Can the analysis of human skeletal remains tell us about social relations and identity in the past?

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1. Introduction

Skeletal remains fascinate many people; perhaps this is explained by an interest in personal identity and genealogical past or, in some cases, because of nationalistic, political or ideological motivations (Renfrew and Bahn 208:545-548). Remains are initially analysed through taxonomic and osteological studies, which identify an individual's morphology, followed by anthropological and ethnographic centric interpretation which attempts to establish the individual's place within a social context.

In many excavations, such as at Seville plantation or Ötzi 'the Iceman', human remains are initially a collection of bones disconnected from the living person and their community. So how successful can the analysis of skeletal remains be when remains are incomplete, ambiguous and without historical record?

2. Ascribed and Attained Attributes

Analysis of remains has two primary activities; determining ascribed attributes over which individuals had no control, such as age, gender, stature, ancestry and pathology, and attributes attained during their lives, such as social relationships and stratification (Pearson 2005:74).

Osteologists, after unambiguously determining that a bone is human, attempt to determine whether bones are from one or more individuals and their physical attributes (White and Folkens 2005:359). For example, Armstrong and Fleischman (2003:38) were able to determine the ascribed attributes of four individuals buried between 1720s and the 1750s from the house-yard areas at the Seville plantation using "bioarchaeological investigation of the osteological remains". Their study identified pathologies such as chronic anaemia and osteomyelitis.

Investigation of Ötzi 'the Iceman' determined significant ascribed and important attained attributes about a prehistoric man who was killed ±5,300 years ago (Fleckinger 2007:31-33,37-41,46,50). Ötzi was approximately 45 years old and had blue eyes with dark-brown hair; he was missing his twelfth pair of ribs and had 50+ tattoos. He suffered from osteoarthritis, arteriosclerosis and whipworm-parasites. Fingernail Beau-Reil lines indicated periods of poor-nutrition and he had repeated incidents of frostbite. Ötzi died traumatically; with craniocerebral trauma and an arrow piercing his left shoulder-blade. After Ötzi's death his body and his possessions were left undisturbed.

Osteology reaches beyond the 'simple' identification of human attributes; for example identifying the visible cultural differences of peoples with different life-style (see Figure-1).

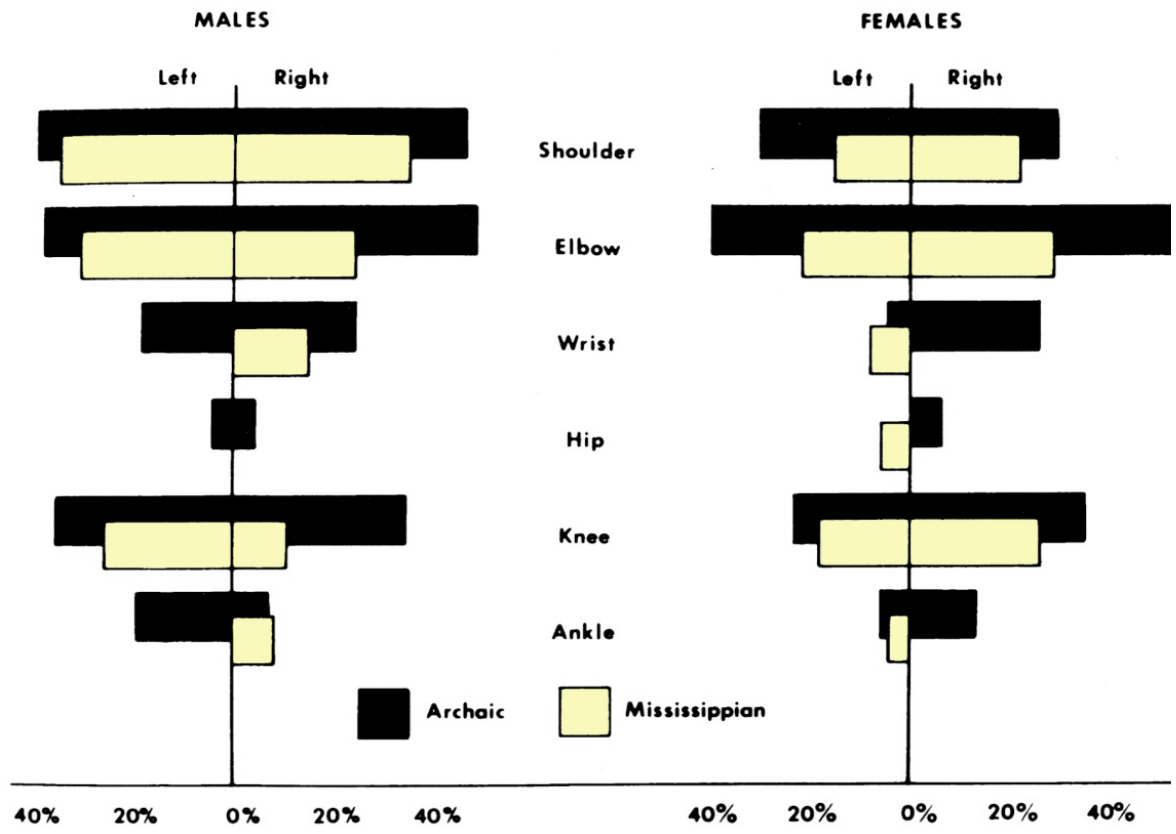

Figure-1: Cultural Differences in Osteoarthritis distribution in hunter-gather and agricultural populations (Roberts and Manchester 2010:149)

Mays (2009:23) stresses that communities have widely different cultural rules for 'managing' the dead; for example the location and orientation of burials, body preparation or grave goods/offerings. The dead tell us about their living kin-group and community and how, in an ideal world, they wanted to be perceived (Pearson 2005:3-5,12). Simple factors, such as grave depth, may reveal the occupant's kinship, social status or gender - or the living communities' respect of them or, as Pearson (2005:84) explains, "graves are … an index of social status". The four Seville burials were interred using western burial practices, in wooden coffins and clothing, but the grave-goods and placement within a domestic context indicates a continuity with African practices and beliefs (Armstrong and Fleischman 2003:39-40). The Seville burials demonstrate the segregation of slave burials which is also found in the Clift's plantation in Virginia (Mays 2009:193) and the African Burial Grounds in Manhattan (Pearson 2005:13-15) - which have similarities to current segregated burials/cemeteries for different religions.

Armstrong and Fleischman (2003:33-65) combined ascribed attributes, burial artefacts and mortuary practice to interpret the community's social relations and attempted to identify and name the living individuals. Scientific analysis would have provided additional information from the remains; for example DNA to reveal family relationships or birth place. Ötzi is an excellent example of the depth of information which is available through scientific research; isotope analysis indicated that he lived in the Southern Tyrol's Vinschgau or Eisack Valley. Hair analysis revealed high levels of arsenic that,

combined with Ötzi's copper axe, indicated that he was engaged in metal-working/smelting. Pollen originated from over 30 plant-types including the Hip Hornbeam which definitively placed his death to late-spring when it flowers (Bahn 2003:87-90). Pollen also established his contact with an agricultural community (Fleckinger 2007:33,94). Fleckinger (2007:99) combined Ötzi's ascribed attributes and possessions, representing attained attributes, to establish that he was a member of a warrior and leadership class with "considerable status" within his community.

Chemical analysis of skeletons at Clift's Plantation (Mays 2009:193) established that they had different lead concentrations; this simple method differentiated the owner's family (high-concentration through using pewter vessels) and the slaves (low-concentration). Pearson (2005:179), writing about the African Burial Grounds in Manhattan, used Mitochondrial DNA to establish that many of the people originated from West Africa or Madagascar. Both of these scientific techniques demonstrate that skeletal remains, even though they are separated from the living person and their community, have the ability to give identity to the remains.

Smith and Brickley (2009:113-114) analysed isotopic ratios of carbon and nitrogen in human collagen to identify individual's diet during the last decade of their life. For example Figure-2, with many samples having $\delta^{15}N$ above 9‰, suggests that individuals consumed high levels of animal proteins and this indicates a society utilizing animal husbandry. Roberts and Manchester (2010:223) add that a high-quality diet results in a stronger immune system and an increased resistance to diseases such as the chronic anaemia found at the Seville plantation (Armstrong and Fleischman 2003:61).

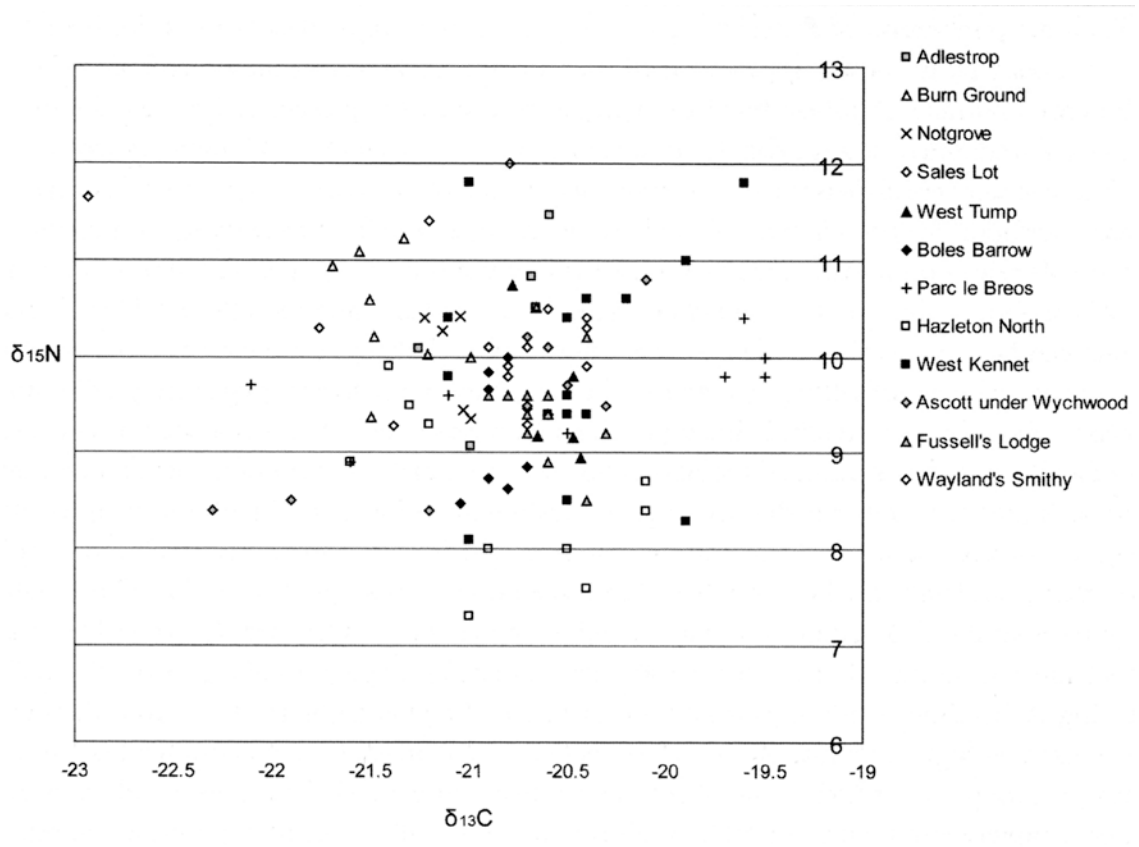

Figure-2: $\delta^{13}C$ and $\delta^{15}N$ stable isotope analysis at UK Neolithic sites (Smith and Brickley 2009:115)

Dental enamel permanently retains chemical ‘markers’ which can identify where a person spent their childhood. Oxygen isotope analysis and Strontium isotope analysis are complimentary methods. The geology of the local natural environment determines the levels of Strontium in enamel and Strontium isotopes analysis, typically, uses the ratio of ^{87}Sr and ^{86}Sr to determine locations where the geology has a matching ratio (Evans 2008) and Bowlder (2011) writes that this has helped trace the movement of early "hominin" species including *Australopithecus africanus* and *Paranthropus robustus*. Teeth are partially formed from oxygen which comes from the water we consume (Chenery 2008); two oxygen isotopes are measured to suggest where a person lived while their teeth formed. Data is available for many of the world’s regions and these methods may have identified the birth places of individuals buried at the Seville plantation and definitively confirm that they were African.

3. Conclusions

Skeletal remains are dislocated from the living individual. It is possible, through the careful analysis of ascribed and attained attributes, to establish, to some degree, information about the living person. It is usually impossible to establish the person's name but we can build a picture of their individuality. The value of analyzing skeletons, as well as burial contexts, has real value in helping us to understand the person's social relations and community.

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