

# BIANNUAL NEWSLETTER OF THE PALAEONTOLOGICAL SOCIETY OF SOUTHERN AFRICA

(HALFJAARLIKSE NUUSBRIEF VAN DIE PALEONTOLOGIESE VERENIGING VAN SUIDER AFRIKA)

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**Front cover:**

*A fine specimen of a symmetrical hermit crab (paguroid), found by Dr Emese Bordy and her students in lower Cretaceous Sundays River Formation sediments near Port Elizabeth (c.135 Ma). A definitive identification is in the pipe-line. Dorsal view on left and is specimen 120mm long. (Photo: Billy de Klerk).*

## EDITORIAL

The year 2015 has kicked to an energetic start and judging by the contributions, that I have received for this PalNews issue, our members certainly were very busy during the second half of 2014. It took a while for folk to settle into the year after the Christmas break and my second email prompt for contributions certainly had the desired effect providing us with a bumper PalNews issue - 66 pages. I was really pleased to see so many more contributions from our international members who are doing work in other African countries and also abroad.

At the outset I think that a vote of **CONGRATULATIONS** must go to **Dr Roger Smith** at Iziko Museum Cape Town. In December'14 Roger was informed by the National Research Foundation (NRF) that he had been awarded an A-Rating in research. This, for his sustained and internationally recognized research output in palaeontology and other spheres of geology. Roger is only the second museum based palaeontologist in South Africa to be awarded an A rating - the other being Dr Bob Brain when he was based at the Transvaal Museum in Pretoria. Well done Roger!

Putting this issue of PalNews together made me so aware that our Palaeo-Community in SA is a busy and vibrant group of scientist. Projects being undertaken by students and institutional staff cover a range of fascinating topics at the ESI (Wits), Iziko Museum, Albany Museum and the National Museum. In addition, it is rewarding to see work being undertaken in Namibia (p. 10, 15 & 17), Zambia (p.51) and Kenya

(p.4). In particular it was nice to get a comprehensive report of the activities from the UCT Palaeobiology Research Group headed by Anusuya Chinsamy-Turan. By far the bulk of the contributions in this issue came from staff and students at the ESI, Wits where Bruce Rubidge, Francis Thackeray, President Marion Bamford, Lucinda Backwell and Jonah Choiniere have been "on their palaeo toes". Their post-graduate student numbers just seem to keep on increasing all the time.

Congratulations to **John Long** at Finders Univ., Australia on figuring out the mysteries of Devonian vertebrate sex - their paper in Nature certainly made international news (p.9).

On behalf of the PSSA I'd like to wish **Heidi Holmes**, in NSW Australia, a special happy birthday on reaching her 70<sup>th</sup> year - great that you are still so active in Palaeobotany.

In closing I would like to thank all PSSA members for contributing to a bumper issue. Cheers!



*Billy de Klerk (ed)*



## PRESIDENT'S CORNER - Marion Bamford

ESI at Wits [Marion.Bamford@wits.ac.za](mailto:Marion.Bamford@wits.ac.za)



After the very successful PSSA'14 conference at the ESI (Wits) I went to Laetoli in Tanzania with Christine Steininger and two Honours students, Kathleen Dollman and Silindo Mavuso. We joined Charles Muciba's field team for a joint palaeoecological project. We also visited Olduvai Gorge and they were all very happy to see these famous sites



Photo of our group in Tanzania on Naibor Soit (Hill) with Olduvai Gorge in the background. (l-r) seated: Adriana, Elisha, Tim; standing Marion, Henry Bunn, Silindo and Kathleen.

I spent the whole of August at Olduvai for my annual field season with the Olduvai Landscape and Palaeoanthropology Project. A drilling team put in four cores and theses will be analysed in due course. Apart from a short trip to Barcelona for a workshop to write a funding proposal for the Olduvai project I spent the rest of the academic year lecturing. A personal highlight for me was being elected as a member of the South African Academy of Science in October (see below). One of my students, Moshood Olayiwola graduated with his PhD in

December. His thesis was on the palynology of three boreholes cores from the offshore Nigerian Basin.

**Cheers till next time - Marion**

**At the Annual Awards & Inauguration dinner in Pretoria, on 14<sup>th</sup> October, Prof Marion Bamford was inducted as a member of the ASSAf.**



**Congratulations to Prof Marion Bamford!**

The Academy of Science of South Africa (ASSAf) was inaugurated in May 1996 by the former President of South Africa and patron of the Academy, Nelson Mandela. It was formed in response to the need for an academy of science congruent with the dawn of democracy in South Africa - activist in its mission of using science for the benefit of society. ASSAf is the official National Academy of Science of South Africa and represents the country in the international community of science academies.

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**Roger Smith - Dept. Karoo Palaeontology, Iziko South African Museum, Cape Town.**

Iziko SA Museum is undergoing a major works program dubbed "the courtyard project" that will allow the public to view modernized and enlarged collections spaces and revamped preparation labs from viewing corridors. The building has caused considerable disruption to the collections as they have all had to be moved into temporary (2-3 years) storage spaces. Luckily, the Karoo collection has only moved down to the first floor and under the diligent supervision of Zaituna Erasmus we continue to cater for a steady stream of research visitors.





Cindi preparing in the demo-lab with the new AOP funded down-the-microscope video attachment.

In the prep lab **Sibusiso (Sibu) Mtungata** is working on the largest of the Namibian Early Permian amphibian skulls that he found in the Huab valley last year- it has an intricate dermal sculpture which is testing his abilities to the limit but he is certainly up for the challenge. **Nolusindisu (Cindi) Mtalana** is working through the 3 sets of paired-up *Diictodon* skeletons that we have recovered from Fraserburg district last November.

**Zaituna (Tuna) Erasmus** still heads up the lab but has also stepped into **Sheena Kaal's** vacant niche and very capably

taken over responsibility for the collection. She is currently micro-preparing another "nest" of *Dicynodon* zone younginids that volunteer **Mike Strong** found in one of Pia Vigliettis' study sections near Nieu Bethesda last year. Visiting French intern **Guillame Louval** is currently rendering a micro CT scan of the specimen, but finding it very difficult with over 1000 bony elements to define, so he is finding it much easier to have the specimen prepared at the same time. **Georgina Farrell** is continuing to uncover the most complete mid Permian *Endothiodon bathystoma* skeleton ever found and is planning to be finished by July when **Ken Angielczyk** will come and give us his opinion as to its research potential.



Georgina Farrell excavating a large skull and anterior skeleton of a gorgonopsian that she found near Fraserburg on the Friends of the Museum excursion last year.



An almost complete *Endothiodon bathystoma* skeleton being prepared by Georgina Farrell.

Last November the Karoo Palaeo team (and **Guillame**) spent two weeks collecting the Mid-Late Permian transition in the Fraserburg district - we now have 187 in situ specimens logged from this 154m thick section that includes the large exhumed Reiersvlei palaeomeander belt. Notable specimens collected include two Pareiasaurian skeletons- one with both hands and feet preserved which is quite rare, another skull of the primitive gorgonopsian *Eriphostoma* that **Christian Kammerer** has just described, this one with some post crania which may prove to be very interesting, several paired-up *Diictodon* skeletons and some small therocephalians that **Fernando Abdala** has help is to identify.



Karoo palaeo team trying to turn over a plastered mid-Permian pareiasaur skeleton near Fraserburg.



Last December I spent 12 days in the Karoo with a crew from NHK TV Japan doing a 3 part documentary on the origins of parental care. We visited the Fraserburg footprints, a nearby *Diictodon* burrow site and a *Thrinaxodon* burrow site on Wapadsberg. Spent the last 2 days with Jennifer looking at her adult/infant *Trirachodon* specimen. State-of-the-art 4K photography using drone mounted go-pros etc. The Japanese TV version will be dubbed, but hopefully an original English version will be available next year.

Whilst in the field Hamish phoned to tell me that I had been awarded an **A rating by the NRF** review panel which made me pretty happy and I am now the second A-rated scientist in the museum sector - the first of course being Dr Bob Brain. With this being my last year of paid employment it comes a little late to be of real benefit, however I am considering my options for post-retirement research opportunities.

This year will be pretty busy with fieldwork on collaborative projects with **Cisneros/Angielczyk** and **Frobisch** in Early Permian of Brazil in March, **Sidor/Angielczyk** and **Nesbitt** in Triassic of Tanzania in June, **Marsicano** et al in the Early Permian of Namibia in August and my Mid Permian Karoo project in November. I also plan to attend SVP in Dallas in October followed by a research visit to **Chris Sidor's** lab in Seattle.

#### RECENTLY PUBLISHED PAPERS

STERLING J. NESBITT, CHRISTIAN A. SIDOR, KENNETH D. ANGIELCZYK, **ROGER M.H. SMITH**, LINDA A. TSUJI (2014 Nov)

A New Archosaur From The Manda Beds (Anisian: Middle Triassic) of Southern Tanzania and its Implications for character optimizations at Archosauria and Pseudosuchia. *Journal Vertebrate Palaeontology* 34:1357-1382

KENNETH D. ANGIELCZYK, SÉBASTIEN HUERTAS, **ROGER M. H. SMITH**, NEIL J. TABOR, C. A. SIDOR, JEAN- SÉBASTIEN STEYER, LINDA A. TSUJI, AND NEIL J. GOSTLING (2014) New dicynodonts (Therapsida, Anomodontia) and updated tetrapod stratigraphy of the Permian Ruhuhu Formation (Songea Group, Ruhuhu Basin) of Southern Tanzania. *Journal of Vertebrate Palaeontology*.34:1408-1426

SHELDON, N D., CHAKRABARTI, R., RETALLACK, G.J., **SMITH R.M.H.** (2014) Contrasting geochemical signatures on land from the Middle and Late Permian extinction events *Sedimentology* 61:1812-1829

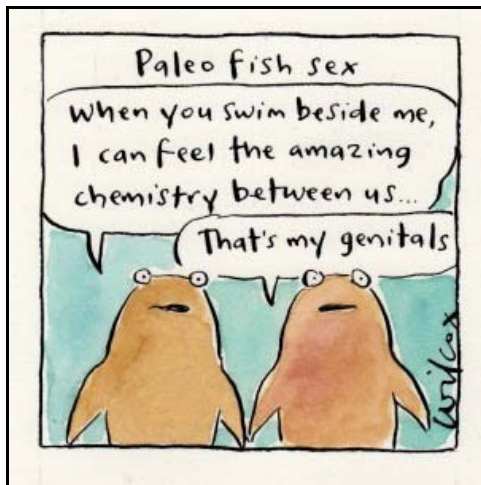
CHRISTIAN A. SIDOR KENNETH D. ANGIELCZYK, **ROGER M. H. SMITH**, ADAM, K. GOULDING, STERLING J. NESBITT, BRANDON R. PEECOOK, J. SÉBASTIEN, STEYER, and STEPHEN TOLAN (2014) Tapinocephalids (Therapsida: Dinocephalia) from the Madumabisa Mudstone Formation (Lower Karoo Group, Mid-Zambezi Basin) of southern Zambia *Journal Vertebrate Palaeontology* 34: 980-986.

oOo



### John Long – Flinders University, South Australia.

Prof John Long, Flinders University, South Australia, was busy last year working on the discovery of reproductive structures in antiarch placoderms. John and his team has discovered that the origin of internal fertilisation for all vertebrates took place at the node when jaws first evolved in antiarch placoderms. New specimens of the Middle Devonian placoderm *Microbrachius dicki* from the Orkneys in Scotland showed the males had rigid paired bony claspers fixed to the dermal armour, and females had separate small genital plates to help lock the claspers in position for mating. John's team made a short animated movie showing how the fish probably mated: arm-in arm square-dance style, sideways. **See** <https://www.youtube.com/watch?v=kkqocRXea3M> (This interview with John is well worth watching!! The discovery made huge media headlines around the world- there are many links to it. Ed.)



The work was published in *Nature* (Jan 8<sup>th</sup> 2015) but further investigations into the new material John collected in the Orkneys in late October with micro-CT scanning are underway for a more descriptive paper.

John has also been busy finishing the description of the new shark from the Late Devonian Gogo Formation of Western Australia, a 3D preserved partial skull with jaws, teeth, scales and shoulder girdles preserved. Other projects in train include the description of a new Moroccan placoderm (*JVP*, early 2015), and a paper analysing the possible role of selenium in three major mass extinction events (*Scientific Reports* in review).

Other papers that should come out later in 2015 include a review of the contribution by Sir Arthur Smith Woodward to Australian palaeontology (with Susan Turner), and a paper discussing evaluation of the scientific significance of fossil sites (*Museum Victoria Memoirs*). John is currently supervising two new PhD students: **Ben King** on the origins of electroreception in early vertebrates, and revision of Tertiary teleost fossils of Australia with **Louise Manuel**. This year will see the Early Vertebrates/Lower vertebrates Symposium held in Australia (August 3-7) for which John is leading a field trip to the Gogo sites with Kate Trinajstić in late July. Currently John is also serving as the President of the Society of Vertebrate Paleontology, which keeps him very busy.

**Cheers for now – John**

oOo

## Brigitte Senut - Tracking African Mammoths

Brigitte Senut, Martin Pickford and Loïc Ségalen

Within the framework of a program **Southern Africa research: Mio-Pliocene Environmental Transitions** financed by Sorbonne Universities and which groups together researchers from IStep (UPMC), UMR 7207 (CNRS) and UPR 2147 (CNRS), field work was carried out August, 2014, in the Etosha Basin, northern Namibia.

At more than 5000 km<sup>2</sup>, Etosha Pan is one of the largest in the world. Its geological history was poorly known because of a lack of data concerning its stratigraphy and age. During our first surveys carried out in 2007 and 2008, we discovered fossil plants, invertebrates and vertebrate remains in various horizons located in the pan and on its flanks. For the first time, deposits from the Miocene to terminal Pleistocene (Pickford and al., 2009-2013; Miller and al., 2012) were identified: Upper Miocene levels cropping out in the floor of the pan and Pliocene and Pleistocene beds (20 metres thick) exposed in small islands and relief in the pan and on its margins. The discovery of Mio-Pliocene fossils in Etosha is important as it fills a large geographical gap on the map of African palaeontology for the period between 8 and 4 million years ago.



General view of Etosha Pan. The Ekuma River is the westernmost of the two rivers flowing south into the northwest corner of the pan.

In the Mio-Pliocene sediments (close in age to those at Langebaanweg, South Africa) which crop out on the shores of the Ekuma River the first remains (a scapula, fragments of teeth) of a Proboscidean attributed to a mammoth, *Mammuthus subplanifrons* were found in 2007. In 2008 the floods swept mud out of the valley exposing abundant lower Pliocene fossils in the sandstones of the Ekuma Delta Member. But the water was too deep and we could not excavate the proboscidean at that time. Last year the river was much lower so we could finally access this "mammoth". And bingo! The rest of a sub-complete



skeleton was excavated. Fossil remains of this proboscidean were already known in Africa, but this is the first time that such a complete skeleton has been discovered.

The identification as *Mammuthus* is delicate as the Ekuma proboscidean is close to the dichotomy of the mammoths and the Indian elephants (*Elephas*), but is very different from the African elephant (*Loxodonta*). For those who like solving taxonomic puzzles, in much of the literature many fossils of these ur-mammoths have been attributed to *Archidiskodon* or *Elephas*.

The fossil sites of the Ekuma River are not accessible by vehicle, because the river enters the pan in a deltaic system. The river must be crossed by foot.



After 3 hours of driving along the banks of the Ekuma River trying to avoid the damp patches and the aardvark burrows, we cross the last almost-dry arm of the Ekuma Delta before setting up camp



Arrival near the Ekuma River



Before setting out on this adventure, we were not sure if the river would still be dry and Murphy's Law, being what it is, ensured that when we arrived, even though the water was much lower than in 2008 (we crossed with water up to mid-thigh, even higher) it was rather deep in places. The difficulty is that the area is full of elephants, which also cross the river and their footprints are deeply imprinted into the clayey bed of the river. The visibility in water being almost nil, we cannot see the tracks

and occasionally, brutally, find ourselves up to the waist in salty water.



Elephant tracks. On the left, in sand on the river bank; on the right, in the river bed covered by water when the wind blows



Ready for crossing ? !



Many fossils were still under water, but those which are exposed are encrusted by a salty carapace which makes them difficult to excavate and is hard on the hands as the salt is very corrosive. To facilitate access to the fossils, we splash them with water to dissolve the salt



Part of the Franco-Namibian team (**Helke Mocke** from the Geological Survey of Namibia, **Loïc Ségalen** from l'ISep-UPMC and **Brigitte Senut** from the National Museum of Natural History, Paris).





Excavating the skeleton.



Excavation of the Mammoth tusk by **Martin Pickford** and **Dick Mol** was problematic because the tooth had burst at the surface; but after hours of patient work and while fighting against the rising water being pushed in by the wind, it was taken out without damage.



The long bones were excavated successfully. Here the femur (the length of which is close to 1.20 m) and the tibia. All the fossils were plaster-jacketed for safe transport to Windhoek.



This mammoth bone weighs as much as a dead donkey! Floating the plaster jackets across the Ekuma River. A major problem was transporting the fossils! We floated the plaster jackets across the river on a makeshift raft made from 30 litre plastic cans and a fold-away table.



Finally, we left the comfort of our camp at sunrise to drive back through the pan to Windhoek.



**Team:** Daniel the cook, Martin, Dick, Helke, Rennie, Brigitte, Elke, Peter (ranger), Loïc, Otto (ranger), Uwe (logistics)

#### Equipe scientifique

**Dick Mol**, Natural History Museum, Rotterdam

**Remie Bakker**, Manimal Works, Rotterdam

**Elke Möllmann**, Naturhistorisches Museum, Dortmund

**Helke Mocke**, Geological Survey of Namibia

**Loïc Ségalen**, Sorbonne Universités, UPMC Université Paris 06, UMR CNRS 7193 (ISTeP)

**Brigitte & Martin** Sorbonne Universités - CR2P, MNHN, CNRS, UPMC Otto and Peter, Etosha National Park.



## Références

- Pickford M., Senut B., Hipondoka M., Person A., Ségalen L., Plet C., Jousse H., Mein P., Guérin C., Morales J. & Mourer-Chauviré C. 2013. Mio-Pliocene geology and palaeobiology of Etosha Pan, Namibia. *Communs geol. Surv. Namibia*, 14:16-68.
- Miller R.McG., Pickford M. & Senut B. 2010. The geology, palaeontology and evolution of the Etosha Pan. *South African Journal of Geology*, 113: 307-334.

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### **Martin Pickford – Eocliff, Namibia, a name to remember.**

Martin Pickford and Brigitte Senut (Paris) and Helke Mocke (Windhoek).

We've been treating blocks of limestone from the Bartonian (Late Eocene) hard water deposits in weak formic acid and have recovered thousands of micromammalian remains. The occurrence indicates accumulation by owls, which regurgitated their pellets around the spring, probably as they roosted or nested in trees growing near the spring. Over the years a tufa mound some 15 metres thick accumulated, all of which remains today are two outcrops 150 metres in diameter, one at Eocliff, the other at Eoridge 1.5 km away (i.e. reserves of ca 2 million tons of fossil-rich limestone).

What is so exciting about the micromammals from Eocliff?. Well, first, they are by far the best preserved and most abundant Palaeogene mammal fossils known from Africa.

Second, most of the post-cranial bones are preserved along with skulls and jaws, revealing a huge amount of information about locomotion, adaptations to the environment, body proportions, body size and so on. Thirdly, the composition of the fauna reveals that we're going to have to rethink virtually all previously published scenarios about the origins of golden moles (Chrysochloridae), otter-shrews (Potamogalidae) and sengis (Macroscelididae) as well as some of the rodents. Associated with the micromammals are rare macromammals such as giant dassies (Hyracoidea).

But what is particularly interesting about the Eocliff fauna is that it reveals that by the Bartonian southwestern Africa was a biogeographic region quite distinct from the rest of the continent. This is the case today, with the Cape Floral Zone representing one of the six botanical realms of the Earth. But now we have evidence that the heterotrophs reliant on the plants experienced as endemic an evolution as did the plants. Thus the concept of the Cape Floral Realm can be extended to include the mammals (and the non-marine molluscs by the way) which could be called the Cape Faunal Realm. Echoes of this ancient endemism are still present in South Africa, with its high diversity of golden moles and sengis compared to the rest of the continent.

And just to put the cherry on the cake, we've found the first lorisisid primate from Eocliff.

Before signing off, we'd like to pose the question. Is this occurrence unique, or are there other small deposits like it

hiding in other parts of Southern Africa? The target is small, but as we all know "Small is Beautiful !!"

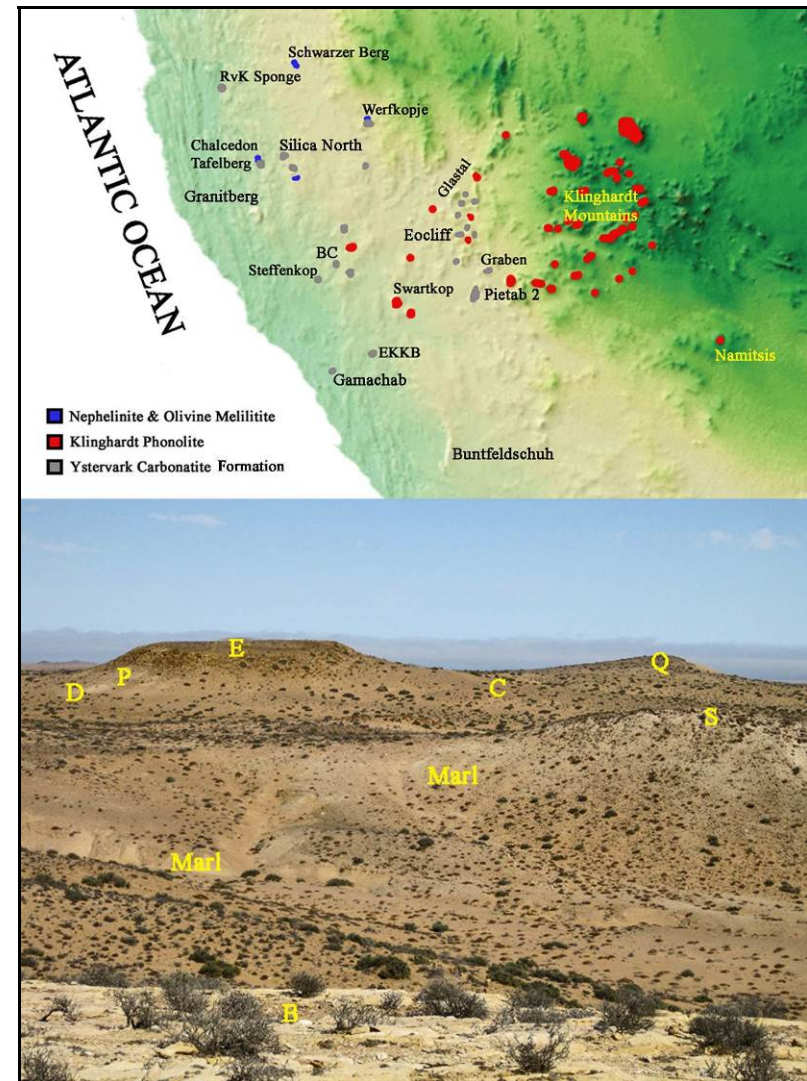
Funded and aided logistically by the Muséum National d'Histoire Naturelle, Paris, the French CNRS, French Foreign Affairs Ministry, the University of Rennes, the Geological Survey of Namibia, the Namibian National Heritage Council, Windhoek, and last but not least Namdeb Diamond Corporation (Pty) Ltd, Oranjemund

(right) Upper frame : Location of the Eocliff locality west of the Klinghardt Mountains, Namibia. Lower frame : View of the east flank of Eocliff with main rock units identified. B - bleached dolomite, C-Namib 2 Calc-crust, D-dolomite, E-Eocliff Limestone P-Plaquette Limestone overlain by Scoria Limestone, Q-Quartzite, S-silicified limestone.



Skull and mandible of a primitive golden mole from Bartonian (Late Eocene) limestone at Eocliff, Namibia. The skull is about 25 mm long.

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**Helke Mocke - National Earth Science Museum,  
Geological Survey of Namibia - Windhoek.**

A field survey was undertaken to the Gai As from the 20 July to the 4 August with Dr Roger Smith, Prof Claudia Marsicano and Dr Adriana Mancuso to find the earliest land dwelling fauna and fill the gap in knowledge of Early Permian fossils in Africa. The project forms part of a National Geographic grant. Several fossils of fishes, fish coprolites and amphibians were collected and are currently being cleaned at the IZIKO Museum in Cape Town for further research.



Trip to Gai As

A highly successful trip was undertaken to the Ekuma River in the Etosha National Park from the 9-20 August to excavate the partial skeleton of a 5 million year old mammoth. This trip was undertaken with researchers from the Netherlands, Germany and France. The highlight of the excavation was the discovery of a short polished tusk, which probably belonged to a mature male individual. The mammoth bones, which include a shoulder blade, femur, tibia and fibula, the vertebral column consisting of 10 thoracic vertebrae, 4 lumbar vertebrae, 5 sacral vertebrae, 2 caudal vertebrae, several ribs and a complete pelvis will be cleaned in 2015 and form part of a spectacular display in the National Earth science Museum in Windhoek. The excavation was filmed for a TV series on the origin of mammoths, which was aired in Germany on Christmas Eve.



**Excavating a mammoth in the Etosha Park**

The 7<sup>th</sup> Congress of the African Association of Women in Geosciences (CAAWG) was held at the Geological Survey of Namibia from the 7-9 November under the theme: Earth Sciences and Climate Change: Challenges to Development in Africa. The congress was well attended by women from all over Africa. A post congress excursion was undertaken to the Namibian coast, visiting the Rössing Uranium Mine, the state of the art Areva Desalinization Plant and the Gobabeb Research

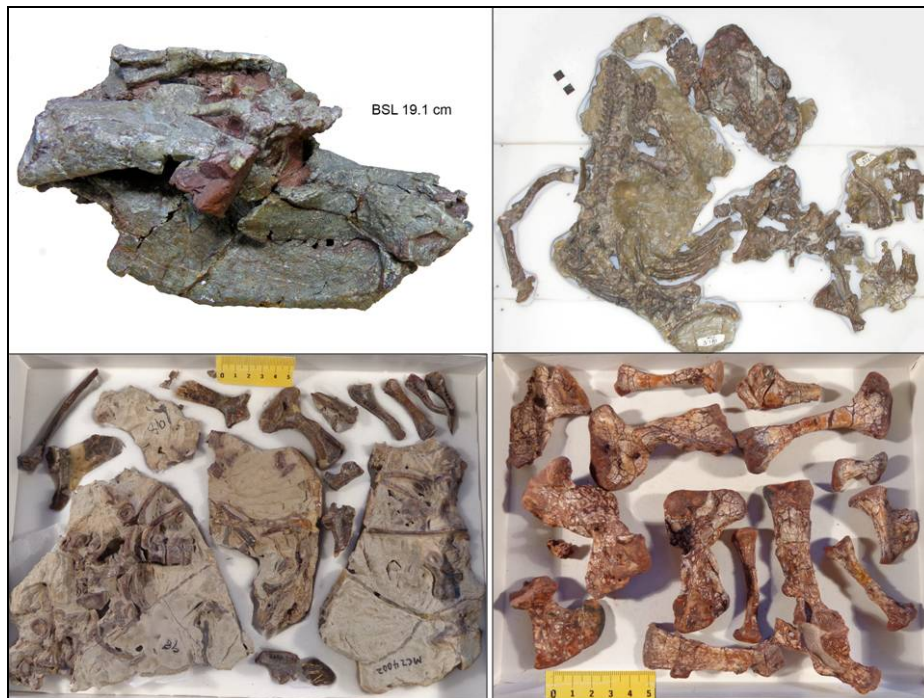
Station where groundbreaking research is taking place on desertification, environmental rehabilitation, natural resource utilization and more.



**The 7<sup>th</sup> Congress of African Association of Women in Geosciences**

Ms Helke Mocke visited the Evolutionary Studies Institute (ESI) at the Witwatersrand University in Johannesburg to continue her research on a rare chiniquodontid cynodont fossil from central Namibia as part of her Masters work.





Various chiniquodontid cynodont specimen from Namibia & South America

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### Heidi Fourie – Ditsong: National Museum, Nat. History

I've kept busy with an audit of the Therapsid collection. This is a precursor of the GRAP 103 which commenced during 2014. I'm doing it numerically and must say I'm in the middle of checking unidentified specimens that my volunteer named livers. Some pieces do not contain any bone and look like ossified liver, not very exciting. It seems that now that the collection is better organised and spread over one floor the visitor number is picking up. So if anyone has a student interested in fossil invertebrates such as mollusca, porifera, etc they are welcome. Ditsong: National Museum of Natural History received quite a large grant from the NRF and we are kept busy with planning and ordering of departmental needs. The research on the muscles of the therocephalian ankle with Dr S. Kümmell and Dr C. Sullivan is progressing well. I've written several popular articles on Wind energy, fracking and Palaeontological Impact Assessments for a local Eastern Cape 'Ken Jou....Know Your Monthly'.

**Publication:** Fourie, H. 2013. Radon detection in Karoo fossil material at the Ditsong: National Museum of Natural History, Pretoria, *Ditsong: National Museum of Cultural History, Research Journal*, **8** :24-32.

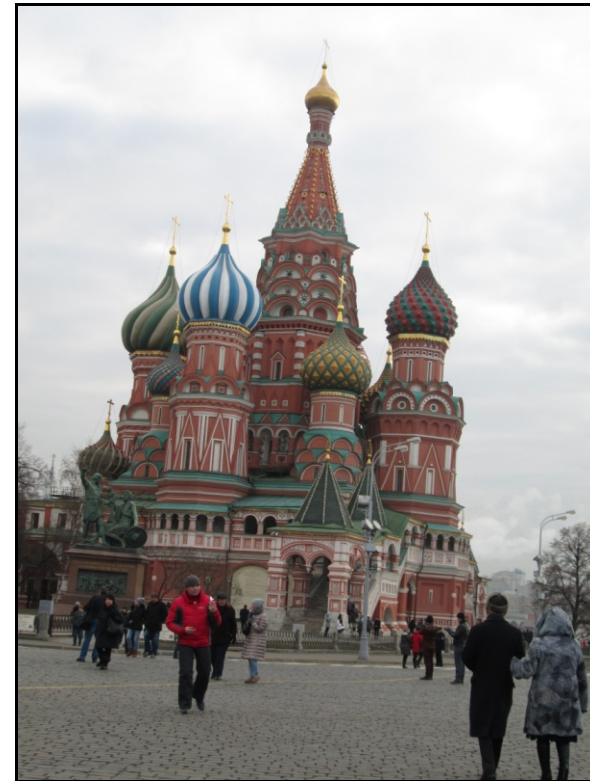
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**Elize Butler – National Museum,  
Karoo Palaeontology Department, Bloemfontein.**

**A Russian experience** - Elize Butler from the Karoo Palaeontology Department of the National Museum, Bloemfontein visited the Palaeontological Institute in Moscow, Russia in November 2014 in order to compare two new gorgonopsian specimens from the Karoo Basin with the endemic *Inostrancevia* of Russia. This research is conducted for her PhD project. The data is currently being analyzed but if the new specimens are related to the Russian specimens it would suggest a global distribution for gorgonopsians.



Preparator of the Palaeontological Institute in Moscow, Russia at work



St Basils Cathedral on the The Red Square in Moscow, Russia

**All best – Elize**



## **UCT Palaeobiology Research Group** (Reporter - Matthew Scarborough)

The UCT Palaeobiology Research Group is a small but thriving group of postgraduate students on the top floor of the UCT Zoology Building, under the supervision **Prof. Anusuya Chinsamy-Turan**. During the last year our lab has pursued diverse research interests on extant crocodiles, molerats, fossil elephants, mammoth and dinosaurs. Our research team is also set to expand in 2015 when two new postdocs, **Christen Shelton** and **Delphine Angst** join us. Here are some of our recent undertakings and highlights from our lab:

**Anusuya Chinsamy-Turan - vertebrate palaeontology: palaeobiology.** 2014 proved to be a hectic but exciting year for Anusuya. In between her HOD responsibilities in our department, she managed to get several research projects off the ground (see publications below) and attended several international conferences. She spoke in special Mesozoic bird symposia at the *EAVP* meeting in Torino (Italy) in July, and at the *International Palaeontological Congress* in Mendoza in Argentina. In addition she delivered a plenary lecture at the *Commonwealth Science Conference* in Bangalore. Anusuya's popular level book, "Fossils for Africa" (Cambridge University Press) was launched at Iziko SA Museum in October with a series of short palaeo-talks by Roger Smith, Romala Govender,

Emil Krupandan and Pippa Haarhoff. Anusuya is looking forward to a stimulating year of more research, writing, and travel - all in the name of palaeobiology!

**Matthew Scarborough - elephant & mammoth evolution on islands.** Matthew has travelled widely to visit collections in Kenya, England, Switzerland, Germany, Italy, France and Greece for his PhD research on the evolution and comparative anatomy of Pleistocene dwarf elephants on Mediterranean islands. A highlight of the last year was his attendance at the *VIth International Conference on Mammoths and their Relatives* in Greece. He also went on the post-conference field trip to the eastern Mediterranean islands of Rhodes and Tilos, where a dwarf elephant skeleton was recently discovered *in-situ* in a cave. After five trips to Europe Matthew has now hung up the travelling coat, and plans to submit his PhD thesis later this year.



A 5m-long *Mammut borsoni* tusk in the Natural History Museum of Milia, Greece.

**Emil Krupandan – sauropodomorph dinosaurs.** Emil is now in the second year of his PhD, after having upgraded from a Masters last year. His research on the anatomy and taxonomic identification of sauropodomorph material from Maphutseng (Lesotho) is heading towards completion, and some results were presented at *PSSA'14*. Recent histological analysis of this large collection has also provided fresh insights into the growth dynamics of transitional sauropodomorpha. Emil plans to present some of this work at the *3rd International Symposium on Paleohistology* in Bonn, Germany.

Emil also recently had the opportunity to attend a workshop on morphometrics (run by Chris Klingenberg at Stellenbosch Univ.), and plans to apply the newly-gained knowledge and techniques to Gondwanan sauropodomorpha. This year he will be sifting through the material previously assigned to "*Euskelosaurus*" in order to determine the taxonomic status(es) and phylogenetic relationships of the masses of material assigned to the "waste-basket" taxon. He also continues to study the phylogenetic relationships of Sauropodomorpha and just recently had a paper on a basal sauropodiforme accepted for publication (with A. Otero, J. Choiniere, A. Chinsamy-Turan and D. Pol).



Emil excavating a basal sauropodomorph (El Tranquilo, Santa Cruz Province, Argentina).



**Vidushi Prema Dabee – crocodile bone histology**

Vidushi is currently in her second year of a Masters, investigating bone depositional rates in the Nile crocodile, *Crocodylus niloticus*. Her study involves using fluorescent labelling to assess osteogenesis in various bones of the skeleton. Her work is also going to determine whether there are different bone depositional rates for males and females in the same environment. She presented some preliminary findings at *PSSA'14* in Johannesburg, and is looking forward to presenting her final results at the *3rd International Symposium on Paleohistology* in Bonn in July 2015.

**German Montoya Sanhueza – Cape dune molerats.**

German has now flown the nest, after graduating last December with a Masters (with distinction) in which he investigated the appendicular bone microstructure of the Cape dune molerat. His study analysed a large ontogenetic series of male and female molerats to investigate patterns of bone growth and differential skeletal homeostasis in different wild populations, with implications for future studies of bone development, mechanics and adaptation. These results were presented at three conferences: *UCT Biodiversity Conference, 2013*; *PSSA'14* and the *14<sup>th</sup> Congress of the Pan African Archaeological Association 2014*. His research also enabled the comparison of histological tissues among different subterranean species, the results of which will be presented at the *Palaeohistology* meeting in Bonn later this year. German has now

returned to Chile but plans to return to Cape Town to continue with a PhD.



German Montoya (left), Valerie Nxumalo from Wits (middle) and Ryan Tucker from U-Stellenbosch (right) at the *PSSA'14* meeting at Wits.

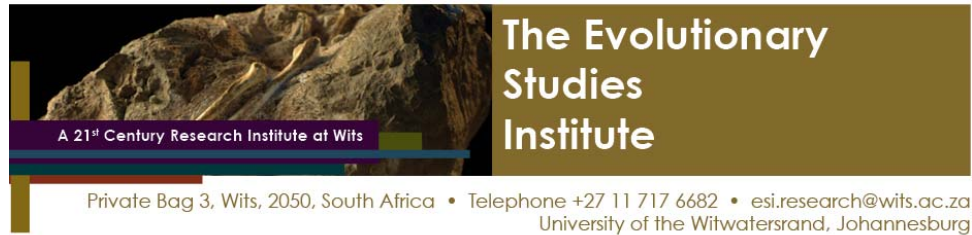
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- Canoville, A., Thomas, D.B. and A. Chinsamy, A. 2014. Insights into the habitat of Middle Permian pareiasaurs (Parareptilia) from preliminary isotopic analyses. *Lethaia*, 47(2), 266-274.

- Cerda, I. A., Pol, D. and A. Chinsamy. 2013 Osteohistological insight into the early stages of growth in *Mussaurus patagonicus* (Dinosauria, Sauropodomorpha). *Historical Biology*, 26(1), 110-121
- Cerda, A., Chinsamy, A. and D. Pol 2014. Unusual Endosteally Formed Bone Tissue in a Patagonian Basal Sauropodomorph Dinosaur. *The Anatomical Record*, 297, 1385-1391.
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- Chinsamy, A., Chiappe, L., Marugán-Lobón, J., Chunling, G. and Z. Fengjiao. 2013. Gender Identification of the Mesozoic bird *Confuciusornis sanctus*. *Nature Communications*, 4, 1381.
- Chinsamy, A, Buffetaut, E, Angst, D. and A. Canoville. 2014. Insight into the growth dynamics and systematic affinities of the Late Cretaceous *Gargantuavis* from bone microstructure. *Naturwissenschaften*, 101, 447-452.
- Govender, R. and A. Chinsamy 2013 Early Pliocene (5Ma) shark-cetacean trophic interaction from Langebaanweg, Western Coast of South Africa. *Palaios*, 28, 270-277.
- Han, G. Chiappe, L. M. Ji, S-A, Habib, M., Turner, A. H. Chinsamy, A., Liu, X, and L. Han. 2014. A new raptorial dinosaur with exceptionally long feathering provides insights into dromaeosaurid flight performance. *Nature Communications*.
- Redelstorff, R. Hubner, T., A. Chinsamy, and P. M. Sander 2013. Bone Histology of the Stegosaur *Kentrosaurus aethiopicus* (Ornithischia: Thyreophora) from the Upper Jurassic of Tanzania. *The Anatomical Record*, 296(6), 933-952.
- Redelstorff, R., Hayashi, S., Rothschild, B. M. and A. Chinsamy 2014. Non-traumatic bone infection in stegosaurs from Como. *Lethaia*, 48(1), 47-55.
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## NEWS FROM:



CENTRE OF EXCELLENCE  
PALAEOSCIENCES



### Lucinda Backwell

A fieldtrip to northern Namibia and Botswana was undertaken in September 2014, and data collection on the research project 'Kalahari Bushman material culture read by community elders' was successfully concluded. Two San villages were visited in Botswana and Namibia to document the meaning and function of a few remaining items in the Fourie Collection, housed at Museum Africa in Johannesburg. Twenty-four hours of footage in conversation with traditional San elders at Museum Africa was subtitled in English and completed. The entire Fourie Collection of San items collected in the 1920s (n. >3000) has been photographically and digitally archived, including Fourie's original glass negatives, and the material for a book on traditional San material culture (past and present) has

been gathered. This research is made in collaboration with Dr. Francesco d'Errico (CNRS, University of Bordeaux, France), Tsamkxao #Oma, Cgonta Bo, Lena Gwaxan Cgunta, Joa Cwi and #Oma Tsamkgao (translator, Nyae Nyae Conservancy, Tsumkwe, Namibia). In 2014 a documentary film on the research project was shown for the first time on French television. Titled "*A Shaman's Journey. The last elders*", the film was produced by MC4, with the participation of *France Télévisions* and *Planète Thalassa* for France 5 Television.

A manuscript titled "Earliest evidence of personal ornaments associated with burial: the *Conus* shells from Border Cave", was written with Dr. Francesco d'Errico. The four to six month old infant, found in association with a perforated *Conus* shell covered with ochre, and deposited in a grave excavated in Howiesons Poort layers dated to  $74 \pm 5$  BP, represents the oldest instance of modern human burial from Africa, and the earliest example of a deceased human interred with a personal ornament. As part of this study we visited the beautiful site of Border Cave, and the nearest beach in search of *Conus* shells to document beach and rock-pool thanatocoenoses.

Collaboration was established with Julie Lesnik (Associate Professor, Wayne State University, Michigan, USA), when we met at the University of Bordeaux in December to work with Dr. Francesco d'Errico on the use of bone tools by chimpanzees, early hominins and modern humans.





Lucinda Backwell and Francesco d'Errico searching for *Conus* shells at Hulley Point, northern KwaZulu-Natal.

During this trip bone tools used in recent digging experiments in subterranean termite colonies at the site of Malapa were microscopically observed and discussed, and replicas of the tips of the tools were taken for analysis using optical profilometry and confocal microscopy. Our aim is to refine the functional interpretation of early hominin bone tools from the Cradle of Humankind, South Africa, by applying 3D texture analysis software to quantify and compare the wear patterns created experimentally when digging in termite colonies at Malapa, with those recorded on more than 100 archaeological specimens from Swartkrans, Sterkfontein and Drimolen, dated 2-1 Ma.

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- Taru, P. and Backwell, L. 2014. Hair morphology of some artiodactyls from southern Africa. *Annals of the Transvaal Museum*. **4**: 26-32.
- Backwell, L.R. & d'Errico, F. 2014. Palaeolithic bone tools. In C. Smith (Ed.) *Encyclopedia of Global Archaeology*, Vol. 2. Springer, New York, pp. 950-962. Print: ISBN 978-1-4419-0426-3; Online: ISBN 978-1-4419-0465-2

### Jonah Choiniere, ESI at Wits

No rest for the weary after PSSA! In August, my colleague **Dr. Roger B. J. Benson** from the University of Oxford, UK, came to Wits to do some collaborative fieldwork in the Elliot Formation. We were joined by **Dr. Zubair Jinnah**, from Wits Geosciences, and by my graduate students **Kimi Chapelle** and **Blair McPhee**. Thanks in part to the hard work of Blair and **Natasha Phillips**, whose exploratory mission had discovered a fine bonebed in the lowermost Elliot back in June, our trip was a major success! We also had the pleasure of meeting the "**Dinosaur Lady of Lady Grey**," a national treasure if ever there was one. Many thanks are in order to **Hannie** and **Nellie van Heerden**, who own the farms where we did much of our collecting, to **Ben McLennan** and his wife **Gillian** who

facilitated our visit and found many of the fossils. To **Soon** and **Elsie Cloete**, who provided access to their property, and to **Vlok** and **Cora-Mart Oosthuizen** who let us stay on their beautiful guest farm, collect their dinosaurs, and fed us well the whole time.



Jonah Choiniere, Roger Benson, and Blair McPhee clear scree off of a dinosaur bonebed in the lower Elliot Formation near Roussouw.



(right) Blair McPhee and Jonah Choiniere opening up the bonebed near Roussouw. (left) Proof that Blair McPhee actually will do some work around camp from time to time.



A late winter storm brought much needed rain to the Oosthuizen's farm Saffier (near Lady Grey). Too bad we were out prospecting in it.





The esteemed "Dinosaur Lady" Elseby van Solms, of Lady Grey, showing Jonah Choiniere and Roger Benson her collection.



Roger Benson and Jonah Choiniere debating the identity of a scrappy fossil they collected.



Only mad dogs and Englishmen (in this case, Roger Benson) go out in the noonday sun.



First year of sitework at the Roussouw bonebed finished. From left: Blair McPhee, Kimi Chapelle, Jonah Choiniere, and Roger Benson.





The beautiful bend in the Saffier River near Lady Grey.

The British invasion wasn't over when Roger left. Hot on his heels was **Prof. Paul Barrett**, Curator of Dinosaurs (and many other things) at the Natural History Museum, London. Paul, his PhD students **Matt Baron** and **Simon Wills**, my students Blair, Kimi, and **Kathleen Dollman**, and the ESI's new honours student **David Groenewald** spent two weeks excavating an amazing ornithischian bonebed near Clarens and prospecting near Paul Roux. Special thanks are in order for **Leon de Villiers** and **Dirkie Luys**, who kindly arranged local contacts and let us stay in a magnificent farmhouse.



From left: Kathleen Dollman, Kimi Chapelle, Simon Wills, David Groenewald, Paul Barrett, Matt Baron, and Jonah Choiniere at their ornithischian bonebed near Clarens (originally discovered by Gideon Groenewald).



One of the many fragments of ornithischian skull discovered in the bonebed.



Mapping the bonebed. From left: Matt Baron, Jonah Choiniere, Kimi Chapelle, Simon Wills, Paul Barrett, Kathleen Dollman.



Several dwarf blindsnakes were hiding in the talus pile.

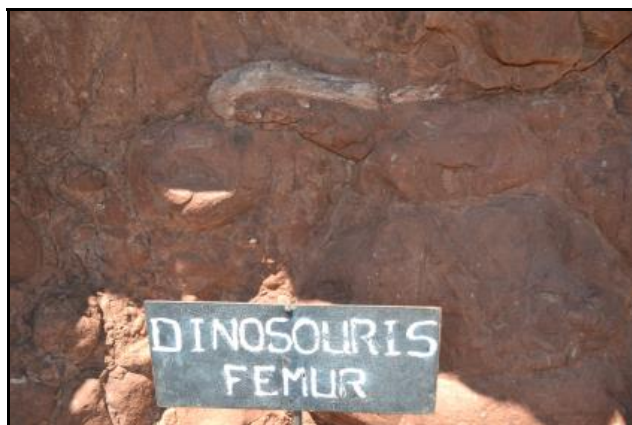


Jacketing specimens can be frustrating work! From left: David Groenewald, Matt Barron, Jonah Choiniere, Kimi Chapelle.



Operation "Mansleigh", a covert operation for removing two 100kg+ jackets from the ornithischian bonebed site. Drill sergeant: Kathleen Dollman.





Seen near Clarens, Free State.



Kathleen Dollman puts her hand in a beautiful theropod trackway near Clarens.



Kimi Chapelle for scale at the theropod trackway site near Paul Roux.

In November, I attended the Society for Vertebrate Paleontology Annual Meeting in Berlin, Germany, with my students Blair and Kimi. I'm pleased to report they did an impressive job delivering their posters and networking with colleagues. We stuck around in Europe for about 3 weeks around



SVP, collecting data at the Natural History Museum in London, the Palaeontological Museum at the University of Tübingen, the Staatliches Museum für Naturkunde in Stuttgart, and the Humboldt Museum of Natural History in Berlin. It was an amazing trip and we even had time to taste a little of the local beer.



The main hall at the Natural History Museum London.



(left) The proudly Victorian cast-iron architecture at the Oxford Museum of Natural History. (right) Jonah Choiniere next to one of many large walls of ammonites at the University of Tübingen



(left) Blair McPhee taking photographs in the tremendous collections of the Museum fur Naturkunde, Stuttgart. (right) The tallest mounted skeleton in the world - *Giraffatitan brancai* at the Humboldt in Berlin.



Time for a beer!

Once we were back from our European odyssey, we were pleased to welcome Dr. Ronan Allain and his student Claire Peyre de Fabregues from the Museum National d'Histoire Naturelle in Paris. They were investigating the anatomy of a new sauropodomorph dinosaur they collected in Lesotho.



(left) Ronan Allain and (right) Clair de Fabregues.

Finally, please take a chance to check out my new and improved lab website here: <https://jonahchoiniere.weebly.com>.

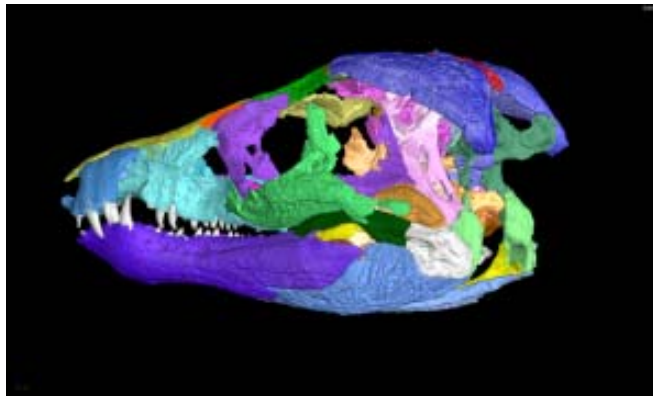
#### Student news:

**Blair McPhee's** paper on a new species of *Eucnemesaurus* has been accepted at the Journal of Vertebrate Paleontology, and he will soon be submitting a paper on another new species of sauropodomorph from Heelbo. He presented preliminary work on the Highland Giant, the Selby Vorster dinosaur, and the new Heelbo creature at SVP 2015. Blair is continuing his work on the



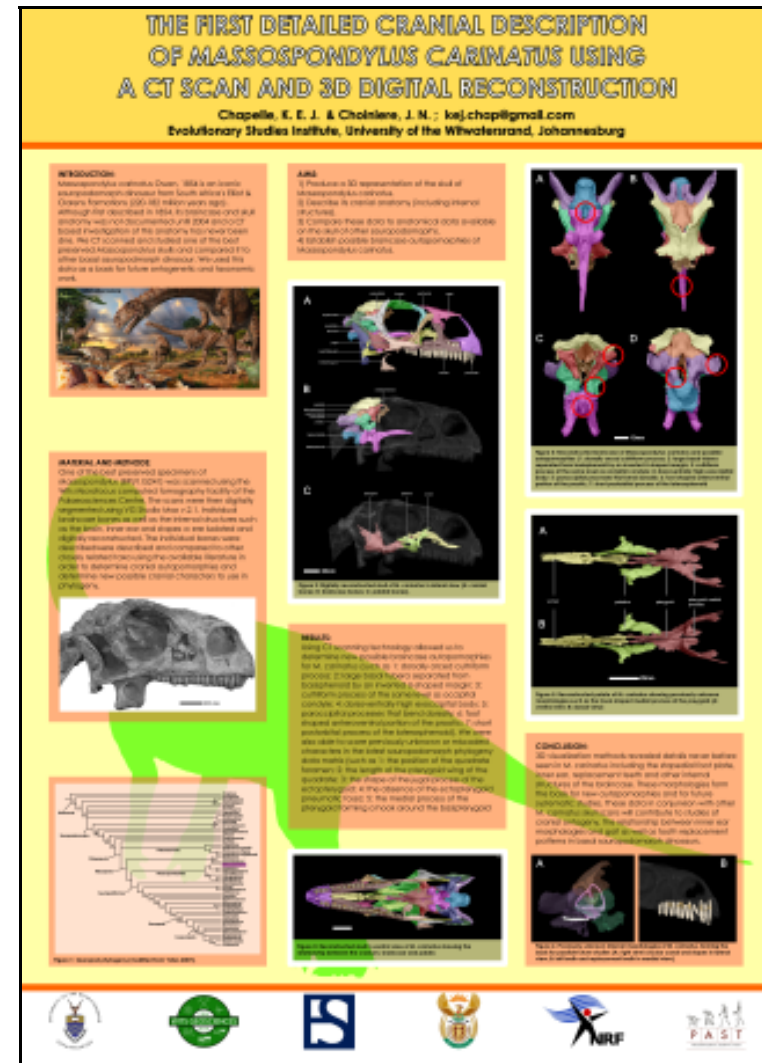
sauropod fauna of the Early Cretaceous Kirkwood Formation with Billy de Klerk.

**Kathleen Dollman** has made incredible progress on the digital reconstruction of the skull of *Protosuchus haughtoni* and she'll be soon submitting this as a paper together with our collaborator Dr. James M. Clark of the George Washington University.



Kathleen's latest work on *Protosuchus haughtoni*.

**Kimi Chapelle** presented her work on the braincase of *Massospondylus carinatus* to great acclaim at SVP 2015 and is working on submitting the manuscript. Her grant to scan the embryos of *Massospondylus* was accepted at the European Synchrotron Radiation Facility and she'll be going there on an all-expenses paid trip in June (and I get to tag along!).



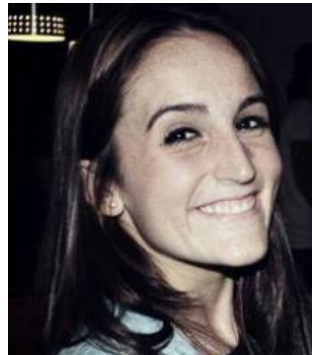
Kimi Chapelle's SVP poster.



A very special welcome to **Casey Staunton**, who completed a great Honours project investigating shape change in the humerus of *Massospondylus carinatus* during ontogeny and will be joining the lab as an MSc student to investigate macroevolutionary shape change in basal sauropodomorpha!



(left) Casey Staunton, new MSc student in the Choiniere lab.

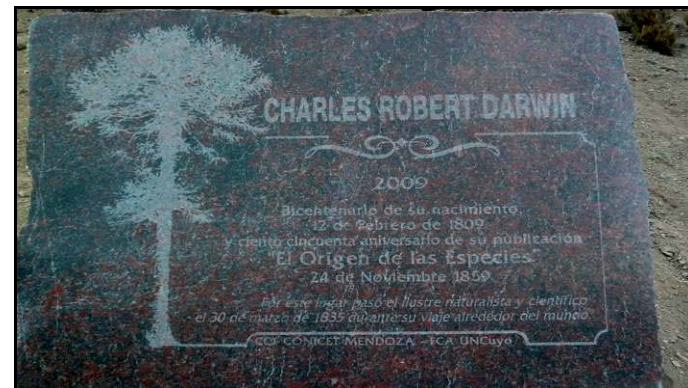


(right) Nadia Afonso, new honours student in the Choiniere lab.

And last but not least, a special welcome also to **Nadia Afonso**, my new Honours student who will be investigating a potential cynodont burrow from the Cynognathus subzone C along with me, **Fernando Abdala**, and **Richard J. Butler** of the University of Birmingham, UK.

## Mike Day – ESI Wits University

As is usually the case, the latter half of 2014 offered opportunities to escape from Johannesburg, and not just to the more salubrious air of the Karoo. In early September I was fortunate enough to accompany Pia Viglietti and Marc van den Brandt to the Gariep Dam area but most of September was consumed by preparations for the 4<sup>th</sup> International Palaeontological Congress in Mendoza, Argentina. This conference boasted a strong South African delegation and a many a familiar face from elsewhere in the world, including the erstwhile ESI postdoc Vincent Fernandez. This of course permitted some travels up the valley of the Rio Mendoza and Rio de las Cuevas, following in the footsteps of Charles Darwin during his Andes expedition of 1835.



A monument commemorating the passage of Charles Darwin on a lonely road near Uspallata, northwest of Mendoza, Argentina.



Mt Aconcagua, the tallest mountain outside of Asia.

Late in October I undertook a 12 day fieldtrip to the Eastern Cape around Jansenville and Waterford along with Bruce Rubidge, Sifelani Jirah and Cynthia Kemp (ESI); later we were joined by Francisco Paiva and Sanda Spelman from UCT and even received a flying visit from Emese Bordy (UCT) and Rose Prevec (Albany Museum) on their return from Lootsberg.



(Left to right) Sifelani Jirah, Cynthia Kemp and Bruce Rubidge record a partial temnospondyl skull at Waterford on the Sundays River in November 2014.

The outcrop was good and the eyes searching it well-practiced but only Sifelani found anything of consequence, teaching me that the Eastern Cape is far more reluctant to part with its Middle Permian fossils. However, the geological work was more fruitful and we managed to collect several samples for palynomorph analysis, which are now in the hands of Natasha Barbolini (ESI). Now I am attempting to spend more time writing, although at this very moment am preparing for Bruce's annual fieldtrip, this time to the *Pristerognathus* Assemblage Zone near Fraserburg. This year we have the pleasure of introducing the new ESI postdoc Julien Benoit to Karoo fieldwork. I'm looking forward to plenty of fossils.

**Cheers, Mike**



The main team minus Cynthia Kemp: (L- R) Francisco Paiva, Sanda Spelman, Bruce Rubidge, Sifelani Jirah and Mike Day outside the bushcamp on the farm Bulrivier.



Mike Day explaining something of great geological significance to Emese Bordy, Francisco Paiva and Sifelani Jirah at the farm Tannies, near Waterford.

### Natasha Barbolini – ESI, Wits University

The 4th International Palaeontological Congress, The history of life: A view from the Southern Hemisphere was held in Mendoza, Argentina from September 28 - October 3. Natasha Barbolini presented a poster entitled "Floral provincialism hinders correlations of Permian palynological assemblages across Gondwana". Ashley Kruger chaired his session as well as presenting a talk on the ontogeny and cranial morphology of the basal carnivorous dinocephalian, *Anteosaurus magnificus* from the South African Karoo. Both attended the mid-congress field trip "A Triassic History of the Cuyana Basin: Geology, Fossils, Fuels and Wine" where a good time was had hiking up spectacular mountain vistas, searching for fossils, and of course, drinking wine!



Ashley Kruger as chair at IPC.





Natasha against the beautiful backdrop of Potrerillos Dam, flanked by the Triassic Precordillera mountain range.



A mural honouring Charles Darwin's visit to Mendoza in 1835.



Wine tasting on the field trip along with Vivi Vadja, Steve McLoughlin and Eric Roberts.

Cheers, Natasha

#### **Pia Viglietti - ESI, Wits University**

I have been involved in a number of fieldtrips since beginning my doctorate at the ESI under the supervision of Bruce Rubidge and Roger Smith. My main focus is the sedimentology and palaeontology of a sandstone unit tucked within the upper Balfour Formation known as the Barberskrans Member. This unit lies in close proximity to the overlying Katberg Formation, and as a result has received the attention of a number of notable palaeontologists and geologists in the past, such as Johnson (1976), Tordiffe (1978), Visser & Dukas (1979), and Cole

& Wipplinger (2001). Also the Barberskrans Members central position within the *Dicynodon* Assemblage Zone means that it may be a useful marker horizon in refining the stratigraphic detail of this very large biozone. In the last 2 years I have accrued some intriguing results that will be published in time for the submission of my thesis in January 2016. I am now in my final year and the writing up begins, so now I would like to share some of my experiences conducting fieldwork for my PhD. Following the Barberskrans Member around the Karoo Basin lead me to some very beautiful and hidden places, along with meeting some of the very interesting people who live there. If you would like to read more about my adventures I also have a tumblr blog showing videos and photos from my fieldtrips:

<http://karoo-kid.tumblr.com/>

### **Nieu Bethesda**

Nieu Bethesda is known by most for Helen Martins and the Owl House - her "Road to Mecca". But the town is also a mecca for palaeontologists as many notable palaeontologists either visited the town (Robert Broom) or grew up there (James Kitching, Sidney and Bruce Rubidge). My first trip there was a solo mission (I was later joined by a student of Lee Burger's, Rachel Anderson) but I had a very enjoyable stay on the farm Onverwags with Sunet and Kosie Wolfaardt where I was treated to visits to the Pub and the famous Saturday night tennis club braais. On a later visit I was accompanied by Roger Smith and some loyal volunteers (Mike Strong, Derik Wolvaardt, and Ian Woods). Here the Barberskrans outcrops on the very

top of Platberg as a 60 m thick unit but varies between 60 and 70 m throughout the study area and most visible of three farms where I conducted the bulk of the field work (Doornplaats, Krugerskraal, and Ripplemead) (Figure: 1).



**Figure 1:** (A) Nieu Bethesda with the picturesque Kompasberg in the background. (B) The Brewery across the Gats River is one of my favourite stopovers. (C) The Barberskrans Member outcrops halfway up Ribbekop on Krugerskraal farm northwest of Nieu Bethesda. (D) The Barberskrans Member caps Platberg at Doornplaats on the Murraysburg Road north of Graaff-Reinet. (E) Photos of fossil hunting legends among fossils at the impressive fossil museum at Wellwood Farm. (F) A fearsome reconstruction arrives at the Kitching Fossil Centre with Billy De Klerk from the Albany Museum during my first field trip to Nieu Bethesda in 2013. (G) I took a day off from the fieldwork to visit the famous Owl House, one of the main tourist attractions of the town.

### **Cradock/Baviaans River Valley**

The Cradock area is where the Barberskrans Member was first documented and named by Tordiffe (1978) during his doctoral work in the area. The type locality of the Barberskrans is beside the abandoned section of the N10 highway overlooking the agricultural centre of Mortimer. Here the Barberskrans has been traced as far east as Seymour and reaches its maximum thickness (90 m). However I needed to find good outcrop for fossil collecting in close association with the Barberskrans Member and this lead me into the Baviaans River Valley near Bedford. Here I stayed at the beautiful homestead of Eildon Farm with Alex, Barrie, David, and Taryn Pringle. They welcomed me into their beautiful home on two occasions when I was accompanied by PhD student Cameron Penn-Clarke and Honours student Marc Van Den Brandt respectively. Notable



fossil finds included a large concentration of fish fossils on Eildon - an apparent mass mortality, and also large *Daptocephalus* skulls from Lower Clifton and Craig Rennie farms. A highly enjoyed digression from the fieldwork was a visit to Ernest and Ann Pringle at Huntly Glen where Ernest has amassed the largest amateur butterfly collection in the southern hemisphere. He also has the largest amateur bird egg collection which was collected by his late father, Victor Pringle. Our work in the Baviaans River Valley also piqued the attention of the Bedford newsletter which Marc and I featured in (Fig 2).

**Figure 2:** (A) The stately homestead of Eildon. (B) **Ernest Pringle** enjoys a chuckle while showing us his impressive butterfly collection. (C) Here I am pictured holding a large and weathered *Daptocephalus* skull found on **Craig Rennie** farm. (D) **Marc** shows off our fossil fish supper on Eildon. (E) Marc and I featured in the recent Bedord News bulletin.



### Gariep Dam

The Gariep Dam area was of interest mainly due to the presence of prominent sandstone below the Katberg Formation and due to observations by Kitching (1977) that this part of the stratigraphy was "highly attenuated". I worked mainly on three farms (Inhoek, Van Wyks Fontein, and Schalkwykskraal). At this site I discovered that not only that the Barberskrans Member is present but that it has thinned significantly along with the rest of the stratigraphy. It is also the last major outcrop of this unit and it could only be traced as far north as Springfontein, some 40 km further north. It was also at this site that it first became apparent of a stratigraphic separation between *Dicynodon* and *Daptocephalus*, and *Therapsid* and *Moschorhinus* below and above the Barberskrans Member respectively. I was accompanied by Dr. Mike Day and honours student Marc Van Den Brandt to this field area and their help was much appreciated in the search for fossils. Their company was also appreciated one evening we got stuck while leaving Inhoek. Luckily the farmer (Marcel Mellet) kindly extricated us from our predicament and invited us to a braai and beer at his farmhouse after our ordeal (Fig 3).

**Figure 3:** (A) Mike Day (left) and Marc Van Den Brandt (right) excavate a fossil on Van Wyks Fontein. (B) Gariep Dam and the Resort hill from the vantage point of Inhoek Farm. (C) Mike and Marc looking dejected after our vehicle became mired; mostly because there were no beers in the cooler. (D) For Mike, the long wait for the farmer to save us almost became too much. (E) Mike and Marc conduct some late night "surgery" on a *Daptocephalus* skull. (F) Proof Palaeontologists do take the time to stop and smell the flowers on occasion.



Other sites I visited included Tafelkop near Bloemfontein, Boomplaas Hill near Jagersfontein, Leeukloof near Beaufort West, and Javanerskop on Oukloof Pass south of Fraserburg. All of these sites have proven to not have the Barberskrans Member present. I am currently awaiting results of detrital zircon dates from Barberskrans sandstones samples collected field sites where the member is present. I am optimistic the zircons will yield some interesting results that will further characterize the Barberskrans Member. They are being processed at the Central Analytical Facility at Stellenbosch University by Dirk Frei and his colleagues.

One last fieldtrip, writing up the PhD, and attendance at the SVP conference in Dallas Texas later this year mean 2015 is going to be a busy year for me - wish me luck!

### **Alexander H Parkinson – ESI, Wits University**

Thanks to funding obtained from National Research Foundation, University of the Witwatersrand, as well as the DST Centre of Excellence in Palaeosciences I was fortunate to be able to attend two very prestigious conferences in Argentina during 2014. The 12<sup>th</sup> International Conference of Archaeozoology (ICAZ) was held in the beautifully quaint city of San Rafael in the Mendoza Province, nestled at the foot of the Andes Mountains. The organization and facilities were outstanding, and the conference a great success. I gave both a poster and oral presentation during the taphonomy session. My

research was extremely well received and generated substantial discussion. On the last day of the conference the International Taphonomic Working Group held its biannual meeting, and I was approached with regards to hosting the Next Taphonomic Working Group meeting in 2016 or 2017 in South Africa. Furthermore, I proposed the establishment of a Global Weathering Project which has subsequently generated substantial international interest. Our aims are to establish a fixed experimental protocol and conduct broad scale weathering experiments in as many geographically dispersed localities as possible. Currently, we have members from Argentina, USA, England, South Africa and India who shall be facilitating this global endeavour. Most prestigiously Dr Kay Behrensmeyers has agreed to contribute her years of experience in guiding our efforts-watch this space.

The International Palaeontological Congress was held a mere 150km away in the provincial capital of Mendoza City. The conference was fantastic and I listened to more interesting talks than I could ever have imagined. Once again, I gave an oral presentation in the taphonomy session. I must admit it is quite overwhelming being in the same space as so many world class palaeontologists. You soon realise that you are still a fledgling trying to find your own wings. One of the highlights was the amazing palaeo-art exhibition!

Conferences aside, Argentina and particularly Mendoza province, must be one of the most beautiful places in the world. I met so many new people, made so many new friends,



established many collaborations and had an absolutely blast of a time. The beer was great, the coffee even better, and someday soon I hope to return to Mendoza Plaza to eat just one more Lomo (Meat Sandwich) and have one last slice of morning toast with Dulce de Leche (another regional culinary delight). What a fantastic country, fantastic people, fantastic food, and an altogether fantastic experience.



(left) The famous bridge at the base of the Andes Mountains. (right) A view of the entrance of Canyon de Atuel



(left) Snow-capped Andes Mountains. (right) Freezing to death at the base of Aconcagua 5572m above sea level! **All the best - Alex**

## **Rose Prevec - Albany Museum, Grahamstown.**

The Earth Science Department has been steadily ticking over, with fieldwork having dominated our activities in the last part of 2014. Many thanks are due to the Centre of Excellence in Palaeosciences, who funded several projects last year, including two productive fieldtrips to the Lootsberg and Wapadsberg Pass areas near Nieu Bethesda, and a trip to Argentina. Work on the Permian Triassic boundary in the Wapadsberg Pass area continues, although the project is now reaching the final stages from my side. The discovery of a fantastic new plant fossil locality close to the Balfour/Katberg boundary near the Wapadsberg Pass was further confirmation that the Permian- Triassic extinction event is probably better described as a transition, at least as far as the plants are concerned.

My three weeks in Argentina was an unforgettable experience that served to foster relations with palaeobotanists at the Argentinian Museum of Natural History (Museo Argentino de Ciencias Naturales "B. Rivadavia") in Buenos Aires. At the invitation of fellow *Glossopteris* researcher, **Dr Bárbara Caraglino**, we set off on a two week fieldtrip to collect material from the La Golondrina Formation, in the Santa Cruz Province in Patagonia.



Rose Prevec and Barbara Caraglino, two members of a rare breed of palaeobotanist prepared to tackle *Glossopteris* taxonomy.

The 2000 km drive from BA down into stark and beautiful Patagonia was surely the furthest I have driven in one stretch to get to a field site. The Permian outcrops in the field area, about 130 km north of Puerto San Julian, were situated on huge sprawling Estancias - sheep ranches that make our Karoo farms seem verdant. Apart from sheep eking out an existence on the low scrubby vegetation, small herds of guanacos (camelloids similar to llamas) were ubiquitous, as well as rheas (small endemic ostriches) and the occasional scuttling armadillo,

lizards and pungent stick-insects called chinche molle, that made their presence known by releasing a strong herby smell when disturbed. There was plenty of birdlife, including large flocks of flamingos looking incongruous in the ephemeral 'lagunas' dotted across the almost lunar landscape.

We found a number of *Plumsteadia*-like fructifications, as well as *Arberia* and the first Argentinian specimen of what may be *Gonophylloides* preserved in attachment to a *Glossopteris* leaf. We also found several examples of *Sphenophyllum speciosum* with attached cones, a fortuitous discovery considering colleagues and I are currently describing the first cones of this species to be found in the world, from the Wapadsberg Pass area.





We spent the bulk of our time excavating a rich plant locality on the edge of Laguna Pollina, a site first studied by renowned Argentinian palaeobotanist Prof. Sergio Archangelsky. There was shallow water in the ephemeral lagunas, and these were frequented by flocks of companionable flamingos.

Upon our return to BA, I spent a week looking at collections and making comparisons with South African floras, and look forward to a long and productive collaboration with my wonderful new Argentinian colleagues.



Beautiful *Sphenophyllum speciosum* specimen from Laguna Castilliano.



The goggles we wore, to keep out the stinging sand and dust whipped up by the ferocious Patagonian wind, were particularly flattering.





Our accommodation for the first week of fieldwork: sheer luxury for die-hard palaeontologist-campers, although this little house had no functional plumbing and bushes were scarce.....

**Billy de Klerk** has been preparing for his much-anticipated retirement from the Earth Science Department at the end of March this year. Although Billy is understandably looking forward to his freedom, the staff of the Albany Museum will rue the day. We fully intend to entice him into a long and productive second-career as an emeritus curator. Don't leave us, Billy!!

We said goodbye at the end of the year to **Luvuyo Mayi**, our enthusiastic technician who has been an integral part of our Department for over six years. Luvuyo contributed greatly in terms of his collecting and preparation skills during this time, as well as his excellent interaction with the many school groups

that have visited the department. We wish him all the best in his new post as manager of the Uitenhage Railway Museum.

**Till next time.... Rose**

oOo

### **John Anderson – Pretoria**

Honorary Research Associate (Palaeobotany), ESI, Wits.

Of '*Molteno horsetails*' & '*Africa Alive Corridors*'

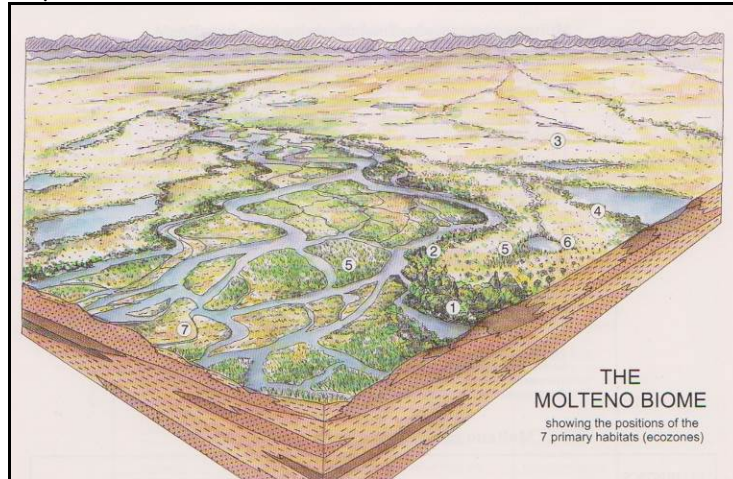
The past six months were divided pretty evenly between these two projects.

**'Molteno horsetails'** (Heidi & John Anderson)

Heidi was out from Australia for 3 months (9 July–7 Oct), partly in Europe, helping complete our book on the diversity of sphenophytes from the Molteno. Jonah Choiniere, Evolutionary Research Institute (where the Molteno collection is now housed, and who will be publishing the volume), guided it through the referee process. The referees edits and queries must still be incorporated before going to press. We thank Jonah warmly for his efforts: squeezed into a very tight year of his own.

**Torsten Wappler** (from Bonn) and **Olivier Bethoux** (from Paris) were here—at ESI, Wits—for 3 weeks (2–24 Oct), starting their comprehensive taxonomic study of the Molteno insect fauna. Conrad Labandeira (Smithsonian, Washington), continues his study of the Molteno plant-insect interactions. By 2020, a good round figure, we hope to have all aspects of the flora, fauna and ecology of the Molteno published - entailing a

few more volumes. A very special window onto the Late Triassic world will then be wide open; letting in a vista of remarkable diversity.



*'Africa Alive Corridors'* (eds John Anderson & Maarten de Wit) And here my time was divided further between two books, *'Africa Alive Corridors'* and *'The Homo sapiens Corridor'*. The first a geological-biological-cultural biography of the continent told along 20 heritage corridors; the second, Corridor 10, telling our 200,000-year *Homo sapiens* story along the southern Cape coastal region. The aim is that these two multi-contributor books be completed by end 2015 and published through Springer Verlag in early 2016.

Many colleagues have contributed through the past 6 months. We mention just a few. **Colin Garland**, was out from

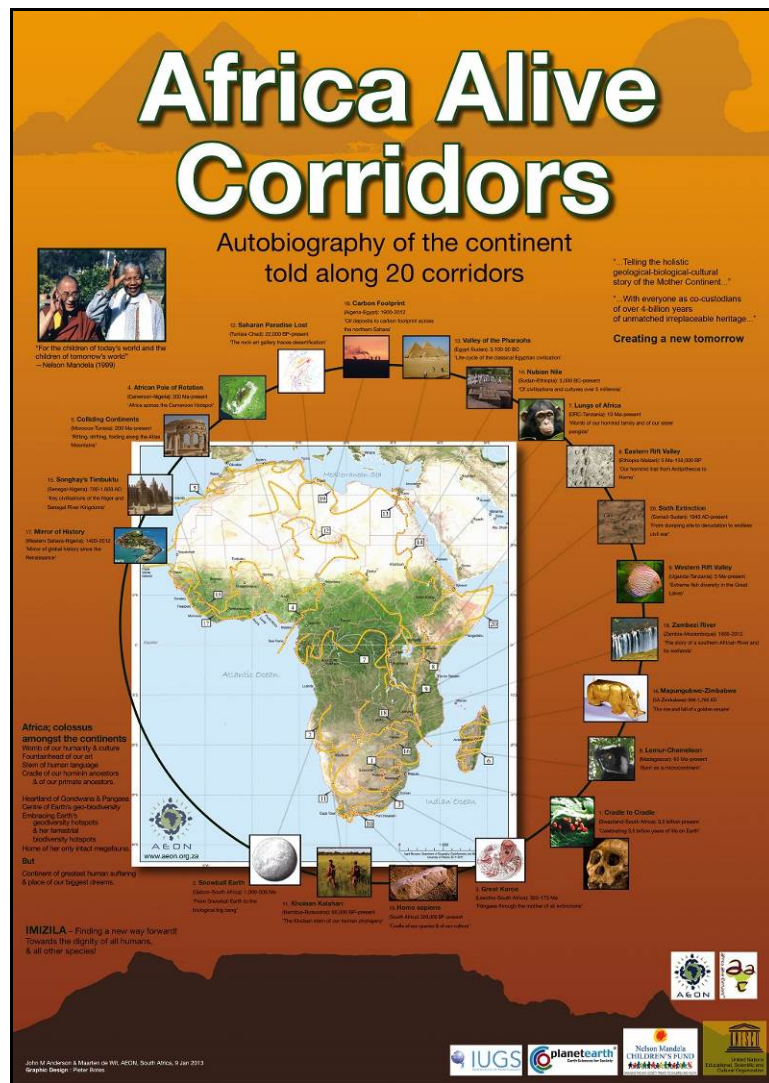
Massachusetts running his *'Global Classroom'*, and using our place as base camp (early May to mid Oct) for studying Big Cats in the Kruger Park and wild dogs in Namibia. Emma Jepsen, Apryl Green, and Ricky Holloran (all of the US) and Marie-Therese Heggen (Norway), amongst his students, each spent a couple of weeks or more helping in various ways on the Corridors books. Michele Fournier, with 'Parks Canada' in Quebec, came out for 2 months (mid Nov 2014-mid Jan 2015) as a volunteer. Her aim is to help us get our *'Africa Alive Corridors'*--with the linked *'Gondwana Alive'* and *'Earth Alive'* projects--going global over the coming years. We thank her and all the others greatly.

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And the year ended with a walk up Table Mountain: Platteklip Gorge--with my Stellenbosch family, including two grandkids Rick (3 years) and Shae (just turned 1 year). With thousands of others from around the planet - via cable car, walking (the littlest ones being carried) or climbing—we made our way up the iconic TM. Rick talked the whole way up and Shae laughed. It was nice and symbolic; the future is theirs, and our AAC projects aim at that future being a bright one!

**Cheers - John**

oOo



**Heidi Holmes - Dorrington, NSW, Australia**  
Honorary Research Associate (Palaeobotany), ESI, Wits  
(46 Kurrajong St. Dorrington, NSW. Australia 2453)

Keith and I attended a palaeobotany conference and field trip in Italy in August last year. Below is a short account of our trip with a few photos. If anybody would like more information then I have written up the Field trip to the Dolomites in the same format (some 30 pages) and can send PDF copies.

It has been a special year with me reaching the young age of 70 years and being fortunate to still pursue palaeobotany!

**HAPPY 70<sup>th</sup> BIRTHDAY HEIDI (ed)**

### 9th EPPC Padua 2014

The 9th European Palaeobotany-Palynology Conference EPPC was held in Padua, Italy 26-31 August 2014. The meeting was held in a brand new building of the Uni. Botanic Gardens dating from 1545 (UNESCO WH site). The opening ceremony was in the Aula Magna of Palazzo del Bo of the Historic Padua University (Galileo lectured there!). Some 500 participants attended.





(left) Behind is the famous Basilica of San Antonio. The lectures were held in a very modern building – Dep. of Geosciences. (right) **Keith Holmes** from Australia and **Heidi Anderson-Holmes** from South Africa chat to Prof. **Krassilov** (ex Russia now Israel)!



The Museum of Geology and Palaeontology is world famous for the historic **Palm Room** where some almost complete Eocene fossils are displayed.



Other rooms house the amazing **Eocene fishes** and other fossils that all derive from the **Monte Bolca** localities NW of Padua. Go on the web for more information on places mentioned.



(right) This was one of many imposing churches that we passed on the way to Monte Bolca (in the hills beyond). The bus skirted Verona on the way into the Lessini Mts (part of the southern alps in Italy). (left) On the mid congress field trip there was an option to visit one of the collecting spots – an underground adit from where many fish fossils have been mined over 300 years. The earliest published record is from 1550!

#### 9th EPPC Dolomites 2014



(left) Heidi and Keith joined the field trip into the Dolomites centred around the town of **Bolzano** where our palaeobotany leader Dr. **Evelyn Kustatscher** is stationed. (right) The second day was spent in the **Geoparc Bletterbach** (part of UNESCO WH) which is a deep canyon with good exposures of red Permian strata (many **Parieasa** tracks) and Triassic rocks.



(right) On the third day we took two cableways from **St. Ulrich** to **Seceda** where we had spectacular views, learnt about the complex geology which included extensive outcrops of Permian & Triassic strata. (right) View from **Seceda** towards the **Geisler/Odle** carbonate platform of the Dolomites (luckily the clouds lifted). In winter the foreground is a popular ski slope.



(left) We drove over the pass **Grödner Joch/Passo Gardena** with a geology talk on the way looking up at the impressive **Sella** massif on our way to sleep at **Corvara**. There we enjoyed a typical Tyrolean dinner and slept in a chalet hotel with beautiful wood carvings. (right) The last day we collected Triassic (Carnian) amber from the Heiligkreuz section above the **Rifugio Dibona** (Mt Hut below). Alongside us was the renowned climbing area with sheer cliffs and

Peak **Tofana** 3243m. The grande finale was visiting the **Rinaldo Zardini** Museum in **Cortina** and seeing the incredible marine fossils this amateur collected from the Dolomites.

oOo

**Steve Tolan - Chipembele, Zambia** [www.chipembele.org](http://www.chipembele.org)

Fossil Expedition - June 2014

This was the 4th expedition to Zambia carried out by the same core team, the others being in 2009, 2011 and 2012. This year's expedition was funded by a grant from America's National Science Foundation and was, without doubt, one of the best we have ever carried out. That is partly due to the fact that we had a really big team of 8 experts (most from America, but also from South Africa and France), plus, Adam, a friend from Lusaka, Joseph from Zambia's National Heritage Conservation Commission and myself. Most of the experts have incredible fossil-finding skills, which helped boost our collection total. We also had a chef and an assistant, who were necessary to prepare the food required for our team of 13. It was the longest expedition we'd ever starting Lusaka in late June followed by our fieldwork in the mid-Zambezi Valley, near Lake Kariba. The main fossil site is the earliest we know of in Zambia for tetrapod fossils. It is Mid Permian, c. 270 million years old, which is a rare era worldwide for vertebrate fossils. We discovered a new site in the area in 2012, and only one Mid-Permian **Burnetiid** skull had ever been found in the world up to

then, but we found **three** in just a few hours that also represented two different species!

On this year's trip, we found a further **seven** burnetiid skulls at the main site, with two more just a few km away. In addition, we also found many fossils of different types of carnivorous and herbivorous dinocephalians (including titanosuchids, tapinocephalids and anteosaurids), a lot of unusual dicynodont material from all our sites including several new species, much temnospondyl material (crocodile-like amphibians), including 2 large, complete skulls (the first ever found in the Permian in Zambia), and many other fossils besides. Most of the fossils we found were of therapsids, which were reptilian-like but ancestral to the mammals.

After a few days in the first area, we drove a long way east and found another burnetiid skull within a couple of hours of setting up camp, plus some unusual fossil wood. On the next day, we found an area with good vertebrate fossils, but also some exceptional fossil wood, some showing that the trees here had been huge during the Permian, whilst other pieces showed evidence of insect infestation. In the same area, we also found several large fossil fern bases, the first time they have ever been found in Zambia. One of the experts on our trip was a palynologist and she took many samples from the fossil sediments, so that the fossil pollen they contain can be identified. She was also interested in fossil trees and plants, and collected many examples, which were taken back to South Africa for study. On the last morning, we collected yet another

burnetiid skull, our **11th** of the trip thus far.

After 12 days of fieldwork, we returned to Lusaka. After replenishing our food supplies, we drove north from Lusaka, spending the night amongst the spectacular scenery of Mutinondo Wilderness ([www.mutinondozambia.com/main\\_frame.htm](http://www.mutinondozambia.com/main_frame.htm)), before crossing North Luangwa National Park and then fording the Luangwa River by pontoon before heading north to the remote upper Luangwa Valley.

Here in the Mid Triassic deposits, c. 235 million years old, we found many fossils, including those of archosaurs, silesaurs, shuvosaurs, dinosauriformes, cynodonts, temnospondyls, plus fossil shark spines, lungfish and fish teeth, etc.. I wanted to visit some remote sites that lay far from camp, so I walked there and back over 2 days, a 42km walk in total. I slept under a mosquito net, with a small fire to ward off animals. At the farthest point I reached, I discovered Early Man sites full of hand-axes and flaked tools, looking as fresh as though they had been made yesterday, though they are about 300,000 years old. I hope to return with an archaeologist to study the sites in the future. Close to this area I saw some wild animals, including kudu, and nearby I found 2 poachers' camps built next to a permanent waterhole. One camp had a large kudu skull and horns hanging from a tree.

We then returned to North Luangwa National Park where we found in Late Permian sites, two more burnetiids (making **thirteen** in total), many dicynodont fossils, several gorgonopsian



skulls, several pareiasaurs and other assorted fossils of various different creatures. In 2011 we may have found the largest ever femur of a gorgonopsian, a sabre-toothed killer of the Permian, and on this trip we may have found the largest canine ever of the same type of creature. We had been given special permission to search inside the rhino enclosure, where there are around 30 Black Rhinos, and it was exciting to find fresh rhino footprints right where we were collecting fossils. In a Triassic area of the park that we visited, we found amphibian, dicynodont and archosaur fossils, the first Triassic fossils we have found in NLNP.

At all the sites, in addition to the samples of sediments taken for pollen testing, 150+ further samples were taken to allow geo-chemical testing, in an effort to accurately date the age of the rocks, and hence the fossils we were finding.

The expedition this year was exceptional, both in terms of the numbers and rarity of the fossils we collected, and the sheer variety of animals and plants they represent. There is already no doubt that there are some new species and genera in the hoard, and after preparation, I am sure that there will be even more identified.

Over 5,000 photographs and video clips were taken by the team during the expedition and it has been a difficult choice to whittle them down to a manageable number. Here are just a fraction.



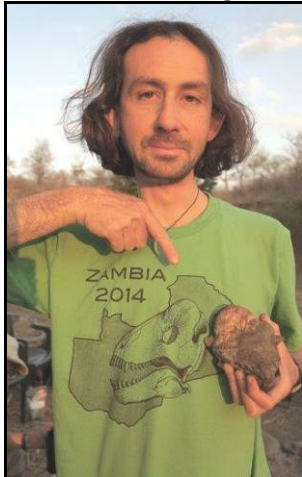
Sorting out just some of the mountain of food for the expedition whilst still in Lusaka



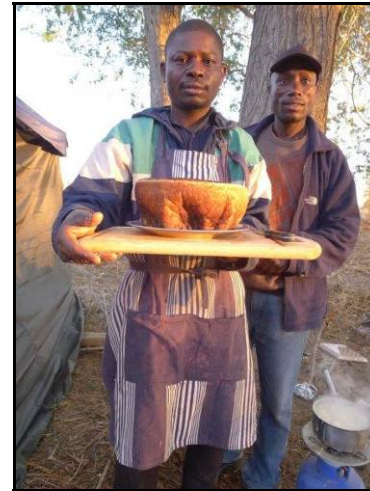
Cataloguing some of the fossils that had been collected at the first site.



Uncovering the skeleton of a titanosuchid dinocephalian



(left) Ken, wearing the exclusive 2014 expedition T-shirt featuring the skull of a dinocephalian, whilst holding a part of an eye orbit of one of these massive creatures. (right) The biggest dinocephalian tooth found so far - total 50+ in collection.



(left) Zacs and Chanda with bread cooked in an iron pot.  
(right) Chris and Seb work on the complete skull of large Permian amphibian, the first ever found in Zambia





Amazingly, the second ever complete skull was found 4 metres from the first, and also collected

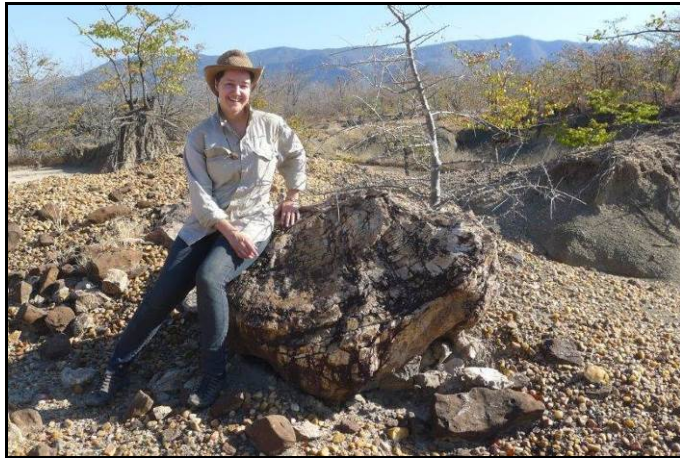


The team (minus Steve - photographer) near Lake Kariba.



The site of 'msungus' collecting water from the village pump attracts lots of children

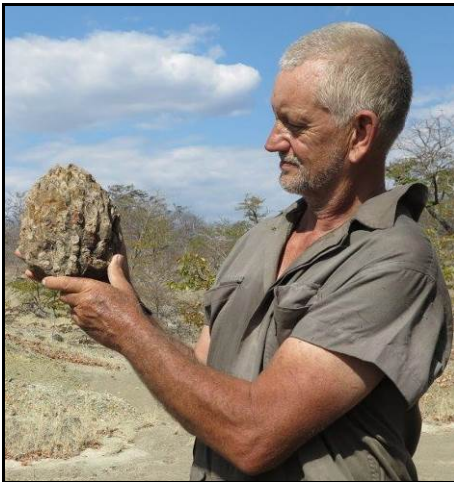




Natasha sitting on a huge piece of fossil wood. The tree would have been over 2m in diameter.



Mutinondo Wilderness



(left) Steve with a fossil fern stem base



(right) Internal structure of my fern stem base



An expedition vehicle fords a shallow river





Crossing the Luangwa River by pontoon from North Luangwa Nat. Park



Setting up camp in a remote village is guaranteed to draw the crowds!



Discussing the day's finds, and planning the next day's walks



(left) Game Scout studies a fossil skull in the riverbed. (right) Plastering a dicynodont skull to prevent damage on collection. While digging a second skull was observed underneath and jacketed together.



(left) The toothy grin of a gorgonopsian skull. Note the huge serrated sabre-tooth on the right. (right) A complete gorgonopsian skull with lower jaw. The damage seen can easily be repaired. When it was excavated, it was lying on it's front legs, which were also collected.



Cloudy skies at dusk in the campsite

Best wishes, Steve

Francis Thackeray - EIS at Wits.

# EARLY PLEISTOCENE HOMININ CRANIA FROM DMANISI, GEORGIA IN RELATION TO AFRICAN SPECIMENS ATTRIBUTED TO *H. HABILIS* AND *H. ERECTUS*

J Francis Thackeray and E Odes

Professor JF Thackeray is with the Evolutionary Studies Institute and Eddie Odes is with the School of Anatomical Sciences, University of the Witwatersrand, Johannesburg. francis.thackeray@wits.ac.za

Five hominin crania from Dmanisi in Georgia, dated at 1,77 million years (Lordkipanidze et al. 2007, 2013; Rightmire et al. 2006, 2008) have recently been considered to represent a single species as a regional variant of *Homo erectus* (Lordkipanidze et al, 2013). This view has been criticised by Schwartz et al. (2014). The contrasting views can be re-assessed in the context of a probabilistic definition of a species and morphometric analyses of Early Pleistocene crania (Thackeray 2007; Thackeray & Odes 2013) from Dmanisi and Africa. In particular, we conclude that East African specimens KNM-ER 1813 and KNM-ER 3733 (both dated at 1,65 million years ago) reflect the range of variation that is also represented in five Early Pleistocene crania from Dmanisi.. Thackeray (2007) claims to have recognised an approximation of a biological species constant ( $T = -1,61$ ) based on the log-



transformed standard error of the  $m$ -coefficient ( $\log se_m$ ) in regression analysis of cranial and other data from pairs of specimens of conspecific extant species associated with regression equations of the form  $y = mx + c$  where  $m$  is the slope and  $c$  is the intercept, using measurements of any specimen A (x-axis) and any specimen B of the same species (y-axis). When homologous pairs of cranial measurements of conspecific specimens are compared there is generally little scatter around the regression line. The degree of scatter around a regression line is quantified through the  $\log se_m$  statistic. When comparing a pair of conspecific vertebrates, the  $\log se_m$  statistic shows a central tendency around a mean value of -1,61, calculated from pairs of more than 70 taxa (Thackeray 2007).

These data obtained from modern species can be used to assess probabilities of conspecificity for pairs of fossils. Criticisms have been raised by Gordon and Wood (2013), but it should be noted that their own results from modern primates, including chimpanzees, gorillas, humans, orang-utans and colobus monkeys) are associated with a mean  $\log se_m$  value of *circa* -1,6 for comparisons of conspecific specimens. The approach adopted by Thackeray (2007) is extended and applied here to Early Pleistocene fossils from Dmanisi and East Africa in order to address probabilities of conspecificity and sexual dimorphism.

The slope  $m$  for comparisons of extant conspecific specimens is a function of size, relating in part to sexual dimorphism

(Thackeray et al. 2000) and in part to ontogeny (Thackeray & Kashe-Katiya, 2002). Relative to a reference specimen, large adult males are generally associated with relatively high slopes ( $m > 1$ ). Relative to the same conspecific reference specimen, small adult females are generally associated with relatively low slopes, where  $m < 1$  (Thackeray et al. 2000).

In this instance we compare 23 cranial measurements obtained from the Dmanisi hominins with corresponding measurements for two East African specimens: KNM-ER 1813 (formerly attributed to *H. habilis*) and KNM-ER 3733 (formerly attributed to *H. erectus* or *H. ergaster*). Both East African specimens are dated to circa 1,65 million years BP (Gathogo, PN & Brown, FH 2006; McDougal et al. 2012). Since the five specimens from Dmanisi are not sufficiently complete to allow measurement of all 23 of the cranial dimensions for each specimen, we have calculated the mean values for these variables using previously published measurements (Lordkipanidze et al. 2007, 2013; Rightmire et al. 2006, 2008; Wood, 1991).

In regression analyses of KNM-ER 1813 and the Dmanisi sample, as well as KNM-ER 3733 and the same sample from Dmanisi (where A is on the x-axis and B is on the y-axis, and vice versa), the mean  $\log se_m$  value is -1,5. This is not significantly different from the mean  $\log se_m$  value obtained from pairwise comparisons of modern conspecific pairs for which the mean  $\log se_m$  value is -1,6 +/- 0,2 (Thackeray 2007).

In Fig. 1, the slope for the regression line obtained from a comparison between KNM-ER 1813 (y-axis) and the Dmanisi sample (x-axis) is  $<1$  ( $m = 0,869$ ). The degree of scatter around the regression line is small ( $\log se_m = \text{circa } -1,5$ ), consistent with the view that KNM-ER 1813 is a female of a species also represented by the Dmanisi sample. The slope for the regression line obtained from the comparison between KNM-ER 3733 and Dmanisi samples is  $>1$  ( $m = 1,072$ ) and again the degree of scatter around the regression line is small ( $\log se_m = \text{circa } -1,5$ ), which is consistent with the view that KNM-ER 3733 represents a male of the same species represented at Dmanisi.

### Conclusion

Our morphometric analyses suggest that KNM-ER 1813 is a female and that KNM-ER 3733 is a pene-contemporaneous male of the same species represented at Dmanisi, despite the fact that the two East African specimens have been previously assigned to *H. habilis* or *H. erectus*. Our conclusion is consistent with the view of Van Arsdale and Wolpoff (2013) who suggest that a single species is represented by certain specimens that have previously been attributed to *H. habilis* or *H. erectus* in East Africa and Georgia. Our view is also compatible with the view (Lordkipanidze et al. 2007) that Dmanisi samples of early *Homo* reflect the kind of variability that is expressed in Early Pleistocene African specimens attributed to early *Homo* (attributed to *H. habilis* or *H. erectus*).

### Acknowledgement

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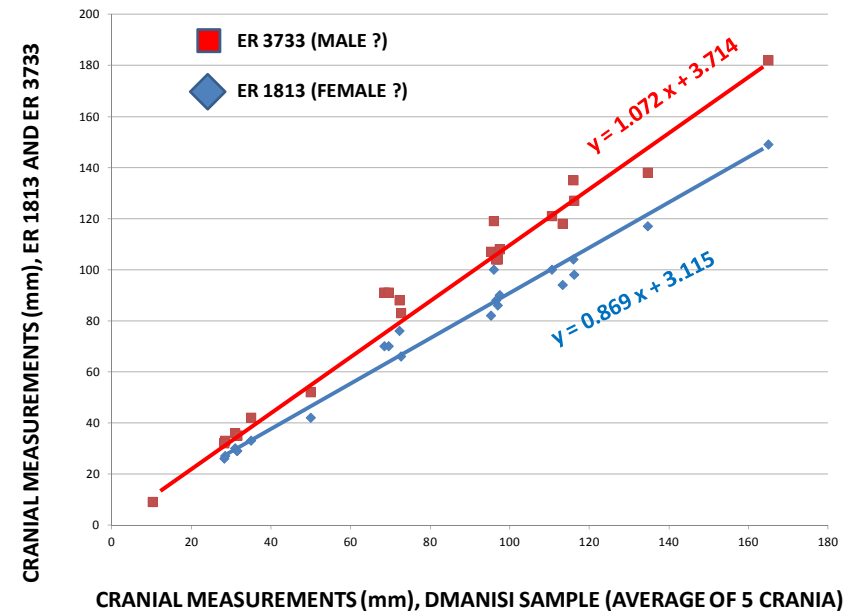
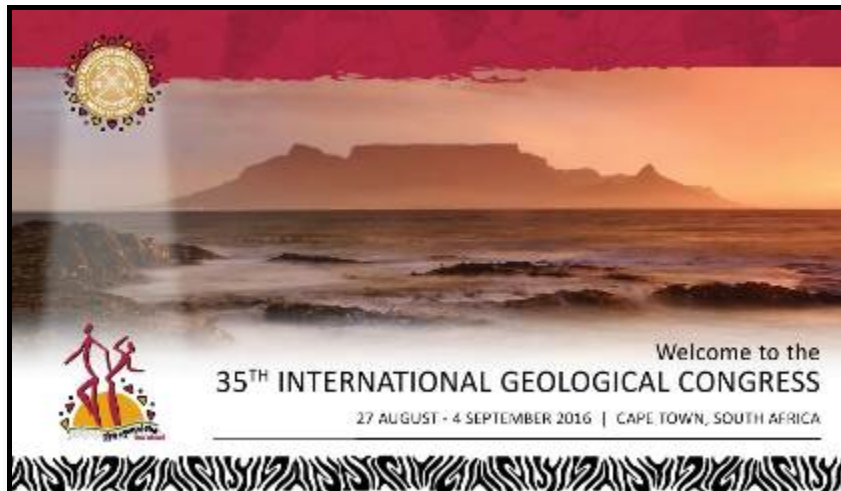


Fig. 1: Cranial measurements (mm) of KNM-ER 1813 (formerly attributed to *H. habilis*) and KNM-ER 3733 (formerly attributed to *H. erectus*), compared to the mean values for corresponding cranial variables in five skulls from Dmanisi in Georgia. In both cases the degree of scatter around the regression lines is small ( $\log se_m$  is circa -1,5) and is associated with a high probability of conspecificity. The difference in slopes suggests that KNM-ER 3733 is probably male, and KNM-ER 1813 is a conspecific female, in accordance with the approach described by Thackeray et al (2000).

Conferences, Palaeo art, recent fossil discoveries & press cuttings.

## 35<sup>TH</sup> INTERNATIONAL GEOLOGICAL CONGRESS

27 AUGUST - 4 SEPTEMBER 2016 | CAPE TOWN, SOUTH AFRICA



More information - [www.35igc.org](http://www.35igc.org)

There will be several sessions on palaeontology at the IGC'16 so please consider presenting some papers of international significance.

## 4<sup>th</sup> International Palaeontological Congress

<http://www.ipc4mendoza2014.org.ar/>

## XVIII International Congress on the Carboniferous and Permian

<http://kpfu.ru/iccp2015>

XVIII International Congress on the Carboniferous and Permian, to be held at the Kazan Federal University, City of Kazan, Russia, August 11 – August 15, 2015.

## 10 Ways You Can Help Stop the Sixth Mass Extinction

[http://www.huffingtonpost.com/anthony-d-barnosky/10-ways-you-can-help-stop\\_b\\_5968774.html](http://www.huffingtonpost.com/anthony-d-barnosky/10-ways-you-can-help-stop_b_5968774.html)

## Palaeontology Art by Gina Viglietti

[ginav.kirona@gmail.com](mailto:ginav.kirona@gmail.com)

Gina, sister of Viglietti, is a digital artist based in Cape Town and she says that she has a not- so- secret love for paleontological and scientific art. She is open for commissions from those in the scientific community seeking the services of an artist. Gina mentioned that she had recently she created a hominid evolutionary diagram for Francis Thackeray, which he has published in one of his papers. Gina is advertising her services as a scientific artist to others in the scientific community. Examples of her work can be seen at:

<http://ginaviglietti.deviantart.com/>



## Extracts from Geological Society of Africa (GSAf) Newsletters - Lopo Vasconcelos

### Fossil treasures at risk in Morocco desert town

2014.11.01. ERFOUD: In the middle of a sprawling palm grove in Morocco's remote eastern desert, inhabitants of an oasis town watch over a rare and vanishing treasure.

At the entrance of a traditional town house visitors are welcomed by a piece of Erfoud's unusual bounty: the petrified skeleton of a prehistoric creature.

This huge ammonite is one of hundreds of archaeological jewels in and around

Ibrahim, a craftsman in his 60s, has spent half his life sculpting fossils, a discipline he says requires "time, dexterity and patience".

"You need to work slowly so you don't damage these pieces, which are often very valuable. Working on just one stone can take up to 20 hours," said Ibrahim.

Away from the artisans and artefacts of Erfoud's museum, several other

[http://www.geologypage.com/2014/11/fossil-treasures-at-risk-in-morocco\\_1.html](http://www.geologypage.com/2014/11/fossil-treasures-at-risk-in-morocco_1.html)



## Madagascar: Fossil skull offers insights into the life habits and relationships of early mammals

2014.11.05

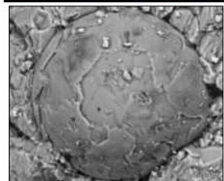
The surprise discovery of the fossilized skull of a 66- to 70-million-year-old, groundhog-like creature on Madagascar has led to new analyses of the lifestyle of the largest known mammal of its time by a team of specialists including biologist Elizabeth Dumont at the University of Massachusetts Amherst, an expert in jaw structure and bite mechanics.

The skull of this animal, named *Vintana sertichi*, was found in a geological formation deposited when a great variety of dinosaurs roamed the earth. Dumont and her assistant Dan Polaski reconstructed the cranium from CT scans by painstakingly moving bone fragments back into place and filling in missing bone with mirror images of the same bone from the other side of the skull. Dumont reconstructed the chewing muscles based on comparison to living rodents and used engineering-based models to predict how the jaws moved and how hard the animal could bite.

*Vintana's* massive chewing muscles moved the jaw upward and backward and

<http://phys.org/news/2014-11-madagascar-fossil-skull-insights-life.html>

## Rare fossilized embryos more than 500 million years old found



Cambrian embryo fossil exposed by acid etching on rock surface. Polygonal structure on surface indicative of blastula-stage of development.

2014.12.26

"Before the Ediacaran and Cambrian Periods, organisms were unicellular and simple," said James Schiffbauer, assistant professor of geological sciences in the MU College of Arts and Science. "The

Cambrian Period, which occurred between 540 million and 485 million years ago, ushered in the advent of shells. Over time, shells and exoskeletons can be fossilized, giving scientists clues into how organisms existed millions of years ago. This adaptation provided protection and structural integrity for organisms. My work focuses on those harder-to-find, soft-tissue organisms that weren't preserved quite as easily and aren't quite as plentiful."

Schiffbauer and his team, including Jesse Broce, a Huggins Scholar doctoral student in the Department of Geological Sciences at MU, now are studying fossilized embryos in rocks that provide rare opportunities to study the origins and developmental biology of early animals during the Cambrian explosion.

Broce collected fossils from the lower Cambrian Shuijingtuo Formation in the Hubei Province of South China and analyzed samples to determine the chemical makeup of the rocks. Soft tissue fossils have different chemical patterns than harder, skeletal remains, helping researchers identify the processes that contributed to their preservation. It is important to understand how the fossils were preserved, because their chemical makeups can also offer clues about the nature of the organisms' original tissues, Schiffbauer said.

"Something obviously went wrong in these fossils," Schiffbauer said. "Our Earth has a pretty good way of cleaning up after things die. Here, the cells' self-destructive mechanisms didn't happen, and these soft tissues could be preserved. While studying the fossils we collected, we found over 140 spherically shaped fossils, some of which include features that are reminiscent of division stage embryos, essentially frozen in time."

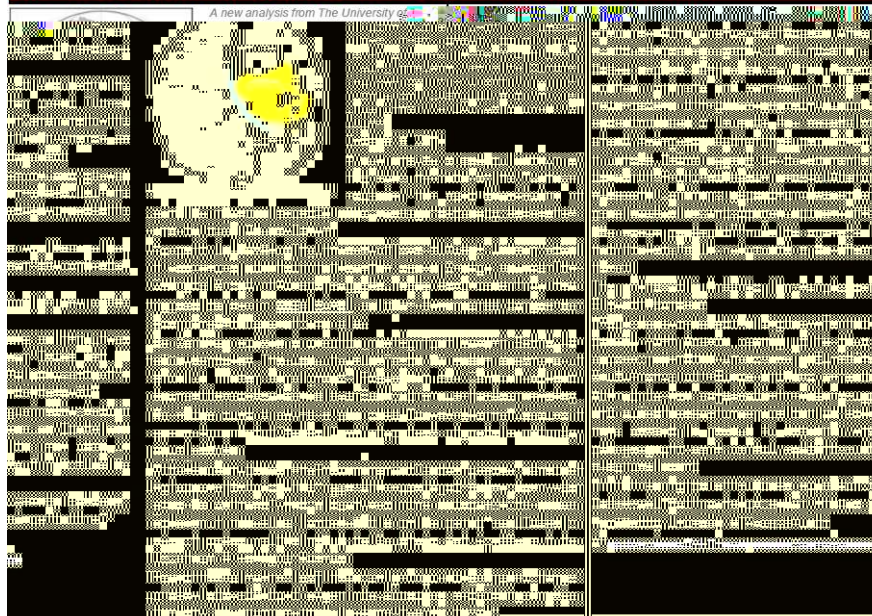
The fossilized embryos the researchers found were significantly smaller than other fossil embryos from the same time period, suggesting they represent a yet undescribed organism. Additional research will focus on identifying the parents of these embryos, and their evolutionary position.

Schiffbauer and his colleagues published this and related research in a volume of the *Journal of Paleontology* which he co-edited.

At <http://www.geologyin.com/2014/12/rare-fossilized-embryos-more-than-500.html>

<http://www.geologyin.com/2014/12/rare-fossilized-embryos-more-than-500.html>

## Massive geographic change may have triggered explosion of animal life



<http://phys.org/news/2014-10-massive-geographic-triggered-explosion-animal.html>

## 100-Million-Year-Old Spider Attack Recorded in Amber

Image: Oregon State University



2015.01.18

Trapped in a piece of amber, the juvenile spider appears to be on the cusp of devouring a male wasp that was caught in its web. Such a grisly scene between spider and prey has never before been found in the fossil record.

The amazing snapshot shows an event that occurred in the Early Cretaceous

period, about 97 to 110 million years ago, in the Hukawng Valley of Myanmar, "almost certainly with dinosaurs wandering nearby," as the press release about this discovery reports. The spider is a social orb-weaver spider, formally known as *Geratonephila burmanica*, and its victim is a wasp of the species *Cascoscelio incassus*. Both species are extinct today but the fossil suggests that insect behavior from the past is not too different from the present.

Related wasp species are known to parasitize spider eggs, so there is some poetic justice in the spider's attack. "This was the wasp's worst nightmare, and it never ended. The wasp was watching the spider just as it was about to be attacked, when tree resin flowed over and captured both of them," said entomologist George Poinar Jr. of Oregon State University in the release.

This latest fossil doesn't just capture the dramatic spider attack but also evidence of spider social life in the Early Cretaceous. Another spider, an adult male, is captured some distance away in the amber, co-habiting on the same web as the juvenile. Males of modern-day social orb-weavers are typically found living on female-constructed webs, where they assist in capturing insects and maintaining the web.

Droplets on the fossil web also contain aerial plankton (pollen, spores and dust particles) from the time. A paper about the discovery appears Oct. 8 in the journal *Historical Biology*.

At <http://www.geologyin.com/2014/08/100-million-year-old-spider-attack.html>

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**Friday, 26<sup>th</sup> June 2015**

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