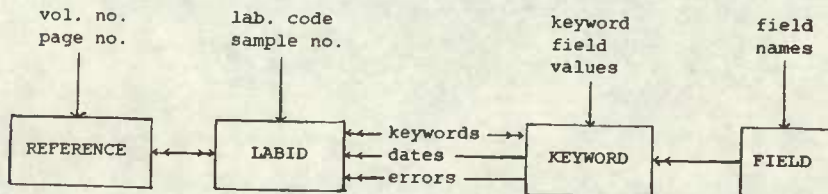RADIOCARBON DATABASES - A PROGRESS REPORT

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Abstract

A database of Old World radiocarbon age determinations directly relating to archaeological sites of Palaeolithic and Mesolithic age ( >50,000 - ~7000BP) has been set up at the Institute of Archaeology, University of London. The datafile is updated annually and is currently correct to the end of 1983. It is intended to function primarily as a research tool. Copies of this datafile as printout can, therefore, be purchased from the Institute of Archaeology for a small charge. The only caveat the compiler would enter is that she is informed of any alterations or additions made to the datafile by other researchers. The need for such indices to reduce duplication of research time spent in primary data acquisition has long been implicitly recognised. Many such datafiles may already exist. We would be pleased to hear from other compilers.

The datafile is managed using a commercial database management package, M.D.B.S., but could no doubt be adapted to Dbase II or other systems if necessary. Radiocarbon age determinations are particularly suited to database management analysis since the fundamental information can be easily broken down into a number of keywords and selectively retrieved to answer different research problems. In this system each radiocarbon age determination is treated as a single RECORD which is divided into fourteen FIELDS which list the salient features of each measurement and function as a keyword index referring the user back to the full publication reference, usually in Radiocarbon. The FIELDS comprise: site name; archaeological layer; cultural attribution; quality of association of the sample to the culture dated; sample type; quality of the sample as a dating medium; age; standard deviation; stable isotope ratio; laboratory identifier; laboratory sample number; publication reference; source, volume, page(s). Where information is not given in the original publication the field is left blank. One of the most useful aspects of this database is that an attempt has been made to assess the reliability of each age determination based on the quality of the sample and its archaeological associations. Thus it is possible to list all the determinations on a given cultural period but only check the Radiocarbon reference for reliable 'dates'. This could reduce considerably the number of 'bad dates' found in the archaeological literature.

The database management system was described in full in Moffett & Webb (1983). However, some modifications have been made in the past two years. The database is now managed as shown in the flow chart below:



vol. no.     lab. code      keyword       field
page no.     sample no.     field         names
                           values

REFERENCE ←→ LABID ←— keywords —→ KEYWORD ←— FIELD
                    ←— dates ——
                    ←—errors ——

The key to the system is the LABID which comprises the laboratory identifier and laboratory sample number, since this is the only information unique to each RECORD. The LABID is linked to the publication reference by an n:m relationship. The FIELD merely lists the names of the first nine fields in a RECORD, as explained above. It is linked to KEYWORD by a 1:n relationship. KEYWORD lists the values for each of the first nine FIELDS for any given RECORD. KEYWORD is linked to LABID in 1:n relationships through the sample age and standard deviation and in an n:m relationship through all the KEYWORD values. Thus it is possible to retrieve the complete RECORD for any given laboratory identifier, sample type, cultural phase, geographical area, or within a stated age range.

The database can also be linked to a graph plotter for the automatic generation of illustrations. Age ranges can be plotted against a linear timescale as a centre point plus an error bar of one or two standard deviations.

It is possible to use the datafile to provide information on many aspects of Old World Stone Age culture process. For example it is possible to list the RECORDS for all dates from two consecutive cultural periods and also plot out their chronological configuration. This would make the analysis of the degree of overlap or lack of it easier to assess. It is possible to analyse the reliablity of sample types. Sites of the same cultural attribution could be grouped by sample type. A graphical display comparing these sample groupings to each other would make assessment of their reliability easier. These aspects of the research potential of this database are discussed in greater detail in Moffett, Orton & Webb (in press).

Orton (1983) has recently published an iterative searching program designed to analyse a number of radiocarbon age determinations within which different archaeological phases should be detectable to examine the precision with which opening and closing dates for each phase can be determined from the radiocarbon information alone. The applicability of this technique to Palaeolithic cultural phases is discussed in detail by Moffett, Orton & Webb (forthcoming). At present this program is hosted on the IBM 3081 at the University of Cambridge. However, it is hoped to adapt it and integrate it with the datafile and graphics programs already developed by Jonathan Moffett to provide a single radiocarbon manipulation package available, for a small charge, to institutions with suitable host equipment.

References

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