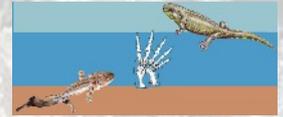


# TW:eed



## Tetrapod World: early evolution & diversification

### Newsletter No. 10, Aug, 2015

At the end of June, our long-awaited excavation of the bed of the River Whiteadder near Chirnside finally started. To get started on a major excavation such as this, involving regulatory bodies, landowners and scientists, requires persistence and planning. There needs to be good fortune too, and we were lucky that the weather stayed reasonably dry, and the water levels in the river stayed low.

A company called [OnSite Central](#) installed a partial dam about half-way across the river and pumps were installed to clear the remaining water and then drain what seeped from the river bed so we could work without having to sit in puddles.



Throughout the three weeks of the excavation, staff from the National Museums Scotland drove down every day. They were helped by staff and volunteers of the British Geological Survey, Universities of Leicester and Cambridge, the Hunterian Museum (Glasgow), and joined by Maggie Wood for a day. A workman's hut (with toilet and kettle) and generator, and a burly workman (Derek) from Rodger Builders Ltd wielding a pneumatic drill, made the task easier.

Once we'd worked out which bed the bones came from, which Stan called the Amphibian Bed, the main work involved lifting and splitting blocks of sediment, looking for fossils, then labelling, wrapping and recording them, before packing into crates for transport back to Edinburgh.

Who attended on any one day varied quite a lot, but the overall project was overseen by Andy Ross, arthropod specialist at the NMS. It became apparent that immediately below the Amphibian Bed was a bed full of very nice plant fossils, so Andy concentrated on extracting fossils from that bed, while everyone else looked for bones.

In the first week Carys Bennett and a student (Levi) from the University of Leicester logged the section formally. The team used notes from the late Stan Wood's collection that recorded the various levels he'd encountered along with the sorts of

fossils he'd found in each. Stan's observations and discoveries, incredibly, made below water level, are the reason we excavated this location and his records underpinned our current sedimentological analysis. Carys' log, measured seeing the dry exposure, places the fossils in a newly measured section. The sedimentology at the excavation site can now be consistently compared with the consortium's other measured sections, including Burnmouth and the Norham core.



In the second week, Jenny and Rob Clack came up from Cambridge, while Janet Sherwin and a student (Jess) joined us from Leicester. We spent much of our time splitting rocks, and Jenny was delighted on the first day to find a tetrapod skull. This photo shows part of it, which came away from the main block. This piece is part of what's called the skull roof, which is the flat part behind the eyes.



At first, we thought the curved edge (labelled pineal foramen) was the edge of an orbit, but when she had it CT scanned back in Cambridge, Jenny realised that was the edge of the pineal opening, a smaller hole on the mid-line of the skull. We can't wait for the rest of that block to arrive in Cambridge so we can see what else is there. We made no attempt to excavate the rest of the skull, as the rock disintegrates into polygonal blocks as it dries out and it's really hard to know how to deal with it without destroying the fossils inside.

Jenny also gave a talk to the local Chirside community, organised on our behalf in the [Waterloo Arms Hotel](#) by Oliver Kieran from Burnmouth. She'd been unsure whether or not she'd be able to get up to the Borders at all, and was only able to give Oliver about a week's notice, which simply wasn't enough, so sadly, despite his best efforts, not many people could attend.

We had expected to eat in the pub beforehand, and were dismayed to learn when we arrived that they don't serve food on Mondays and Tuesdays. You can imagine our amazement and delight when the landlord phoned his chef, who turned out especially for us and cooked us delicious scampi and chips! That was well above the call of duty, and we really appreciated it!

Following Jenny's talk, the attendees passed on the news of our activities to their friends and relatives and the end result was a steady stream of visitors to the site. People stopped by to chat, ask about what we were doing, look at the excavation and at some of the specimens we'd found. We were very pleased that so many locals were interested enough to make the effort to drop by and talk to us.

The following week, Carys was back logging with a different student (Graham), now recording the freshly exposed section left after samples had been taken. During this week many fossils were collected and packaged up. It was clear there was not enough time to split all the Amphibian Bed that was then exposed so blocks were dug out and taken as they were. In all, several cubic metres of river bed were lifted, although much of that had nothing in and was not removed. 13 pallets of material were taken away packed with slabs of rock and 86 plastic crates containing 863 specimens.



As well as Jenny's tetrapod, there were many spectacular plant fossils, fish and arthropod remains. The photo above shows some of the plants. The black area, with grey spots on it, is the bark of a type of plant called a *Lepidodendron*, and the grey spots are leaf scars, where the leaves have fallen away. Andy Ross, being an arthropod specialist, was also particularly pleased to find a decent scorpion towards the end the excavation.

Eventually it was time to put the site to rights. Everything was tidied up, the waste rock put back in the hole, and OnSite came and took away the dam, leaving the river looking as it had done before we started. Now the really time-consuming part starts - unpacking, preparing, conserving, databasing and studying the fossils, and working out what they can tell us!

Project blog: <http://www.tetrapodworld.com>



Yves, Andy and Sarah (NMS), Carys (Leicester), Derek (Rodger Builders) and Geoff (Leicester).

## Field Trip to West Virginia



Tim and Sarah at one of the many road cuts they investigated. Photograph Stephanie Pierce

During July 2015, Tim Smithson and Sarah Finney headed to the mountains of West Virginia, USA, with Associate Partner Stephanie Pierce from the Museum of Comparative Zoology, Harvard University, where Alfred Romer was once Director, and Gordon Baird from New York State University. They were following in the footsteps of a field party sent out by Romer in the

1950s to find early Carboniferous tetrapods. Although the 2015 team had access to an excellent field notebook to guide them, the prospecting was hard work.

The geology of West Virginia is complicated, with the Devonian and Carboniferous rocks thrown into a series of folds during the formation of the Appalachian Mountains. The exposures are nearly all road cuts and fossils are scarce. They did have some success and returned to the Museum of Comparative Zoology with some nice fossil plants, a few bivalves and suite of disarticulated vertebrate remains. Time will tell if these include the elusive Romer's Gap tetrapods. Some interesting fossil preparation lies ahead.

To follow progress on the West Virginia collection please use the link below

<http://projects.iq.harvard.edu/spierce/field-work>

## Futures

Several team members will present at the Symposium of Vertebrate Palaeontology and Comparative Anatomy in Southampton in September. The biannual team meeting will take place there, too.

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