

Report on Sand teeth

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INTRODUCTION

Two human teeth were found during the excavations at the Mesolithic midden of Sand. However, direct dating of one of the teeth, a permanent central incisor, indicates that it is not associated with the midden, and dates instead to the Early Bronze Age (2115-1690 cal BC). The date of the other tooth, a deciduous molar, is unknown. As the root is missing, no dating is possible for this specimen.

PERMANENT MAXILLARY CENTRAL INCISOR

This is a large permanent, maxillary central incisor (Figure 1). The occlusal surface is moderately worn, with a line of dentine exposed (wear stage 3-4, using Smith 1984). Chipping on one edge appears to have occurred during life, as there is evidence of smoothing. As the incisors are rarely involved in heavy mastication, the chipping may reflect the use of the teeth for non-deitary purposes (e.g, use of the mouth as a 'third hand' during manufacturing or other activities). No enamel hypoplasia is indicated.

Examination with a light microscope at low/medium magnification (30-100x) shows a series of striations on the labial surface. These certainly occurred in life rather than post-depositionally (there is almost a complete absence of similar striations on the lingual surface) and could relate either to dietary or non-dietary use of the anterior dentition, or, most probably, to some combination of the two. Incisors are rarely used for dental microwear studies, and so little in the way of comparative data are available. Ungar and Spencer (1999), however, have indicated that consistent patterns in incisor microwear can be used to differentiate Amerindian populations with different diets. Further work will have to be undertaken with a larger sample of British material before interpretation can be attempted. Even then, little can be said about one tooth in isolation.

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DECIDUOUS MANDIBULAR FIRST MOLAR

The second tooth found comprises a deciduous, right mandibular first molar (Figure 2). Only the crown is present, so that it is not possible to comment on the stage of root development. However, the state of wear on the occlusal surface strongly indicates that the tooth was fully erupted, and likely had been for some years prior to death. Indeed, it is possible that this represents a shed tooth. The cusps are nearly entirely worn down, with dentine exposure across much of the occlusal surface. The most likely age range represented by the tooth is 8-10 years.

Chipping on the lingual edge of the occlusal surface appears slightly worn, and so may have occurred during life, possibly indicating the consumption of quite hard foods from a relatively young age (though keeping in mind that the tooth is likely that of an older child). This is supported by the high degree of occlusal wear noted above. Chipping could also be caused by grit incorporated into foods through processing (e.g., grit from a grinding slab, incorporated into dried fish or meat, sand in shellfish, etc.). No caries or enamel hypoplasia are present. A slight amount of calculus is present on the lingual surface of the tooth, near the enamel-cementum junction (Figure 3).

DATING AND STABLE ISOTOPE DATA

The root of the permanent central incisor was sent for an AMS determination, returning a result of 3615 ± 65 BP (Lab no. **). The associated $\delta^{13}\text{C}$ value of -18.5‰ suggests some input of marine protein in the diet of this individual, on the order of approximately 20%. This necessitates a slight correction for the marine reservoir effect (Barrett *et al.* 2002a). Using Calib 4.4 (McCormac *et al.* 2002; Stuiver *et al.* 1998) and taking this into account, the date calibrates to 2115-1690 cal BC, most likely falling within the range 2040-1730 cal BC. This places it within the Early Bronze Age.

Unlike bone, the dentine that makes up the tooth root is a very stable structure, with a very low turnover rate. Thus, the dietary signal largely refers to the time during which the root was being formed, in this case ages 4-8. Nevertheless, it is likely that this more or less is also representative of the adult diet of this individual and their community, if only for the reason that it is difficult (though by no means impossible) to envisage a situation in which young children should eat more marine protein than adults in the same community. While a contribution on the order of 20% marine protein is far from insignificant, it is still a relatively minor proportion of the total protein intake.

In terms of broader comparisons, individuals dating to this period in Scotland are relatively rare. Of those that are known, the Sand tooth represents the highest $\delta^{13}\text{C}$ value yet found. And this seems to be the pattern for most of post-Mesolithic Scottish prehistory, with $\delta^{13}\text{C}$ values above about -19‰ being essentially non-existent between 5000 and 2000 BP. After 2000 BP, a number of coastal sites, mainly from Orkney, have individuals with more elevated values, between -19‰ and -16‰ (Schulting and Richards 2002, Fig. 5). This is especially so in the Viking period, when the use of marine foods in Orkney becomes very significant (Barrett *et al.* 2000). The possibility of regional variation in earlier periods still exists, however, and perhaps the Sand tooth is providing some indication of this.

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Figure Captions.

Figure 1. Sand permanent, maxillary central incisor, labial view.

Figure 2. Sand deciduous, mandibular right first molar, occlusal view (max. length = 7.9 mm).

Figure 3. Sand deciduous, mandibular right first molar, lingual view.