S. Iwaniszewski, Warsaw, 1992, 11–19

[4] Csalog Zs. 1967, 'A IX–XI. századi magyarság gazdálkodásának és életformájának kérdéséhez', *Agrártörténeti Szemle* **11**, p. 228–240

[5] Dienes I. 1974, 'Hozzászólás (Mivel járulhat hozzá a néprajztudomány a honfoglaló magyarság életmódjának kutatásához?)', *Ethnographia* **85**, p. 587–591

[6] Fodor I., Révész L., Wolf M., M. Nepper I. (eds.) 1996, *The Ancient Hungarians*, Hungarian National Museum, Budapest, 1996

[7] Heggie D.C. 1982, 'Megalithic Astronomy: Highlights and Problems', in *Archaeoastronomy in the Old World*, ed. D. C. Heggie, Cambridge, 1982, p. 1–24

[8] Istvánovits E. 1996, '10.–11. századi temető Ibrány-Esbó halmon', in *A magyar honfoglalás korának régészeti emlékei*, szerk. Wolf Mária & Révész László, Miskolc, 1996, p. 25–46

[9] M. Nepper I. 1991, 'Sárrétudvari és környéke a XIII. századig', *A Bihari Múzeum Évkönyve* VI–VII, szerk. Módy György, Berettyóújfalu, 1991, p. 13–61

[10] Révész L. 1996 *A karosi honfoglalás kori temetők*, Miskolc, 1996

[11] Schlosser W., Čierny J. 1982, 'Astronomical Orientation of Neolithic Sites in Central Europe', in *Archaeoastronomy in the Old World*, ed. D. C. Heggie, Cambridge, 1982, p. 225–230