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Ear bone can offer vital clue in quest to identify human remains

Forensic researchers have uncovered a way of identifying the sex of human skeletal remains – by measuring the inner ear.

Anthropologists who examined the skulls of adults found that the dimensions and size of the bony labyrinth – the outer wall of the inner ear – could indicate the sex of remains.

Forensic researchers at the University of Edinburgh took CT scans of dozens of skulls from a contemporary skeletal collection in Crete. They found that males consistently had a larger, differently shaped bony labyrinth compared with females.

The researchers suggest the findings could help to identify remains recovered from both forensic and archaeological sites.

Although male and female measurements of the bony labyrinth differed by less than a millimetre, researchers were able to predict sex with 84 per cent accuracy.

Researchers say the bony labyrinth can be used to identify the sex of children, as it matures before birth and shows a difference between the male and female forms.

Sex estimation of adult skeletal remains is usually done by examining the shape of the pelvis or the size of the long bones which have developed following puberty. As children's bones are not fully developed the bony labyrinth – which is fully formed by birth – provides key evidence.

The bony labyrinth is a cavity on the temporal bone that protects the tissues for hearing and balance. The temporal bone is the more resistant part of the skull and often survives the decaying fossilisation conditions that destroy most other bones.

Dr Elena Kranioti, of the University of Edinburgh's School of History, Classics and Archaeology said: "There currently exist few methods for accurately sexing immature individuals and fragmented remains with a high degree of confidence. This method of the bony labyrinth appears to be as accurate as or better than other techniques for identifying the sex of juvenile human remains."

The study is published in the *American Journal of Physical Anthropology*. It was carried out in partnership with scholars from the Universities of Crete, Greece and Tübingen, Germany. For further information, please contact:

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