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Members of the Appleby Archaeology Group were introduced to the subject of bioarchaeology when Professor Charlotte Roberts from Durham University spoke on *What we can learn about the human remains of our ancestors: the study of bioarchaeology.* Professor Roberts, who trained as a nurse before studying archaeology, is one of the United Kingdom's leading experts in osteoarchaeology and paleopathology

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Bioarchaeology is the study of biological remains from archaeological sites. Through studying human remains in their archaeological context the archaeologist can begin to reconstruct their lives by finding out about where people lived, what they ate, the work they did and the diseases they suffered from. In practice the remains are skeletal, sometimes complete skeletons but often collections of bones or pieces from cremation sites. Soft tissues are preserved in exceptional conditions such as the bog body found at Lindow Moss, Cheshire in 1984 and the Otzi, the Iceman, found in an Alpine glacier in in 1991.

In law all skeletal remains excavated must be investigated and the ethical issues asososciated with the reburial of these remains or their preservation in museums for further research are currently under debate.

Bioarchaeologists attempt to reconstruct peoples life as seen at the point of death. Stature and age at death can be determined from the skeleton as can the sex in the case of adults but it is more difficult to determine this in "non adult" remains. From these details it is possible to draw up a mortality profile. Historical data is sometimes present. When the burials in Spitalfields Crypt, London were investigated by archaeologiss 300 coffin plates were found giving details of the person's age, date of death and some historical data.

Changes cased by disease can be seen in bones and teeth and these changes can be compared with today's knowledge of disease. Trauma, osteoarthritis and infection are often evident whereas , tumours are rare. Some diseases, for example syphilis, have characteristic bone changes which can be recognised most easily in a complete skeleton. The incidence of diseases of this kinds can be mapped across the country.

A high incidence of osteoarthritis was found at Wharren Percy, the site of a medieval village in

North Yorkshire, reflecting perhaps the hard physical life of the medieval peasant. There was evidence of fractures in the diseased bones. A high number of fractures was also found in bones from Norway probably due to the icy conditions.

Bone destruction due to sinusitis is seen. Sinusitis is associated with pollution, allergies, and dental problems. A high incidence was found following an excavation of a medieval cemetery in a poor parish of York associated with local industry.

Examination of teeth can be informative. There is evidence of drilling as early four thousand years ago and of a tooth filled by a rosary bead from a more recent period. Defects in the enamel indicate stress which might have been caused by a dietary deficiency or by diseases such as measles. Dental caries, which suggests a more refined diet with a high sugar content, has increased over the centuries. The greatest rise has been in the post medieval period but there was a peak in Roman times.

Information on where someone lived can be obtained from chemical analysis of bone and teeth enamel. One example is the presence of an isotope of strontium which is also in the soil. Strontium isotope analysis is of special interest for archaeologists as the tooth enamel and bone, where the isotope collects, are formed at different stages of a person's life and by comparing the analysis with geological data, the archaeologist can determine where an individual lived at different times in their life.

Professor Roberts concluded her talk by illustrating the value of her work to modern medicine. For the last ten years it has been possible to extract DNA from biological remains. Ancient DNA enables the expert to investigate questions of human, animal, microbial and plant genetics.

Tuberculosis, a disease which has afflicted mankind for thousands of years and is recognised by skeletal changes, was described. The earliest evidence of the disease is from a skeleton, dated to around 5000BC, found in Italy. In Britain the first skeletal evidence, confirmed by ancient DNA analysis is from the Iron Age (400–230 BC) and further evidence shows it was present in the population of the south of England during the Roman period

The disease was very prevalent in the medieval and post medieval times accounting for up to a quarter of the deaths recorded in London in the 1780s. Improving social conditions in the 19th

century and the introduction of antibiotics in the 20th century saw a steady decline until the 1990s. Since then the incidence has risen steadily and the bacterium which causes the disease has become resistant to antibiotics.

It is now possible to extract ancient DNA from that bacterium. DNA from human skeletons from all over Britain and Europe is being examined to identify strain variations in the bacterium and to see how the strains have evolved over time. A comparable study is being done in Arizona and it is hoped that the knowledge gained from this research will help in the prevention and management of the disease today.

The group thanked and warmly applauded Professor Roberts for a fascinating insight into this branch of archaeology.