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Following my reply to Stapert (this volume) I had expected him to re-analyse the site and begin arguing from solidknowledge of the data. I still see no references to particulars or contextual information in Johansson's (1971; 1990) publications, nor do I see any test of the ring and sector method on independent ethnoarchaeological data.

As should be evident from my review, and to use his own phrasing, it manifestly is the ring and sector method and its application to Barmose I that amounts to conjectures without foundation.

His 'test' on two sections of Gönnersdorf (Bosinski, 1979), and his apparent claim that it is applicable to the vast range of site structures, features and sizes and shapes of dwellings from the Late Palaeolithic and Mesolithic of Central, western and northern Europe is unconvincing. Negative evidence plays an important role in support of his hypothesis of open air hearths or sites. We need solid information on the distributional trends across a considerably larger and broader selection of dwellings from different cultural and behavioural contexts before we may adequately assess the possible significance of variability in 'modalities' of associated artifact distributions. Even if we for discussion accept Stapert's 'test' on Gönnersdorf and accept that strong 'centrifugal effect' and bimodal distribution may be indicative of Gönnersdorf type dwellings, it does not necessarily follow that lack of 'centrifugal effect' and unimodal distribution indicate open-air hearths without dwellings! This also is one of the reasons why I wish to see such an allegedly universal method tested on ethnoarchaeological sites both with and without dwellings and open-air hearths.

In contrast, the method for delineating Maglemosian hut floors (Blankholm, 1981; 1984; 1987) never has been claimed applicable beyond Maglemosian contexts proper. In other words, it is culturally and behaviourally specific. Secondly, I have never claimed in Stapert's fashion that lack of indication of a typical Maglemosian hut floor would be indicative of an open-air Maglemosian hearth or site. That simply would be carrying things too far.

Stapert needs not be baffled about the use of the mean number of artifacts per square metre contour for delineating Maglemosian hut floors. Simply, given the nature of the distributional trends of flint artifacts on and around the preserved floors, it remains a demonstrated fact that this contour is the best approximation to the wall lines! Also, contrary to what Stapert believes, the presence of a hearth does not in itself demonstrate the presence of a hut floor. Instead, it is contextual and corrobative evidence given other, primary, indications. In fact, several locations also show indications of outside open-air hearths. Stapert's notion of messiness of hearth areas, as an indication for their open-air location, once again only reveals his prejudices against past and present human behaviour.

On to Barmose I. Stapert writes: "There is no indication at all of any `wall effects'".

In fact there is (Johansson, 1971; 1990; Blankholm, 1991). The case is that Stapert's method is incapable of revealing them. Stapert's method is so 'hearth-andcircle-fixed' that it seems unable to detect structures or dwellings of other shapes (particularly if hearths are off-set from the dwelling's centre), for example Maglemosian hut floors that generally are rectangular or subrectangular in shape, measuring 5-9 m in length and 3-5 m in width and often with the hearth off-set towards one end.

Stapert (1992: fig. 3) provided a density map of flint waste. Apart from a few reflections, however, he made no scientific analysis. Clearly, a density map based on Cziesla's (1990) principles, with a set of contour lines at 275 piece intervals, is inadequate for the context. Simply, it is not scaled to reveal inflections (wall lines) or boundary effects. I strongly recommend the reader to see the sharp inflection in the distribution of debitage (Blankholm, 1991: fig. 100). In my view, this very clearly shows the boundary effect of the wall line. Irrespective of whichever method is used, the study of such phenomena also requires the detailed study of distributional trends across the site and the careful investigation of sections and artificial profiles. Moreover, the investigation of average weight per piece of flint per unit (Johansson, 1990) may be useful. All this also is contextual information, but again ignored by Stapert.

I need an exact coordinate (a set of numbers) for the origin of the ring and sector system in Stapert's investigation; not a position on a greatly reduced and off-scaled map, which need recalculation. As to his comment: "I can assure him that shifting it a few decimetres would not alter the results in any significant way".

I need no assurance or assertions from someone, who, for instance, investigates sites without consulting the excavator'spublications and then unfoundedlyproceeds to critisize other peoples methodologies on the basis of the outcome! In fact, we are not discussing a few decimetres, but a distance in the range of c. 0.5 m. If, for example, the centre is moved to a more appropriate coordinate, for instance 5,10.33, a brief inspection of the distribution plans for scrapers and microliths (Blankholm, 1991: figs 89 and 91) and using 0.33 m intervals would seem to indicate trimodal and bimodal distributions, respectively.

Stapert's ring and sector approach and notion of 'distance classes' still runs counter to basic statistics (Blankholm, this volume). Even if he abandons significance tests, for which areamust be accounted for in the calculation of the expected values, counts are still obtained from increasingly larger (sampling) areas. At least counts must be weighted relative to the sizes of the (sampling) areas.

Stapert's notion of 'expressiveness' reveals a limited scope of our discipline. If we wish to contribute to archaeology, or more modestly to activity area research, we certainly need to be realistic, begin to understand that prehistoric behaviour is multivariate in nature, penetrate deeper into the variability, and consequently apply multivariate approaches to its resolution. Contrarywise, mucheffortmay be wasted in developing simplistic and highly constrained spatial analytical methods and models, like the ring and sector method, that basically seem more aimed at confirming the obvious or trivial.

I also wonder how Stapert can argue: "... they do not give answers to specific questions at all ...".

There is a large body of good examples in the literature where multivariate methods have been used successfully to answer both specific and general questions, in all modesty including my own analyses of the Mask Site (Binford, 1978) and Barmose I (Blankholm, 1991 with references).

In archaeological examples one should first ask questions appropriate and relevant for the given cultural, behavioural and site specific context, then select methodologies accordingly (there is no single the method or panacea approach to spatial analysis (Blankholm, 1991)), and then proceed to apply those methods based on solid knowledge of the data. Stapert failed to do so with Barmose I.

REFERENCES

- BINFORD, L.R., 1978, Dimensional analysis of behavior and site structure: Learning from an Eskimo hunting stand. *American Antiquity* 43, pp. 330-361.
- BLANKHOLM, H.P., 1981. Aspects of the Maglemose settlement in Denmark. Veröffentlichungen des Museums für Ur- und Frühgeschichte Potsdam 14/15 (= B. Gramsch (ed.), Mesolitikum in Europa; 12tes Internationales Symposium, Potsdam 3 bis 8 April 1978), pp. 410-414.
- BLANKHOLM, H.P., 1984. Maglemosekulturens Hyttegrundrids. En undersøgelse af bebyggelse og adfærdsmønstre i tidlig Mesolitisk tid. Årbøger for Nordisk Oldkyndighed og Historie, pp. 61-77.
- BLANKHOLM, H.P., 1987. Maglemosian hutfloors: an analysis of the dwelling unit, social unit and intra-site behavioural patterns in early Mesolithic southern Scandinavia. In: P. Rowley-Conwy, M. Zvelebil & H.P. Blankholm (eds), *Mesolithic Northwest Europe: Recent trends*, Sheffield. pp. 109-120.
- BLANKHOLM, H.P., 1991. Intrasite spatial analysis in theory and practice. Århus.
- BOSINSKI, G., 1979. Die Ausgrabungen in Gönnersdorf 1968-1976 und die Siedlungsbefunde der Grabung 1968 (=Gönnersdorf Band 3). Wiesbaden.
- CZEISLA, E., 1990. Siedlungsdynamik auf steinzeitlichen Fundplätzen; methodische Aspekte zur Analyse latenter Strukturen (= Studies in Modern Archaeology 2). Bonn.
- JOHANSSON, A.D., 1971. Barmose-gruppen. Præboreale bopladsfund med skiveøkser i Sydsjælland. Historisk samfund for Præstø Amt 1968, pp. ???.
- JOHANSSON, A.D., 1990. Barmosegruppen. Præboreale bopladsfund i Sydsjælland. Århus.
- STAPERT, D., 1992 Rings and sectors: Intrasite spatial analysis of Stone Age sites. Groningen.