

ATTEMPTS WITH THERMOLUMINESCENCE DATING OF BRONZE AGE CENTRA

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The province of Södermanland, which lies south of lake Mälaren in eastern central Sweden, (fig. 1) preserves many monuments from the bronze age, the greater number of which are still visible in concentrations along the shoreline of that period.

There are graves consisting of cairns (fig. 2) or stone-settings, (fig. 3) the latter being slight features with intermixed humus and stones. Both types of grave are usually built of fairly large stones. Bronze age settlement sites are often identifiable through heaps of fire-cracked stones, frequently associated with ground surfaces which have been cleared of stones and with terraces (fig. 4). The heaps of fire-cracked stones appear as turf-covered mounds (fig. 5).

Analysis of the settlement sites shows that there are some which differ from the rest. Certain criteria to which these largely conform (e.g. the quantity, diameter and height of the heaps of fire-cracked stones, the topographical situation, the presence of a cairn of at least 20 m diameter associated with the site) indicate that these particular sites have a certain intrinsic similarity. They also seem to lie a standard distance apart and are so different from the other settlements (here called 'normal settlements') that we may, hypothetically, call them 'central places'. By tracing the natural boundaries around them (ridges, watercourses, large areas of woodland) we can postulate that each 'central place' had been surrounded by an area of between 920 and 980 km².

The arrangement postulated above suggests that the land had been claimed as early as the bronze age. This presupposes an overall and wellorganized social structure and we must wonder how this can have been brought into being.

In recent years anthropological concepts have been increasingly adopted by archaeologists as, for example, Elman R. Service's developmental theory of so-called 'primitive' society which is gaining favour (Service 1962, 1971). Service's four basic types — band, tribe, chiefdom and state — reflect the social organization of communities and the divisions are to some extent based on how far there is integration between the different groups. 'Band' and 'state' can be disregarded in this article as 'band' is generally associated with the stone age and 'state' with a more modern society whose functions include a market economy.

Basically, 'chiefdom' differs from 'tribe' by its having a denser population and a more cohesive society. Central places are important here as focuses for the co-ordination of economic, social and religious activities and the other significant characteristics of a chiefdom are a stratified society, surplus production and redistribution (compare Jensen, 1979; Kristiansen, 1981; Welinder 1977).

Service's criteria are largely applicable to this area of Södermanland. The central

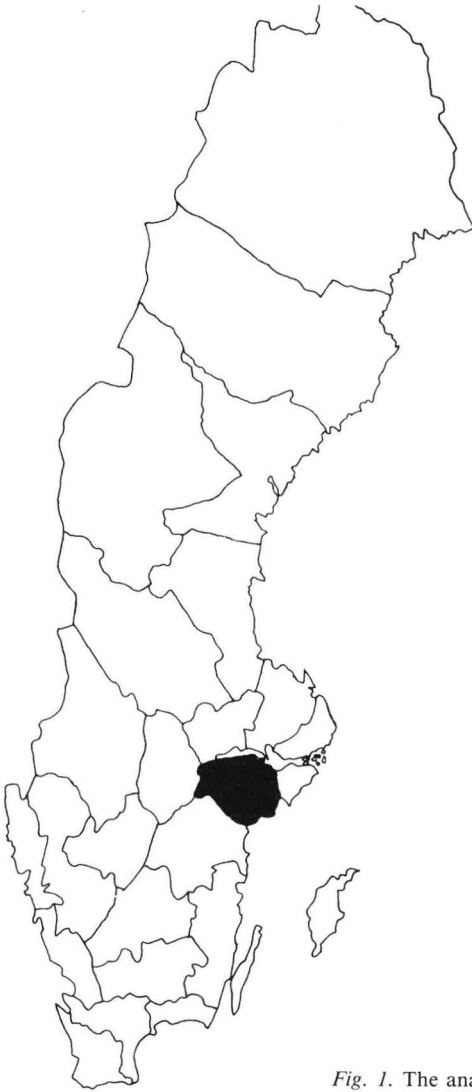


Fig. 1. The analysed area in Södermanland.

places which we have identified may have formed the focal points through which the surrounding areas with their normal settlements were controlled. The associated large cairns represent the religious aspect (compare Levy, 1982; Renfrew, 1983), and the normal settlements may illustrate surplus production, certainly some must have been specialized in some form. This last point may explain why some settlements seem to be isolated from the central areas of population and why some have no occupation remains other than heaps of fire-cracked stones and isolated hearths. We must always remember, though, that transitional forms and variations, including local traditions, always occur and so Service's developmental stages must be regarded as generalized types which have to be supplemented by relevant criteria.

The Risø laboratory in Roskilde has helped in the thermoluminescent dating of fire-cracked stones from the heaps within the central places (Mejdahl, 1982, 1983; Wagner—Aitken—Mejdahl, 1983). The questions posed were,



Fig. 2. Cairn in Gåsinge-Dillnäs parish, Södermanland. Photograph B. Eriksson.



Fig. 3. Stone-setting of bronze age character. Photograph B. Eriksson.

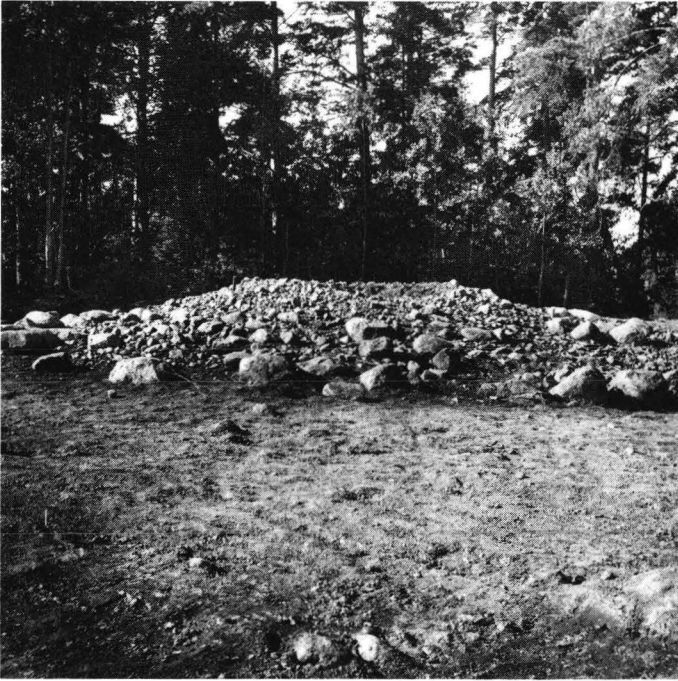


Fig. 4. Heap of fire-cracked stones, turf removed. Photograph S. Wigren.



Fig. 5. Turf-covered heap of fire-cracked stones in Halla parish, Södermanland. Photograph B. Eriksson.



Fig. 6. View with the central place in the background, Trosa-Vagnhärads parish. Photograph S. Wigren.

1. When in the bronze age did the central places exist?
2. How long were the sites in use?
3. Were they occupied at the same time or did they replace each other?

As three of the six central places have been dated the first two questions can be answered fairly easily. In order to answer the third question, i.e. whether the central places were contemporary, two adjacent settlements in the south of the province were dated and contrasted with a site in the north. The results of these datings have only recently been obtained.

One of the southerly central places lies in Trosa-Vagnhärads parish (fig. 6). It consists of *c.* 14 heaps of fire-cracked stones which can be divided into a central area with nine to eleven features and an outer area with about three. Eight samples from the central area were analysed; these were from the central place itself. Two of them were discounted because they diverged too much and the average value for the remaining six was 910 B.C. $\pm 40 \pm 180$ years. The three samples from the outer area gave an average value of 1250 B.C. $\pm 130 \pm 200$ years. The average value for the whole area, i.e. for nine samples, fell at 1020 B.C. $\pm 75 \pm 180$ years.

The adjacent central place lies in Runtuna parish (fig. 7). Here there are between fifteen and nineteen heaps of fire-cracked stones from which six analysis were made. One sample was discounted because of its great divergence while the remaining five had an average value of 890 B.C. $\pm 50 \pm 200$ years.

The third site, in Barva parish (fig. 8) in the north of the province, contained at least eleven heaps of fire-cracked stones and nine samples were taken from four of them. One of the results was discounted because of its great discrepancy and the average value for the remaining eight was 1170 B.C. $\pm 80 \pm 200$ years.



Fig. 7. The central place in Runtuna parish. Photograph B. Eriksson.

The analysis of samples from the three central places provides the answer to the first question, i.e. the period of their existence. The samples were taken from the upper layers of fire-cracked stones and with as wide a distribution as possible within each site. Both of the southerly settlements seem to belong to the 10th—9th centuries B.C., but that in Barva is about 200 years earlier. It must be remembered, though, that the margin of uncertainty is *c.* 200 years and that only a few heaps of fire-cracked stones within each settlement have been dated. The dates from Barva are most comparable with those from the outer area of Trosa-Vagnhärad. It is interesting to note that the features in Barva and in the outer area of Trosa-Vagnhärad are on average smaller in diameter and height than those in the central areas of Trosa-Vagnhärad and Runtuna. The smaller features which also occur in Runtuna may also be of an early date.

It is more difficult to answer the second question. The values from the central area of Trosa-Vagnhärad are spread over 310 years, from 3030 to 2720 in TL age, i.e. years bp. The comparable value at Runtuna is 274 years, from 3013 to 2739, and at Barva 681 years, from 3398 to 2717. It must again be remembered that these values come from samples from the upper layer, and C^{14} sometimes suggests that heaps of fire-cracked stones may have undergone a long period of construction. The central places may, therefore, have been founded during the earliest bronze age.

The answer to the third question, possible contemporaneity of central places, can be arrived at through the marginal time difference between Trosa-Vagnhärad and Runtuna: 20 years according to average values and with a standard deviation of 40—50 years. It is hardly likely that the settlements replaced each other or were moved and it is very probable that they were contemporary. The result from Barva suggests, however, that this central place is older.

Translated by Helen Clarke, Ph.D.

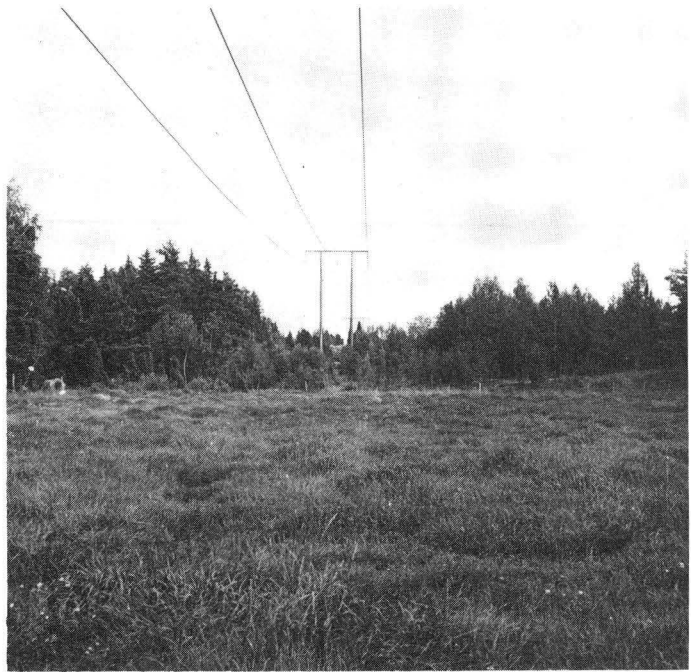


Fig. 8. The central place in Barva parish and two large cairns lie on the ridge in the background. Photograph B. Eriksson.

REFERENCES

- Jensen, J., 1979. Oldtidens samfund. Tiden indtil år 800. Dansk social historie 1. Köpenhamn.
- Kristiansen, K., 1981. Economic models for Bronze Age Scandinavia — towards an integrated approach. B.A.R.-S96 »Economic Archaeology» Eds. Scheridan, A. — Bailey, G. Oxford.
- Levy, J.E., 1982. Social and Religious Organization in Bronze Age Denmark. An Analysis of Ritual Hoard Finds. B.A.R. International Series 124. Oxford.
- Mejdahl, V., 1982. Second Nordic Conference on the Application of scientific Methods in Archaeology. Helsingör, Denmark, 17—19 August 1981. PACT 7.
- Mejdahl, V., 1983. Nordisk Laboratorium for Termoluminescens-datering (Vejledning for brugere).
- Renfrew, C., 1983. The Social Archaeology of Megalithic Monuments. In »Scientific American», November 1983. Volume 249 Number 5. New York.
- Service, E.R., 1962, 1971. Primitive Social Organization. Studies in Anthropology. Random House New York.
- Wagner, G.A., Aitken, M.J. and Mejdahl, V., 1983. Handbooks for Archaeologists No 1. Thermoluminescens Dating. European Science Foundation. Strasbourg.
- Welinder, S., 1977. Ekonomiska processer i förhistorisk expansion. Acta Archaeologica Lundensia Series in 8° Minore, N°7 Lund.