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RESEARCH UPDATE

The Human Remains Collections at the UCL Institute of Archaeology: Recent Acquisitions from Eastgate Square, Chichester, Sussex

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In the summer of 2014, the UCL Institute of Archaeology (IoA) acquired a new collection of human remains from the cemetery site of Eastgate Square (Chichester, Sussex, England), which now forms part of the permanent osteological collection. This new acquisition complements the Human Osteology Teaching Collection and the Waldron Palaeopathology Collection, and provides core material for the MSc Bioarchaeological and Forensic Anthropology. This short report provides some background on the collection, and presents preliminary findings from current projects using the material.

The material now housed at the IoA represents a small portion of the human remains found during the extensive excavations undertaken by Archaeology South-East (ASE; the field unit for the Institute of Archaeology) at the site of Eastgate Square (ESC11), in the town of Chichester, West Sussex, which was excavated by ASE in the period August 2011 to January 2012, in advance of a project to redevelop the land (Hart et al 2012). The site, also known as 'The Litten' or 'St Michael's Litten' (apparently a local term denoting burial ground) (Morgan 1992), saw usage over a period of two millennia, with the earliest features (defensive ditches) dating to the Roman occupation of the site. However, the bulk of the human remains (and other archaeological material) uncovered at this cemetery site dates to the post-medieval period (1550–1850), with the suggested terminal date of 1859, although some burials probably occurred after this point (Hart et al 2012). For further information on the archaeology of the site, please refer to the preliminary report (Hart et al, 2012; ASE report 2012060).

During the course of excavation, 1634 burials were recovered (93 had been previously recorded in preliminary site investigations); 430 of these were classified, on site, as 'Category 1', indicating that the preservation of the remains was sufficiently good to warrant further investigation, so were retained by ASE. All other burials were re-interred after initial on-site osteological assessment (age/sex estimation; notation of any pathological conditions; burial position). However, in 2014 ASE could no longer retain these Category 1 skeletons and the decision was made to re-house them here at the IoA, so that they could be used in teaching and research, rather than to allow them to be reburied. These 400+ skeletons are now currently available to staff and students for research, although re-boxing and recording

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of the material is ongoing. While a full and detailed osteological analysis of the material is still very much in progress, some preliminary information is presented here, as well as some details of past and current research projects being undertaken by MSc and PhD students.

Of the 430 retained burials, approximately 75% of them were classified as 'Adult' (over 18 years) and 25% 'Sub-adult' (under 18); of the adult specimens, roughly 40% were determined to be 'Female' and 52% 'Male', with some specimens still requiring further analysis to establish sex. The majority of the material (66%) dates to the later periods of the cemetery usage – the 18th and 19th centuries; this was established through an examination of burial types. There were a number of different 'styles' of burial used throughout the cemetery's temporal span, but the most common found were: 1) those where the individual was interred directly into the soil, wrapped in a simple shroud; 2) where the individual was interred in a wooden coffin; and 3) where the individuals were interred in a wooden coffin within a brick-lined tomb. These different burial styles are likely to have been associated with both the 'burial fashion' at a given time, as well as the wealth of the individual interred.

This bias towards the later post-medieval period is not unexpected, as it is likely that older burials would have been more poorly preserved. However, an unexpectedly high proportion (75%) of the sub-adult burials in this collection date to the later phases of the cemetery, perhaps suggesting some sort of burial bias in the earlier phases (for example: during the Medieval period, the burial of an unbaptized infant – one that may have been born dead – in consecrated ground would not have been permitted, meaning that these very young children would have been interred elsewhere).

Perhaps the most remarkable thing to note is the high level of pathology (disease) observed in these remains. One of the reasons for this is that the excavators had, in fact, decided to retain specimens preferentially (regardless of overall bone quality) if notable or unusual pathology was observed. As most of the specimens are from the post-medieval period, a second reason may relate to research which suggests that this period was a time of increasing disease prevalence, due to numerous factors including increasing urbanisation (crowded conditions), poor sanitation, poor general living conditions, and poor nutrition (Roberts and Cox 2003). In **Table 1**, all of the pathological conditions noted thus far are listed. Most of these conditions one would expect to see in virtually any post-Medieval skeletal assemblage (like osteoarthritis, a chronic joint condition, or dental disease – both of which are extremely common throughout human history, and today), but there are a number of specimens whose conditions are rather rarer. The specimens which stand out in this regard are: 1) the elderly woman with the large calcified uterus (uterine tissue expanded through growth of tumours and hardened into a large mass of almost pure calcium) – the largest of its kind ever discovered archaeologically [For further information please refer to Cole et al (2015)]; 2) the elderly man with advanced prostate carcinoma (cancer is still rare to find archaeologically, despite its common occurrence throughout history); and 3) the child (approximately 1–1.5 years of age) suffering from Caffey's disease – a genetic condition which has been described only a handful of times throughout the archaeological record. These few specimens, while exceptional, still represent only the very beginning of the palaeopathological research on this collection and we hope to find many more interesting and noteworthy specimens during our continued examination of the material.

Despite having been acquired only two years ago, the material has already contributed to many projects, and forms the primary material upon which MSc Bioarchaeological and Forensic Anthropology students plan their dissertation work. To date, over 30 MSc projects have been completed using

Condition Group	Observed pathology
Joint Disease	*Osteoarthritis*: Inflammatory condition of the joints
	Rotator Cuff Disease: A condition affecting the bones in shoulder
	Gout: Build-up of uric acid which causes inflammation and pain
	Reactive Spondyloarthropathy: An inflammatory disease causing arthritis
Bone Forming and DISH	*Diffuse Idiopathic Skeletal Hyperostosis (DISH)*: Bony hardening of ligaments where they attach to the right side of the spine
	Hyperostosis Frontalis Interna (HFI): Thickening of bone along the inside surface of the front of the skull
Infectious Disease	*Osteomyelitis*: An infection of bone
	Tuberculosis: Infectious disease of the lungs
	Venereal Syphilis: Sexual transmitted infectious disease
Metabolic Disease	*Osteoporosis*: Loss of bone density, usually due to age
	Paget's Disease of Bone: Progressive thickening and weakening of bone
	Rickets: Vitamin D deficiency, causes weakening of bone and deformity
Neoplastic Disease	*Leiomyoma of the Uterus* (Cole et al 2015): Tumorous growth of the uterus
	Metastatic Prostatic Carcinoma: An advanced and aggressive form of prostate cancer
	Cysts: Benign growths
Congenital/Genetic	*Kyphoscoliosis*: A type of spinal deformity
	Congenital Syphilis: Life-threatening disease of childhood
	Cortical Infantile Hyperostosis (Caffey's Disease): Swollen bone in the limbs of young children
Trauma	*Long bone fractures*: Various breaks from traumatic injury
	Autopsy: An indication of post mortem dissection

Table 1: List of pathological conditions observed on the Eastgate Square (ESC11) material.

the Chichester collection (**Fig. 1**) and a number of PhD projects have utilised the material. Project topics include: evaluation of different methods for estimating age or sex; occurrence of spinal disease; diagnosis and distribution of rotator cuff disease (a condition affecting the bones of the shoulder); the relationship between social status and activity, as inferred from muscle markings across the skeleton (markings created when muscles are used in a repetitive fashion, due to particular behaviours; for example, those who work in very physical jobs often have more well developed muscle markings compared to those who are more sedentary); isotopic diet analysis; and prevalence of various pathological conditions (including osteoarthritis and dental disease). Two recent MSc projects are detailed briefly here:

1. *Mastoid Process Size and Sex Estimation*: In this project, the skulls of over 50 skeletons were analysed for the purpose of determining how useful metric assessment of the mastoid process (a cranial feature, just below and behind the ear-opening) is in the assessment of sex. In each skeleton sex was

Figure 1: A MSc Bioarchaeological and Forensic Anthropology student collecting metric data from the mandibular dentition of an individual from Chichester (Photo Carolyn Rando).

assessed independently by examining the pelvic outlet, and this result was then compared to 3 different measurements of the mastoid. This research suggests that in individuals with strong female or male characteristics, the mastoid measurements were highly dimorphic (showed a strong difference between male and females). However, in specimens where the sex characteristics were slightly more ambiguous, the measurements of the mastoid itself were not enough to determine sex independently. These findings indicate that while the mastoid does vary metrically between the sexes, it should be used only as part of a suite of metric and non-metric traits and not as a single criterion for determining sex.

2. *Osteoarthritis and Social Status*: This project examined the relationship between the pattern and prevalence of osteoarthritis (OA) (which can be used to interpret activity and behaviour) and social status (inferred from burial type). Fifty skeletons were examined for presence/absence of OA in all of the major joints of the body (shoulder, elbow, hip, knee, etc.); sex and age were also estimated using standard anthropological techniques. The pattern of OA was then compared between the different burial types (shroud or coffin vs tomb), and then stratified by sex. The results suggest that the pattern of OA did not vary between males of different social classes, while in the females there were clear differences in the patterns. This potentially indicates that males of both lower and upper classes were probably undertaking similar types of physical activity or behaving in similar ways – while females were not, with upper class women perhaps doing less physical work than their lower class counterparts.

Further publications on various aspects of the collection are forthcoming and it is expected that this collection will continue to contribute to student learning and research for many years.

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Competing Interests

The author declares that they have no competing interests.

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