'The Science of a Cemetery' —the Ballyhanna Research Project

Catriona McKenzie and Róisín McCarthy carrying out osteoarchaeological analysis of the Ballyhanna remains, IT Sligo. (Photo: Studiolab)

The tenth annual National Science Week took place in November, its declared aim to promote the relevance of science to the future development of Irish society and the economy. That said, past society was the topic of the opening lecture at the Institute of Technology, Sligo, with a focus on what science can tell us about our medieval ancestors.

The Science of a Cemetery was the umbrella title of a series of talks given by researchers from the Ballyhanna Research Project. Funded by the National Roads Authority in collaboration with the Institute of Technology, Sligo, and Queen's University, Belfast, the Project is a four-year research programme centred on the medieval church and graveyard discovered in 2003 on the route of the N15 Bundoran–Ballyshannon Bypass in County Donegal. Buried around a small church at Ballyhanna, Ballyshannon, were the well-preserved skeletal remains of some 1,300 individuals, excavated by Irish Archaeological Consultancy Ltd.

The Project was established as an osteoarchaeological and applied science research partnership so as to retrieve the maximum amount of information about those buried there on the banks of the River Erne. Use of the burial ground spans almost the entire Irish medieval period. The initial tranche of radiocarbon dates indicates burial at the site as early as *c.* AD 700, prior to the Viking plunder of the ecclesiastical sites of the Erne river system. People were still being laid to rest there as the earls took flight in the seventeenth century.

Osteoarchaeological analysis of the skeletal remains is now complete. It has produced an extensive catalogue of illness, disease, trauma, age at death and standard skeletal data, adding significantly to our knowledge of medieval Ireland. The synthesis and comparative assessment of these data is ongoing. This work is led by researchers at QUB—Dr Eileen Murphy, Catriona McKenzie and Dr Colm Donnelly—and assisted by Clare McGranaghan and Róisín McCarthy (at IT Sligo). This analysis is coupled with a rigorous radiocarbon-dating programme and historical documentary research that will provide a chronological structure within which to interpret the emerging osteoarchaeological and scientific data. A stratigraphical reconstruction of the burial sequence, being carried out by Philip Macdonald and Naomi Carver at the QUB Centre for Archaeological Fieldwork, allied to the ^{14}C dates, shows how the graveyard physically evolved over the centuries of its use.

Tasneem Bashir at IT Sligo, with Dr Ted McGowan, is carrying out multi-elemental analysis of certain burials. This applied scientific analysis tells us about the environment in which the Ballyhanna people lived and gives insights into the components of their diet. While extraordinarily high levels of iron detected are likely to be due to the absorption by the bones of this element from the surrounding soil after burial, spikes in other trace elements, such as lead, are not so easily dismissed and interpretation of the results is ongoing. Indications of a mixed coastal–terrestrial diet will add to the continuing discussion of the socio-economic and dietary structure of medieval Ireland.

The final component of the Project is genetic analysis, being carried out through IT Sligo. Sheila Tierney and Dr Jeremy Bird are engaged in the difficult task of extracting and amplifying ancient human DnA (aDnA). With the necessary and much-appreciated support of the National Museum of Ireland throughout, further collaborative partnerships by IT Sligo under the Project umbrella have been established in this field with institutions in the UK and the US. This research may offer a glimpse of the exciting potential for archaeological skeletal remains to contribute to our understanding of disease in the past. Knowledge of the historical genetic development of certain conditions that prevail today throughout Ireland and elsewhere is seen as an important step in understanding the evolution of human hereditary diseases. Research is currently under way into identifying genetic allele mutations linked to cystic fibrosis and tuberculosis.

The Project represents a benchmark for the potential of future integrated scientific studies of the skeletal remains of past societies. It showcases the ability of third-level institutions and partnerships with them to extract knowledge from material generated by archaeological excavation. The work of the Ballyhanna Research Project contributes much to our knowledge of life and death in medieval Ireland. Perhaps it is in the area of genetic disease studies that the Project will some day be seen in some small way as best rising to Science Week's aim of seeing the relevance of science as contributing to the future development of Irish society.

The results of the Ballyhanna Research Project will be published as an NRA monograph in 2010/11.

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