

Summary Write Up of the DGAG Talk Tuesday 20 Oct 2026

Title: Listening to the past: The extraordinary evolution of the mammalian middle ear

Speaker: **Dr James Rawson** finished his PhD in Bristol last year and has just started a new job as a Postdoctoral Research Fellow at King's College London. The talk was thoroughly enjoyed by an audience of 15 people. Unfortunately, we cannot reproduce exactly the talk without the author to explain the slides, their context and answers to questions. However, the speaker has kindly allowed us a summary PDF version of his slides. This is on the DGAG website to assist in education and future reference. Below is my (Editor) talk highlights from some rapidly scribbled notes. Hopefully, this is enough to stimulate increased searching for these elusive mammal fossils in UK sequences. However, for those wishing a literature based “deep dive” I am sure additional references/links to that below are available via contact with the speaker.

Talk Summary Highlights

James treated the audience to an engaging and “tour de force” (for us) review of the development of our middle ear from our early ancestors way back from the earliest Triassic age and now extinct group of Cynodonts. The complexity of multiple mammalian branches developing at different times a set of similar middle ear and lower jaw bones was ably shown. Modern techniques (CT scanning, synchrotron) were clearly shown to be crucial to reveal the detail of these generally small (shrew/rat size fossils)

- Existing mammal groups have about 6,900 different species with a vast/diverse array of adaptations for living in air, water and land. 3 extant groups today are the Monotremes, Placentals (Including us) and Marsupials
- Extinct mammal groups go back to Late Permian and include the Cynodonts that died out eventually in the Early Cretaceous – most of the species were dog or domestic cat size with size range from mouse to bear size. Cynodont fossils show the early breakthrough development of ear bones from the lower jaw parts of the Tetrapod type skull to more early mammal types. This interpreted evolutionary breakthrough was also supported by modern math/physics modelling and interpretation of embryo studies.
- The important Cynodont finds have been made in Brazil/Argentina in Triassic red beds that look remarkably similar in depositional setting to the UK sequences
- Another emerging area for important finds are Mid Jurassic sequences at Kilmalaug – Isle of Skye. Watch this space for more papers about to be released.
- A key aspect to finding these type of fossils is looking for the subtle and very small (microscopic almost) clues to a fossil presence. Then repeated cutting and CT scanning to reveal the full glory of what is “hiding in plain sight”

- Next DGAG talk is scheduled for Tuesday 17th November , speaker Dr Anjana Khatawa: The Whispers of Rock – details in the events section of DGAG website

- A speaker is required for the talk slot 20 Apr 2026, any topic loosely connected to the Earth (even Solar System!) and science will be considered, we like variety! In addition, speakers are required for the late 2027 slots from October 25, 2027 to April 2028 - I know it is a long way away! Please check all your contacts and networks for a speaker and let me know contact details.

Chris Webb

DGAG Events – Editor

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Additional Links

1. Speaker recommended paper based on the introductory photo :
<https://www.science.org/doi/10.1126/science.aay9220>