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DATING IN ARCHAEOLOGY

Abstract

This paper gives a short overview of the results of physical dating in Finland, and discusses the value of the "chronological artefacts" so obtained, in the general context of archaeological finds.

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A physical dating can be taken as a chronological artefact. Every artefact reflects some valuable information. In the simplest form a dating is the result of a physical measurement which gives the age of an event as a number of years. It may be good to remember that there exists, however, no machine which can produce these numbers. The chain from an event of interest in the past through field work and sampling into laboratory investigations, and to a final result for the age, contains many decisive steps. And these steps of decision influence the final result. For example, a decision has to be made when the age of a sample is related to the event of interest. Field observations play an important role in this case. But also in the laboratory there are many stages where decisions are made, and more important, stages where information about the sample can be picked up that is, information which is not directly reflected in the number giving the age. The use of the final result from a dating therefore requests great care, and when maximum information is wanted from the chronological artefact, good co-operation between the scientists involved in the different stages of the investigations is required.

The distribution of the ages of archaeological samples dated in the Dating Laboratory at the University of Helsinki during the period 1968–1990 is given in Fig. 1. In a way the distribution reflects the activity in the archaeological research of different periods. There is a broad maximum for Stone Age dates, very few dates for the Bronze Age (2500–3300 BP), a strong maximum in the distribution around 2000 BP for Iron Age samples, and also a maximum for samples dating to the last millennium.

Using the radiocarbon method for dating samples from the past millennium means a strong request for precision and high time resolution. At the same time it also provides a good opportunity to test the reliability of the method in cases where comparison to historical data is possible. An important basis for the use of radiocarbon dating on young samples are the high-precision calibration data presented by Stuiver and Pearson (1993). These data in combination with computer programs now available (Van der Plicht 1993; Stuiver & Reimer 1993) yield an efficient tool for conversion of radiocarbon dates into sideral years. At the same time the complex probability distributions arrived at in the calibration process introduce new difficulties in the interpretation of radiocarbon results.

One problem in radiocarbon dating is the internal age of the sample, as for instance charcoal from old fire-wood. In a dating program set up to date Saami dwelling sites known to be only a few hundred years old, we therefore decided to use reindeer bones because this material has a short life-span. Comparing the dates for the bones with the results from dating of timber and charcoal (Carpelan & Kankainen 1990) show that the own

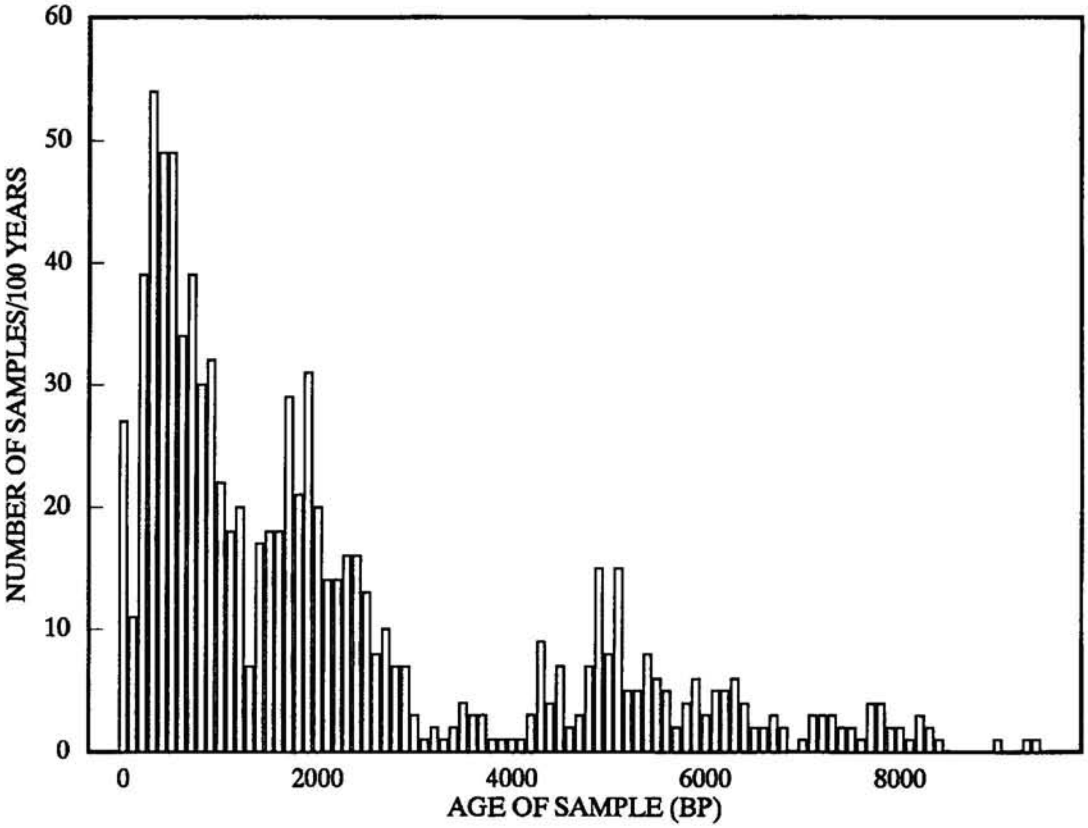

Fig. 1. The distribution of the ages of archaeological samples dated in the Dating Laboratory at the University of Helsinki during the period 1968–1990.

age of the timber and charcoal in this case usually ranges between 200–400 years (Carpelan et al. 1994). The bone dates are also supported by TL dates from burnt stones at the sites.

Almost all of the radiocarbon dates included in Fig. 1 prior to the Iron Age are based on charcoal samples. The influence of the own age of the samples on the dating result is difficult to estimate. It certainly varies from one locality to another. But this source of error must be remembered when striving for better time resolution. In this respect the AMS technique brings about important improvements because even small amounts of carbon containing materials other than charcoal can be utilized for dating.

References

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