Multi-element Analysis of *Human Bone*

Ted McGowan, lecturer in the School of Science, Institute of Technology, Sligo, decribes one aspect of the analysis being conducted.

Trace element concentrations in archaeological bone facilitate insights into the dietary, social, environmental and toxicological influences on ancient populations. This MSc research being conducted on the Ballyhanna skeletal assemblage will aim to analyse samples and discover what they can tell us about the people who lived and died in this medieval community. Representative samples of male, female and child bones from the Ballyhanna population will be studied, and it is hoped this will lead to information that will supplement the other areas of research. The MSc research project is being carried out by Ms Tasneem Bashir MSc, based in the Institute of Technology, Sligo, and led by Dr Ted McGowan.

Strontium, calcium, barium, magnesium, manganese, iron, zinc and copper concentrations in bone have all been found to correlate with diet. A diet rich in seafood and marine resources generally tends to show high levels of strontium and magnesium, but low barium concentrations; more terrestrial diets generally result in low concentrations of strontium and magnesium, but high concentrations of barium. A herbivorous diet is high in strontium, barium and magnesium, but low in concentrations of zinc, while the opposite applies to a carnivorous diet. This research will also search for toxicologically significant elements, such as lead and cadmium. Elevated concentrations of these elements may reflect specific environmental and health indicators within an archaeological population.

A variety of analytical techniques will be employed to conduct and complete this analysis. These will include Graphite Furnace Atomic Absorption Spectrometry, Flame Atomic Absorption Spectrometry, Flame Atomic Emission Spectrometry and the modern Multi-element Atomic Spectrometry techniques of Inductively Coupled Plasma-Mass Spectroscopy and Inductively Coupled Plasma-Atomic Emission.