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The Bonestack: a stack for old bones

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34.1 Introduction

This paper is a brief description of the Bonestack, which is a database management system being developed for recording data about bone from archaeological sites. Text-based screen data input systems such as Bonerec (Levitan, cited by Jones 1992) and FRUD, the Faunal Remains Unit Database (Winder 1994), have been used to record bone by some zooarchaeologists for several years. The Bonestack is different in that there is a graphical user interface (GUI) to the data entry system.

Data recorded about bone from archaeological sites is particularly well suited to a graphical user interface. Drawings of bones can be used on the screen, and the user allowed to 'point and click' with the mouse at part of the drawing to enter information about the location selected. The Bonestack was developed using the relational database management system Oracle running on Apple Macintosh, using features of HyperCard, and later Oracle Card, for the GUI, although such Oracle applications developed under HyperCard and Oracle Card may also be run on PC.

34.2 The Bonestack

The application is in two parts: the graphical user interface, and the underlying relational database. The database was built up of various tables which contained the fields necessary for recording information from bones.

The Bonestack user interface is best envisaged as if it was a pile of index cards. Many of these cards serve to provide data entry fields for a sub-set of information which needs to be recorded, thus functioning as a sort of data entry form. Thus, to aid data entry, one of these 'index cards' shows a line drawing of a skeleton, and other cards show line drawings of individual skeletal elements. Designated active points on the screen (buttons) were programmed to carry out specific functions when activated by a click from the mouse; many of these buttons were situated under parts of the line drawings.

Other cards serve as navigational tools, or prompts to assist the user. The ability to program navigational links between individual cards allows swift flipping between them in a number of ways for different purposes or in different circumstances.

The application was designed so that the computer sits on the bench where the bone is being sorted. The person recording the assemblage first sorts the bone into groups of species, within which are grouped in turn the different elements. They can thus move from, for example, a group of pig bones (perhaps several mandibles and some limb fragments) to a group of cow bones, recording all data from a fragment before moving on to recording data from the next fragment.

34.2.1 Data entry

The application guides the user through the complete data entry sequence: after launching Oracle, the user opens the Bonestack. The first card requires the user to enter information about the site, context and sample from which the bone came. Subsequent cards allow the selection of species. If, for example *Bos* (cow) is selected, a card containing a line drawing of a mammal skeleton is displayed (Figure 34.1). If a species of bird is chosen, a bird skeleton is displayed.

The skeletal element is selected by 'pointing and clicking' with the mouse at the relevant part of the skeleton on the screen, for example, at the scapula. In response to the selection, a new card is displayed showing a line drawing of a scapula marked with lines illustrating the subdivisions referred to as zones (Figure 34.2). Information is entered into fields using buttons or dialogue boxes wherever possible, thus whether the fragment is from the left or right hand side is recorded in response to a dialogue box where the appropriate side can be selected using the mouse. Fusion of the epiphyses (the proximal and distal ends of the bones) is recorded in a similar way. The size of the individual fragment is recorded by whether greater than 50% or less than 50% of each of the zones represented is present, selecting each zone on the screen. This data is then saved to the underlying data table.
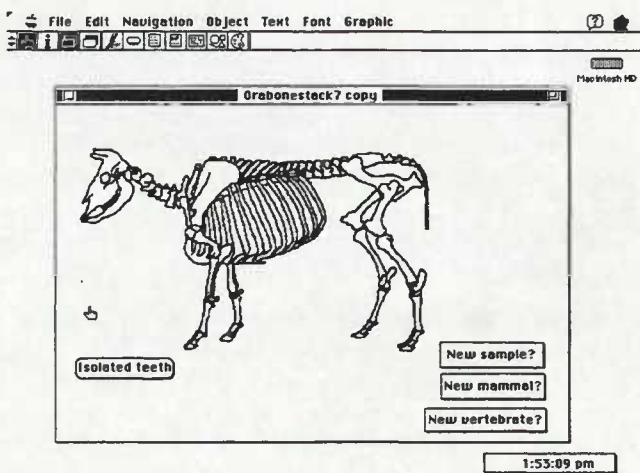
Figure 34.1: Card showing the mammal skeleton from which the individual element to be recorded in detail is selected.
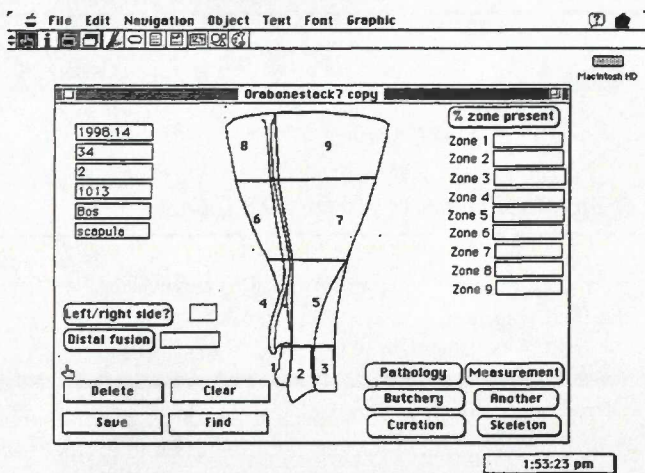
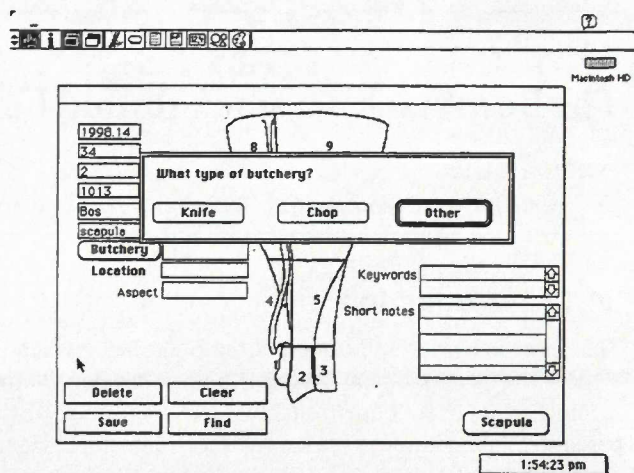**Figure 34.2:** The card for recording general information about the scapula.

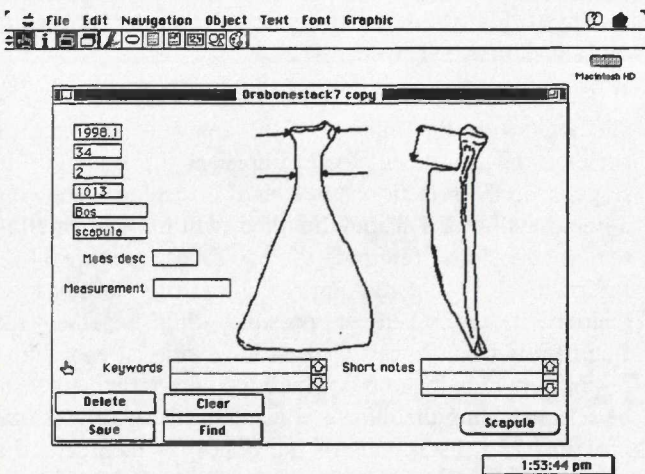**Figure 34.4:** The card for recording butchery on the scapula.

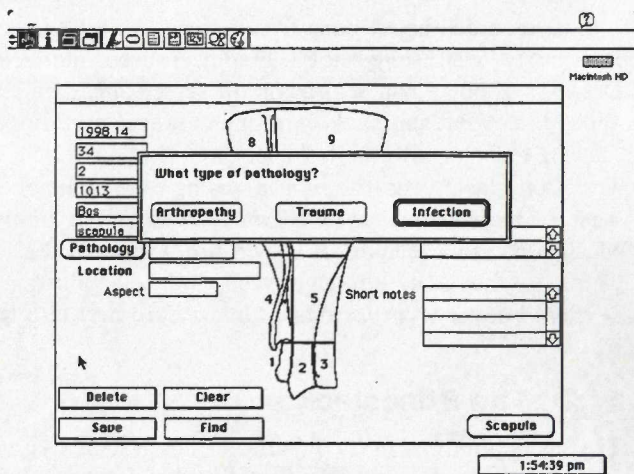**Figure 34.3:** The card for recording measurements on the scapula.

Figure 34.5: The card for recording pathology on the scapula.

Measurements of individual bones may need to be recorded, to allow comparison of the sizes of sub-groups of skeletal elements. Selecting the 'Measurement' button takes the user to a card showing, for example, a scapula, with the positions of the measurements commonly taken on scapulae marked (Figure 34.3). Selecting one of these locations enters the code for that measurement into the measurement description field, and the measurement itself can be typed into the measurement field. Further measurements may be taken before the user returns to the first scapula card.

Selecting the 'Butchery' button takes the user to a screen showing the element and its zones. Selecting the button "Butchery type" activates a dialogue box through which three of the commonest types of butchery may be recorded (Figure 34.4). Selecting the zones where the evidence of butchery has been observed enters the location of the butchery evidence in the appropriate field. Selection of the 'Pathology' button allows details of

pathology to be recorded in a very similar way to that of the butchery (Figure 34.5).

34.2.2 Data output

The data input to the database in this way can be interrogated and manipulated through SQL and by passing sub-sets of the data to applications such as a spreadsheet.

34.3 Summing up

This brief description of the Bonestack has served to illustrate a part of the system. However, from it it is evident that most of the data is recorded by pointing and clicking rather than by typing, although fields are available where required for fuller comments. The Bonestack has been used to record assemblages of bone in the EAU for three months at the time of writing, and it seems that the graphical user interface allows the user to work quickly by obviating the need for a lot of typing, and also by helping to guide the user through the recording

process in a methodical way. The material from different sites is thus recorded in such a way as to be comparable.

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References

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