

CoLAT Project Update: March 2016

The Impact of Industrialisation on London Health

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Last year, CoLAT announced that it would be funding an exciting new research project to be run over 3 years following a large bequest by the late Rosemary Green to the Trust. The Impact of Industrialisation on the Health of London Populations is a large scale interdisciplinary project that aims to bridge the gap between current medical and osteoarchaeological knowledge, exploring how the London environment has changed our health from past to present.

To help answer such questions the use of the latest digital technologies, digital radiography and CT scanning is currently being undertaken on the largest collection of archaeological human skeletal remains in the UK, curated by the Museum of London at the Centre for Human Bioarchaeology. These collections hold the key to observing shifts in health patterns over the past 1,000 years in London, and in particular looking at the effects of the Industrial period on our improved lifestyles and longevity today. Were diseases that are commonplace today, such as cancers as well as conditions linked to obesity and old age, equally as prevalent in the past? Only by examining the skeletal remains of the earlier inhabitants of London and comparing these to modern health statistics, as well as more rural non-metropolitan populations, can we fully appreciate the impact that living in London has had on human health.

Since the launch of the project in June 2015, digital radiographic analysis has been undertaken using a portable radiographic kit on over 530 adult individuals from six London sites and two non-metropolitan archaeological skeletal assemblages, totalling approximately 3400 skeletal elements. The radiographic survey involves taking radiographic images of selected elements within the skeleton that will provide the maximum amount of information while simultaneously allowing us to look at large numbers of skeletons. The radiographic images are immediately available on screen once the radiograph has been taken, which allows a review to be made of the radiographic image on site straight away, so that assessment can be made as to whether further images are required of more skeletal elements. The radiographs are taken following clinical protocols for the positioning of the elements and can be navigated using a standard medical imaging programme, as well as being converted to jpegs for ease of archive access. The radiographic archive will be a substantial resource at the end of the project and currently there are already over 3,500 radiographic images.



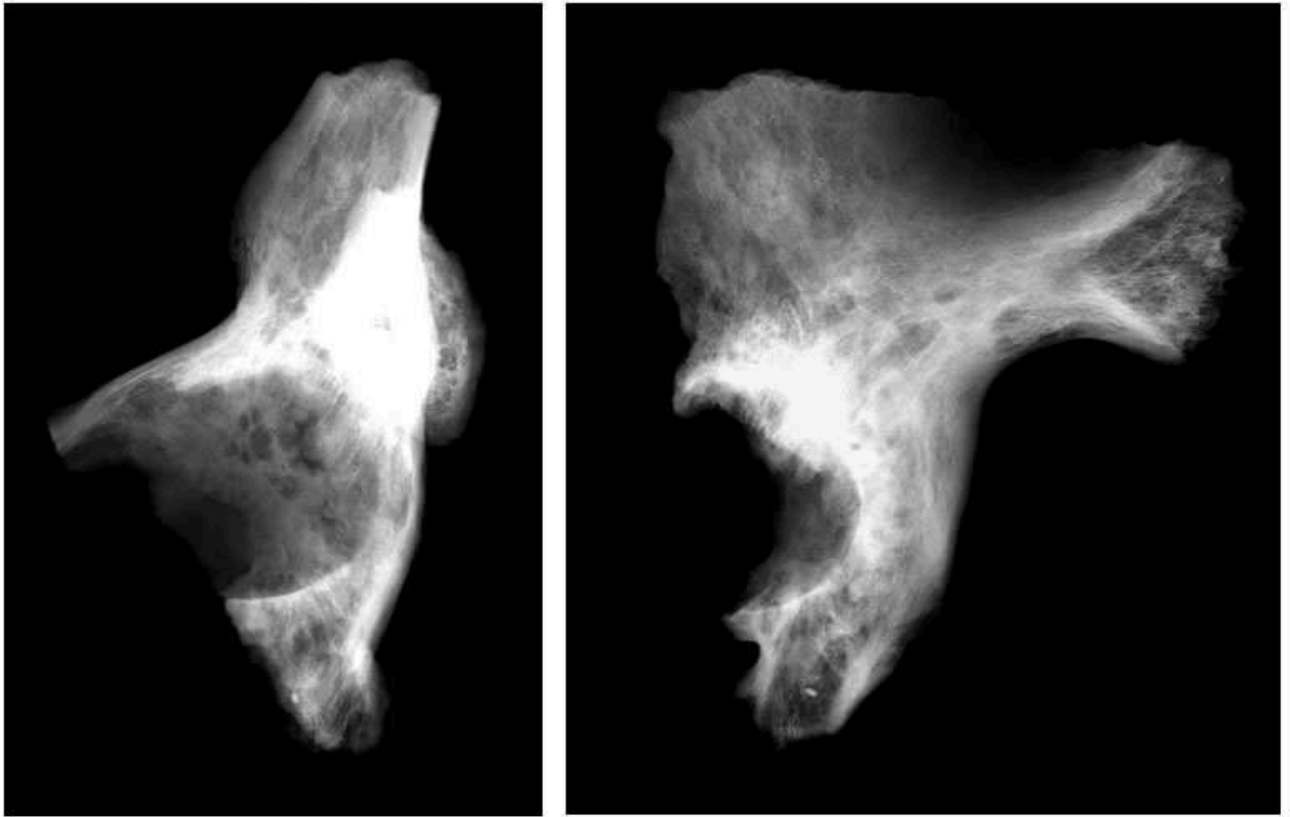
Skeletal Elements About to Undergo Radiographic Examination

When looking at the radiographs, we are looking for changes relating to bone density that may result from pathological conditions, though care must be taken not to confuse any observations with post-mortem damage, which invariably archaeological skeletons are subject to. Changes in bone density can be caused a wide variety of conditions. By targeting the crania, vertebrae, femora, pelvis and hand bones, we aim to be able to confirm the presence or absence of diseases that are known to be common place in modern populations, such as Hyperostosis Frontalis Interna (most commonly seen in old age females), cancers, osteoporosis and joint diseases. As well as more unusual age-related conditions, such as Paget's disease, an example of which we have confirmed by our radiographic examination in a female from the site of Holy Trinity (See image below). The cause of Paget's disease is still not fully understood; it predominantly affects older individuals and is common in the UK with a trend for particular regions. Radiographic identification is the best means to verify its presence in dry bone and with the project gaining

such data increases the potential to better understand the disease. This data will be added to osteological data already recorded for diseases macroscopically observed in the skeletal collections by osteologists, such as rib lesions (related to chest infections), pipe smoking grooves, trauma and Diffuse Idiopathic Skeletal Hyperostosis (related to older age and diets rich in animal proteins). Where radiographic images are inconclusive, CT scanning will be undertaken on a small number of elements to confirm initial observations. All of the digital images will be stored with access online to provide an interactive archive for future researchers and the general public to access.



Digital Radiographic Images Are Displayed Immediately For Examination



Radiographic changes in the pelvis: Lighter and Darker Areas In the Bone Indicate Changes In Density Often Seen in Paget's Disease

The skeletal assemblages examined so far include the post-medieval assemblages from London of Bow Baptist, Chelsea Old Church, St. Bride's Lower Churchyard, Billingsgate, Broadgate/Liverpool Street and Bethnal Green. This will provide a range of data from well preserved skeletal remains from individuals across a spectrum of social classes and different locations in the environs of London. The date ranges for the London post medieval sites are contemporaneous and offer a good range of varying environments for comparison. The majority of the remains are of people living in London at the height of the Industrial period during its ongoing metropolitan development and may give us some insight into the earliest consequences of its impact on health, particularly in relation to age, occupation and environmental changes. Of added research interest, some of the individuals have associated biographical information (such as age, sex, date of death) from coffin plates, enabling other documentary sources to be investigated. Of further benefit, for a number of them cause of death from burial registers is recorded and death certificates are available post 1837, which we will be able to examine in relation to the radiographic evidence.

In addition, we have also completed radiography of the human skeletal remains recently excavated (and now reburied) from the Holy Trinity Church, Stratford-upon-Avon. This is a small town located in rural Warwickshire where there was little change in the size of the population or the overall structure of the town from the medieval to the post-medieval periods, in part due to the lack of heavy industries based there. The town is a riverine settlement with an economy largely dependent upon local agriculture and the sheep trade. We have also analysed remains from a small assemblage at Upton-on-Severn (Worcestershire), which is similarly rural with employment of mostly males in agriculture.

	YMA	MMA	OMA	YFA	MFA	OFA	Total
London Post-Medieval							
BBP07 - Bow Baptist	0	3	4	6	4	4	21
PAY05 - Bow Baptist	18	18	13	27	19	11	106
OCU00 - Chelsea Old Church	2	4	14	5	3	7	35
FAO90 - St Bride's Lower Churchyard	10	25	38	15	17	35	140
BIG82 - Billingsgate	7	9	4	4	5	0	29
LSS85 - Broadgate/Liverpool Street	12	15	2	15	10	7	61
PGV10 – Bethnal Green (on-going)	8	9	14	4	5	10	50
Total							442
Non-Metropolitan							
P4442 Holy Trinity	8	13	13	13	8	8	63
WSM43246 Upton-on-Severn	4	4	1	1	0	0	10
P4442 Holy Trinity - Medieval	4	4	1	3	3	4	19
Total							92

Dissemination about the project is ongoing with a number of forthcoming talks and presentations, including the LAMAS annual conference and the Paleopathology Association annual meeting in the USA. Participating in such events is an invaluable way of engaging with a broad audience and sharing details about project.

Very shortly, we will be heading to Durham University for a week of radiography, where we have been granted permission to access the skeletal archives of two further non-metropolitan burial sites dating to the post-medieval period, namely Fewston (Yorkshire) and Coach Lane, North Shields. We hope to analyse and radiograph over 100 more adult individuals from these two sites that are very different environments, the former a rural setting and the latter in the melee of a rapidly expanding trading port that had a huge effect on the physical and social landscape.

In the second year of the project, we will be continuing our radiographic analysis of the remaining selected London sites and two large non-metropolitan sites from North Yorkshire and North Lincolnshire, continuing the significant progress made so far.