

PalNews



Biannual newsletter of the Palaeontological Society of Southern Africa February 2018



Karoo photography: A photo taken by Emese Bordy's cousin, Cristian Maral during an ESI Dino Lab-Birmingham lab trip to the *Cynognathus* Assemblage Zone in November 2017. You can look at more of his work online at <http://www.maralphoto.com>.

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PalNews is published by the Palaeontological Society of Southern Africa for its members. The views expressed are not necessarily those of the society or its officers.

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From the Editor

Happy belated new year fellow members! I hope your year is off to a good start, and by the looks of it, many of you are already planning a lot of exciting research for 2018. We are also welcoming new people into our community this year, and many have contributed to this first issue for the year!

As our community grows, it is important that we make sure our community remains a welcoming group to young researchers, particularly women and people of colour. Many of you probably have heard of the backlash currently going on in Hollywood against Harvey Weinstein, the #metoo campaign, and the #timesup campaign that began at the beginning of this year.

No woman on the planet is unable to say #metoo (myself included). So, I hope the #metoo and #timesup campaigns will inspire you this year to take action if you encounter sexism and racism in our community and your workplace, wherever it appears. How your institute deals with these issues is very important in making the research space a transformed and welcoming space for all.

To inspire you, I have included an article titled *Ebony in an Ivory Tower*, written by the Evolutionary Studies Institute's Ms. Kimberleigh Tommy (MSc candidate) named one of *Science Today's* Top 20 Postgraduate Writers for 2017 for this and a number of other science-

related articles. Her writing and research has been featured, along with many other trailblazing female scientists in *The Female Scientist*, which aims to increase the public presence of female scientists (See more at thefemalescientist.com). In future, I would like to try and feature writing by young emerging scientists in our community, and provide a platform for women and people of colour joining our community. So if you have a talented student who has written something please send it over and I'll feature it.

The image shown in this issue's featured article is one of the most iconic images in South African history. On 9 August 1956 over 20 000 women marched to the Union Buildings to protest against the Apartheid pass laws. We now celebrate our national Women's Day on 9 August to commemorate the bravery of these women. They are a testimony to the power of our collective. In the words of the freedom song of the women who bravely marched so that all could be free in this country, "*Wathint' abafazi wathint' imbokodo*" (When you strike the women, you strike a rock).

Amandla!

Pia

Ebony in an Ivory Tower

By Kimberleigh Tommy
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When I started writing this article, I thought of the words of former South African president Thabo Mbeki, *"I am an African, I owe my being to the hills and the valleys, the mountains and the glades, the rivers, the deserts, the trees, the flowers, the seas and the ever changing seasons that define the face of our native land."* That is what I am, before I am a scientist, I am an African. And I have fallen in love with a science that has never loved people like me.

Science has been used as a weapon in the past to further the agenda of oppressive powers, one of which has directly impacted me, my family and my opinions. On 27 April 1994, the world watched South Africa take their first tentative, but joyous steps into democracy after over 40 years under the Apartheid regime, and an even longer history marred by slavery, genocide and abuse of the black and Khoi communities.

Pseudoscience was weaponised, the world took up arms against black skin, we were told we were a separate inferior sub-species of human, characterised by small brains, high sex drives and aggression among other derogatory "characteristics". Our people were stripped from the land of their birth and taken to foreign countries to be paraded as anatomical anomalies. We remember the women like Sara Baartman and the others whose names have been lost to history. We remember the Tuskegee experiment, we remember the black bodies that scientists poked and prodded, infected and killed under the pretence



**"...you cannot transform what you do not understand
and you cannot understand what you do not listen to"**

of scientific curiosity and advancement. This war claimed the lives of our people, we were hunted like animals, shot, killed, and our bodies sent to prestigious institutions for research purposes, without our knowledge or consent. We remember the people whose identities we may never know, whose bones lay in wait for a burial that might never come.

I can't recall how many times my pain has been trivialised to statements like "those were different times" and "we know better now", or my personal favourite as a South African "Apartheid is over". As if I don't see the wounds of systemic oppression and racism in the eyes of my loved ones and the communities that raised me. Racism in science is not dead. I repeat, racism in science is not dead.

This mentality has filtered down into the 21st century with papers published in prestigious, peer-reviewed journals, filled with racist undertones. Not only has this racism been perpetuated in scientific communities but also in main stream documentaries where pseudoscience would sooner believe an extra-terrestrial capable of building the pyramids than a person with black skin. Not only is the research still touched by racism but academic institutions have come under fire, for a lack of transformation, a lack of representation of people of colour.

Being a woman of colour in my field, in any field, of science is challenging. The marginalisation of women in science is by no means a new topic and not unique to any one continent. Women remain the minority in science, technology, engineering and mathematics, commonly known as STEM, it is estimated that globally women account for only 30% of scientific positions, although accounting for almost 60% of the university population. Of that 30%, less than 5% are black. Focusing on South Africa, in 2015, 83% of South African academic staff/professors were white, meaning that 17% were Black, Indian and Coloured, but represent the vast majority of our population.

In 2014, the Mail & Guardian reported that out of 4000 professors in South Africa, only 4% are black and fewer still are black women. Understanding the paucity of black South African academics in a post-Apartheid nation is crucial to understanding the long lasting effects of systemic oppression, and how even the generations that came after Apartheid was abolished are still trying to free themselves from the shackles it has left behind.

But you cannot transform what you do not understand and you cannot understand what you do not listen to.

Representation of women of colour in academia is a global problem and in order to address it, we need people to talk. Race is seen as taboo, but no longer will we allow the conversation to continue without our input, no matter how uncomfortable it may be. Uncomfortable conversations are the womb that fosters the growth of important questions, ideas and ultimately solutions, and we are tired (so tired) of sacrificing our mental and physical well-being for the comfort of others. We need people to come forward with their stories. We need to facilitate conversations, and I mean REAL conversations, where women of colour are LISTENED to, not spoken over, not disregarded and not told we are dramatic or that our pain is a thing of the past.

Diversifying the academic and research body serves to better science, bringing to the forefront new ideas, different perspectives and ensures accountability. Diversify is a verb, a word used to describe an action, and that's what we need, ACTION. We need to increase accessibility for students of colour into career paths that were previously unavailable to them and to support them on this journey. We simply need to do more and, more importantly, do better.

We need our voices to bellow through the ivory tower, until the vibrations of our collective pain, anguish, and ultimately hope, rattle the foundations and bring it to the ground. Because we love a science that never loved us and instead of hiding in the shadows of this unhealthy power dynamic, we stand in the sun and demand a day when science acknowledges who we are.

The Centre for Excellence in Palaeoscience turns 5

By Bruce Rubidge and Christine Steininger
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The National Research and Development Strategy of South Africa identifies a number of knowledge fields in which South Africa should aim at achieving international research excellence because of our geographical position and natural or cultural heritage. The Palaeosciences (collectively including Palaeontology, Palaeo-anthropology, Palaeobotany, Middle Stone Age Archaeology and related disciplines) are areas in which South Africa has a geographical advantage, owing to the quantity and diversity of finds within our national borders.

The DST strategy document addresses five goals which recognise the need for a holistic approach to the development of palaeosciences: transform the minds of South Africans so as to instill a sense of pride and provide the intellectual content to their African heritage; support the country's universities to produce a critical mass of palaeoscience researchers with a range of research, technical, curatorial, public engagement and managerial skills; enhance the capacity of museums to curate, conduct and support research in palaeosciences; ensure that South Africa's palaeoscience heritage is well managed and used for the benefit of current and future generations; make South Africa the destination of choice for palaeo-tourism. The establishment of a DST-NRF funded Centre of Excellence in Palaeosciences (CoE-Palaeo) has been by far the most productive way to realise the goals of this strategy.

CoE-Palaeo was set up in May 2013 and is already into its fifth year of operation. It is hosted by Wits University, operates across 6 partner institutions: University of the Witwatersrand, University of Cape Town, Iziko Museums, National Museum, Albany Museum and Ditsong Museum, and is unique in being the only CoE to have natural history museums as partners. Our Centre has an extensive network of collaborators who greatly enhance the quality and scope of research projects the Centre undertakes, and also provides a superior training experience to all of our students. The Centre adopts a multi- and inter-disciplinary approach to interpret our unique South African Fossil Heritage. Use of South Africa's large fossil and archaeological collections is enhanced through the development of a shared digital database of CoE-Palaeo partner institutions which enables long-lasting network and collaboration. Curatorial efficiency has been increased by the development of a newly established PanAfrican Curatorial Network. We commit to expanding our collaborative horizons to include researchers at other Universities, Southern African Association of Science and Technology Centres (SAASTEC), South African Museums Association (SAMA), South African Agency for Science and Technology Advancement (SAASTA) and South African Heritage Resource Agency (SAHRA).

To achieve its mandate, the Centre undertakes a diverse range of research projects including the origin of life and multicellularity, invertebrate palaeobiology, palynology, and palaeobotany of various ages, taxonomy and palaeobiogeography of fishes, amphibians, parareptiles,

therapsids and dinosaurs, origins of mammals and hominins. Research projects regarding hominin morphology and behaviour, the earliest tools of hominins, the emergence of behavioural complexity, faunal analysis, bone taphonomy are also supported. Additionally palaeontology is applied in groundbreaking broader multidisciplinary studies to understand climate and biodiversity change, stratigraphy and basin development studies.

The Centre is currently funding 40 South African Researchers (of which there are 5 A, 7 B, 9 C, and 1 P, and 22 rated scientists) and a growing number of postgraduate students. The Centre funds research excellence and is proud of the ever increasing productivity in terms of publications in international peer reviewed (from 22 book chapters, 65 papers in 2013 to 19 book chapters, 140 papers in 2016) as the Centre has become more established. To aid in boosting research productivity within our South African Natural History Museums, the Centre initiated a three-year postdoctoral fellowship with an additional research grant to exceptional researchers. This initiative has been embraced happily by all of the partner museums and will hopefully aid in expanding their research productivity.

The DST strategy for the Palaeosciences recognises the scarcity of well-trained human capacity as the most serious threat facing the discipline of palaeosciences. To address this issue, over the past five years, the CoE-Palaeo has funded and trained palaeoscience expertise at various levels, including school learners, technicians, collections curators, palaeotourism guides as well as undergraduate and postgraduate students and we intend

growing this in the future subject to availability of funding. Apart from supervising more than 30 MSc and PhD students, members of the CoE-Palaeo also teach in undergraduate and honours programmes in the archaeology, geosciences, and biological science curricula of Rhodes University, University of Cape Town and the University of the Witwatersrand. Every effort is made to ensure that the students are representative of the demographics of South Africa. In the short existence of the CoE the number of students from designated groups has greatly increased. While the CoE-Palaeo has limited input in staff recruitment in a previously male dominated field, advances have been made in the employment of research staff from designated groups at our partner institutions. In addition, CoE-Palaeo members are strongly involved in mentoring new staff and students and strong efforts will continue to be made to address race and gender imbalances.

Knowledge brokerage and service rendering are an essential aspect of the Centre output and happily almost all CoE-Palaeo researchers and students enthusiastically participate in science communication or public awareness. The growth of science communication has been exponential in part due to the ever expanding number of social media platforms. These platforms have been embraced by multiple institutions and a variety of different scientific fields and this increased ease of access to information in real time has stimulated growth of public desire for more information about the palaeosciences. Not only has science communication allowed for the sharing of information, it has provided the CoE-Palaeo with an opportunity for increased engagement with members outside of the research community.

This has made a substantial contribution to the public awareness of, and sympathy for our discipline. Over the past year of science communication, a number of CoE-Palaeo students have participated successfully in national competitions, which includes Dr Kerryn Warren winner of the 3-Minute-Thesis competition (SAASTA) and 2017 Runner up of audio section of the SAASTA Young Communicators Competition 2017, Ms Aviwe Matiwane (PhD candidate) a finalist in FameLab 2017, Ms Kimberley Chapelle (PhD candidate) winner of the best presentation at the Sixth Symposium on Dinosaur Eggs and Babies 2017, Mr. Silindokuhle Mavuso (MSc candidate) the winner of the Wits Science Slam 2017, and Ms. Kimberleigh Tommy (MSc candidate) named one of Science Today Top 20 Postgraduate Writers for 2017. The CoE also makes a special effort to communicate the results of its research to the broader public through the very willing and efficient co-operation of the Wits media office and by supporting the science communication efforts of grantees through articles, blogs and interviews.

In addition the Centre supports outreach initiatives headed by a team of Palaeoscience Outreach officers consisting of staff and students alike. The reach of this extensive programme has grown every year and in 2017 reached approximately 493 515 learners, teachers and members of public through his various exhibitions and programmes. In 2017 the CoE Palaeo funded outreach team received the award for the Best Exhibit and Curriculum Workshop at the Grahamstown Science Festival.

The CoE recognizes the uniqueness and importance of the southern African fossil and archaeological heritage and its significance to South Africa and the rest of the world and

is committed to the objectives outlined in the South African Strategy for the Palaeosciences. We have learnt a great deal in the first cycle of the CoE, and as we are preparing the 5-year review documentation it is time to take stock of our successes and failures. The palaeoscientists of South Africa and their collaborators are the life-blood of the Centre and we are dependent on each of you to ensure the future success of the CoE. We will be visiting all our partner institutions over the next 3 months and hope that you will make use of the opportunity to meet with us and share ideas as to how the CoE can more effectively meet the requirements of the palaeoscience community over the next five years.



“We’re In It Together” National Earth Science Museum

By Helke Mocke

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Above: Doing experiments during the Science Festival.

Below: Happy kids with their colouring books during Heritage Week.

The National Earth Science Museum (NESM) at the Geological Survey of Namibia, Ministry of Mines and Energy (MME) was established in 1995 and is the only geoscience museum in Namibia. The museum partici-

-pates in the Heritage Week celebrations annually by providing special and tailor-made activities to the public and this year it celebrated Heritage Week on the 18 – 22 September 2017 under the theme “We’re in it together”.

Special activities, information sheets, questionnaires and worksheets were designed and prepared for school groups attending the Heritage Week. The activities were provided by demonstrators at five stations and included performing experiments to test for the properties of rocks and minerals, how to identify meteorites, how fossils form and digging for dinosaur bones, how earthquakes form and their effects, and finally the role of geosciences in town planning and environmental monitoring.

After each activity the pupils had a chance to test their knowledge by filling in a worksheet or questionnaire. All pupils received promotional materials afterwards, such as the pencil cases with stationary, t-shirts, hats and colouring books. A record number of 906 pupils visited the museum during this year’s Heritage Week in the NESM, thus making this the best Heritage Week for the museum to date, when looking at visitor numbers.

This year’s Heritage Week would not have been possible without the donations that were received from certain institutions or organisations. A generous donation of N\$ 15 000 was made by Debmarine Namibia for the purchase of promotional material comprising the design of a logo of the museum dinosaur mascot, “Massy” and printed t-shirts. YES Network Namibia sponsored the design and manufacture of the Heritage Week banner at a cost of

N\$ 15 000 was made by Debmarine Namibia for the purchase of promotional material comprising the design of a logo of the museum dinosaur mascot, “Massy” and printed t-shirts. YES Network Namibia sponsored the design and manufacture of the Heritage Week banner at a cost of N\$ 1 600.80 and the Geological Society of Namibia donated beautiful colouring books creating awareness of Namibia’s geological treasures.

A field trip was undertaken to the Sandwich Harbour in the Namib Naukluft Park on 21 October to excavate bones reported from there by a tour guide. Another tour guide provided a brown hyena lower jaw fragment, which he had collected from the same area several months before. The excavated bones, which turned out to be those of an Oryx, were buried in a peat deposit which formed during a period when the Kuiseb palaeodelta was still very active. A German work group from the GeoArchives Project obtained ages from approximately 1364-733 BP for the peat and other lagoon deposits in the vicinity, where mollusks and reeds were found.

From July-December 2017 the NESM was featured in the local newspaper, Republikein, on NBC National TV and on the English National Radio Station. An article titled “skatkis van fossiele” i.e. “treasure trove of fossils” was written for the Republikein in conjunction with the journalist, Ms Tanja Bause. The article gave an overview of some of the most spectacular fossils found in Namibia to date and was published on the 14th of July. On the 6-10th November 2017 the NESM participated at the Science Week, which was held at the Goethe Institute in Windhoek. Special activities on the properties of rocks, minerals and meteorites were prepared for the Science Week, which was well attended by many local school



Above: Sandwich Harbour peat deposit. **Below:** Left lower jaw of Sandwich Harbour Oryx.

groups. More than 270 pupils visited the event. Articles on the Science Week were featured in the *Confidante*, *Namibian*, *Windhoek express*, *Allgemeine Zeitung*, and *New Era*.

A publication titled “The postcranial anatomy of *Diademodon tetragonus* (Cynodontia, Cynognathia)” was co-authored with Dr Leandro Gaetano and Dr Fernando Abdala and will be published in the *Journal of Vertebrate Paleontology* in due course.

Exploring pre-extinction vertebrate fauna of Late Triassic Zimbabwe

By Steve Tolan

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In late July 2017, a team consisting of Mr Chris Griffin (right), a PhD Student from Virginia Tech, USA, Mr Darlington Munkiywa, Mr Mike Zondo and Ms Hazel Taruvinga from Zimbabwe's National Museums & Monuments, Mr Tim Broderick, a geologist and fossil expert based in Harare and yours truly, a fossil enthusiast from Zambia, met in Harare at the start of a 2-week expedition.

The first destination was close to the Mozambique border in the NE of Zimbabwe. We set up camp that afternoon, and the following day we set off on the first day in the field and almost immediately came across closely-linked sites full of bones, which were quickly identified as rhynchosaur, due to the diagnostic maxillae (upper jaw bones) that were fairly common. Many cranial and postcranial bones were strewn across the surface, and there is no doubt that many more await excavation under the eroding surface in the immediate area. The matrix was mostly of soft brown and red mudstones within the Pebbly Arkose Formation, and the bones were generally free of any hard matrix.

As rhynchosaur only existed in the Middle to earliest Late Triassic, this accurately dated the area we were collecting in. As we extended our search from the initial group of outcrops, Hazel found a broken femur that Chris immediately identified as dinosaurian. Two more dinosaur limb-bones were quickly found, from different individuals,



before the fourth dinosaur bone led Chris to start excavating a small area within an exposure, where he saw a limb bone sticking out from the mudstone. Over the next few days, meticulous excavation led to the uncovering of an almost-complete and mostly-articulated skeleton of a small dinosaur with gracile bones, around the size of a medium-sized dog. Many vertebrae, almost to the tip of the tail, limb-bones, some metatarsals right down to individual claw bones, the hips and elements of the skull. Some of the skeleton was removed a bone at a time, whereas the central jumble of bones, which seemed slightly less articulated, was wrapped in a plaster jacket to protect it on its long journey to Virginia Tech in the States, where the bones will be prepared and studied.

While this work was going on, some of the team spread out and found more material, both rhynchosaur and teeth-filled dentaries (lower jaw bones), some with rhomboidal teeth of traversodontid cynodonts, cf. *Luangwa drysdalli*, plus at least one other type of cynodont, cf. *Aleodon*. These are the first cynodonts ever found in Zimbabwe, and should help correlate the finds with similar formations, e.g. the Ntawere Formation in the Luangwa Valley, Zambia and the Manda Formation in Ruhuhu, Tanzania.

Other fossil sites were found up to several kilometres away from the main group of outcrops, and the whole area is worthy of much more exploration in the future, and a return is planned in 2018 with a larger team. After a very successful start, the expedition moved on to Chewore Safari Area where similar beds were found, though no fossils were located.

The team then moved to the Omay district, south of Lake Kariba, where various non-Triassic sites were explored, producing fossils as diverse as Plio-Pleistocene mammals, (the teeth and jawbone of cf. buffalo or giraffe, plus suidae) and chelonia fossils, to Permian dicynodonts and possible gorgonopsians

Dr Christian Kammerer was kind enough to suggest identifications of the cynodont fossils, and an unexpected benefit of the expedition was that Christian was asked by Darlington Munyikwa to identify from photographs a large Mid Permian skull that Darlington had found 2 years earlier, and which Christian immediately recognised as a very large therocephalian, which is planned to be published.

Thanks to Robin Whatley for her help with the rhynchosaur material, Mike Raath for his excellent advice and to the Zimbabwean authorities for facilitating the release of some fossils to America for preparation and study. Thanks too to National Geographic for seeing the potential in this initial exploration of Zimbabwe and providing the funds for the expedition.

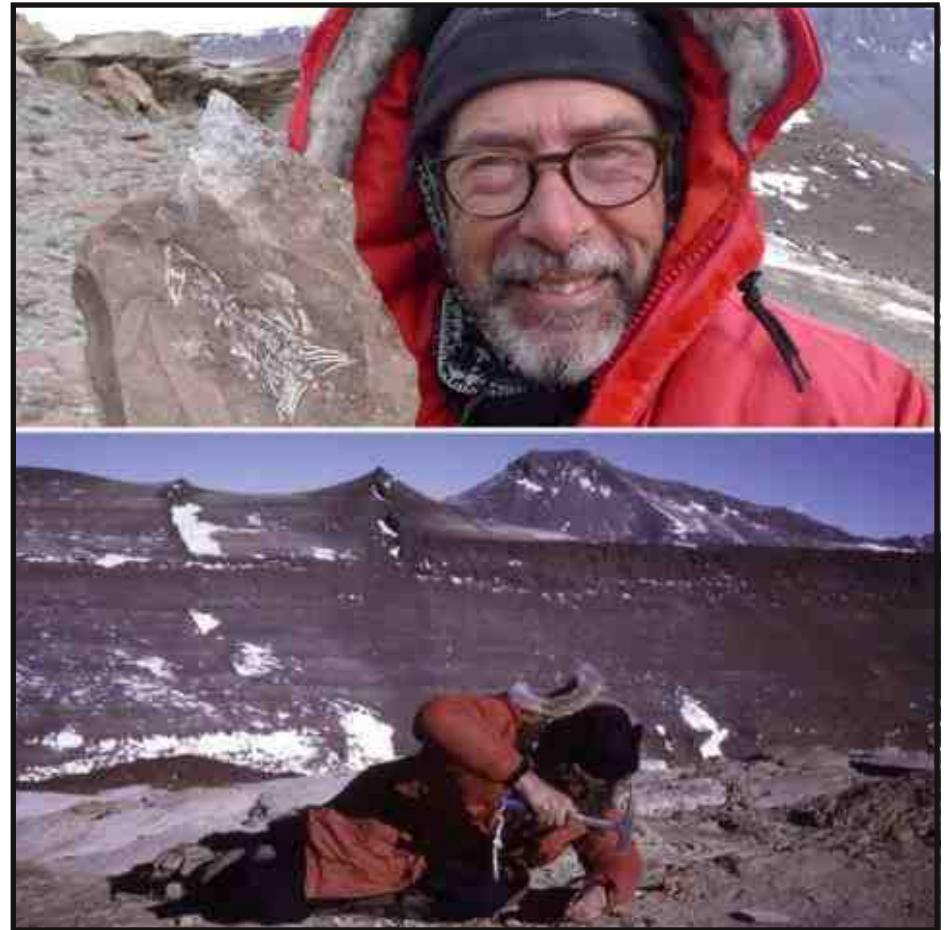


Palaeontologists return from Antarctica

By Christian Sidor
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Paleontologists returned to the Shackleton Glacier Region of Antarctica in December 2017 to January 2018 to study the Triassic rocks of the Fremouw Formation. The team (Above) included Christian Sidor and Megan Whitney (University of Washington), Roger Smith (ESI), Nate Smith and Hank Woolley (Natural History Museum of LA County), Peter Makovicky and Akiko Shinya (Field



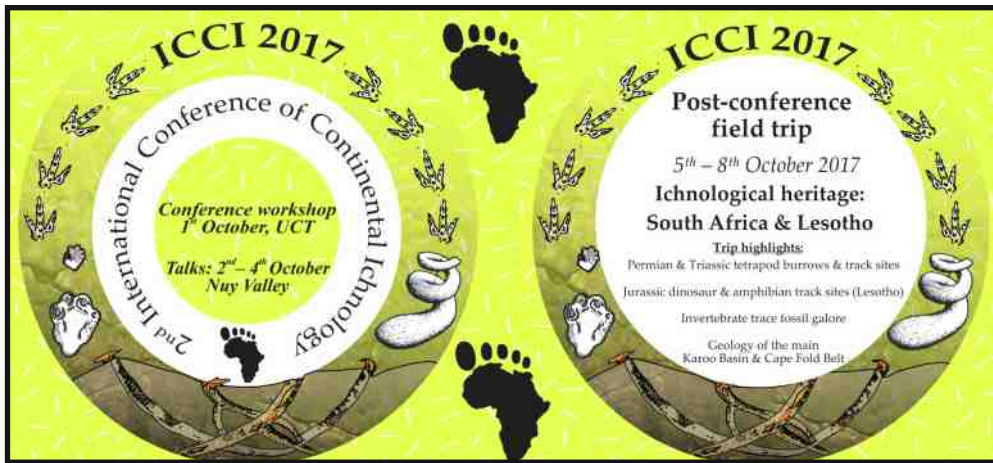
Above: Roger Smith showing off a fossil found in the Shackleton Glacier Region. **Below:** James Kitching at the same site during his visit in 1971.

Museum), Neil Tabor and Julia McIntosh (Southern Methodist University), as well as mountaineer Peter Braddock. They studied famous localities like Kitching Ridge, *Thrinaxodon* Col, and Shenk Peak and recovered a remarkable collection of fossils, including some of the first identifiable fossils from the middle member of the Fremouw Formation.

UCT Sedimentology-Palaeontology Group hosts successful ICCI conference

By Emese Bordy

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The 2nd International Conference of Continental Ichnology (ICCI 2017) was held in Nuy Valley (Western Cape Winelands) and followed by a field trip across South Africa to Lesotho from 1st to 8th of October 2017.

The conference was organised by Dr Emese Bordy and post-graduate students of the Sedimentology-Palaeontology Group at UCT, and was attended by 50 international delegates from Canada, USA, Uruguay, Argentina, France, Germany, Sweden, Switzerland, Russia, Spain, UK, Italy, Poland, South Africa and Lesotho. One third of the delegates were postgraduate students, and about of a quarter of them were international students.

The conference was dedicated to the study of continental trace fossils, and delegates presented research that focused on investigating various ichnofossils such as burrows,

nests, tracks and trails. These are important not only for detailed characterisation of past depositional environments, recognition of unconformities, prospecting for hydrocarbon resources, and biostratigraphic subdivisions, but also for the direct link they provide to ancient animal behaviour. All of which are geared towards the better interpretation of the geological record.

In the recent decades, this mostly field-based geoscience research theme, which bridges palaeontology and sedimentology, has been neglected in southern Africa, in spite of the rich trace fossils heritage of the region. This conference therefore was a wonderful opportunity to promote and further develop ichnological research in southern Africa, most of all for the benefit of our postgraduate students and early (and not so early) career geoscientists.



Above: Delegates at the ICCI 2017 during the conference dinner in Nuy Valley.

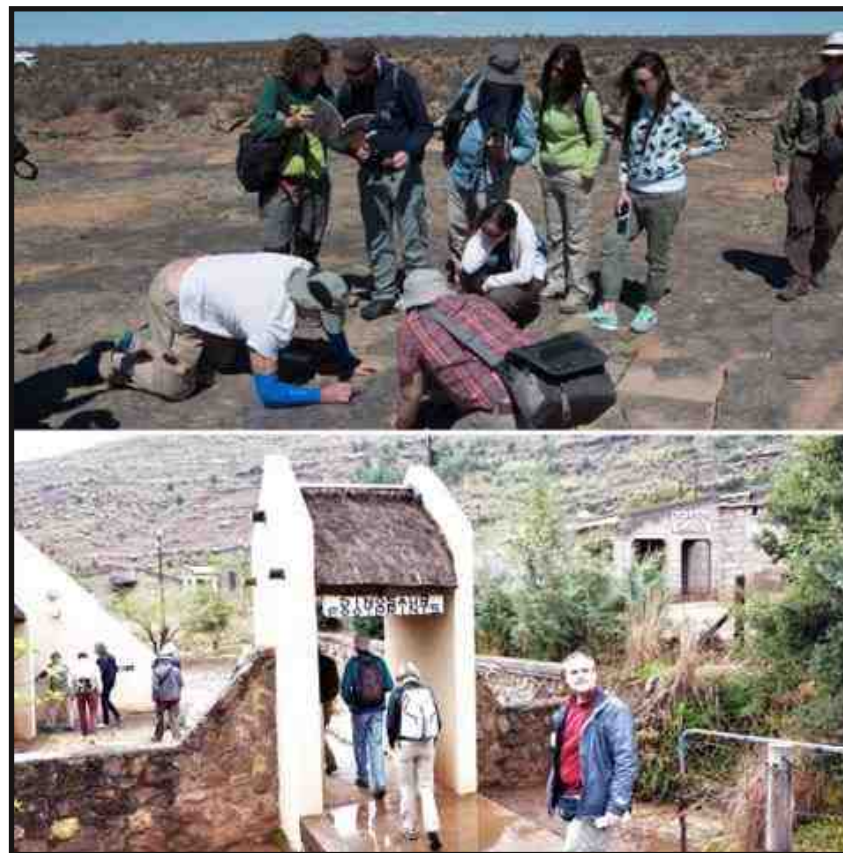
The ICCI kicked off on 1st October with a full day photogrammetry workshop that was led by Dr Matteo Belvedere (Office de la culture, Paléontologie A16 Porrentruy, Switzerland) in the Department of Geological Sciences at UCT.

The conference was officially opened by Prof Bruce Rubidge (Director at South African Centre of Excellence in Palaeosciences) in Nuy Valley and was followed by a string of scientific events during the week. These included keynote talks by Profs Daniel Hembree (Ohio, USA), Alfred Uchman (Krakow, Poland), and Andrew Rindsberg (Alabama, USA), and a multitude of oral and poster presentations. The conference was concluded by an ichnological and geological field trip across the main Karoo Basin, which showcased some of the best ichnological outcrops in South Africa and Lesotho. All in all, these events provided several invaluable opportunities for learning, networking, and exploring current ideas of continental ichnology.

Based on a democratic vote, the best student presentation award was given to Mr Martin Qvarnström, a PhD Student from Uppsala University and the second prize went to Ms Miengah Abrahams, a PhD Student from University of Cape Town. The best presentation prize in the researcher category was awarded to Dr Charles Helm, who is affiliated with the Peace Region Palaeontology Research Centre (Canada) and is an associate at the Centre for Coastal Palaeoscience (NMMU, South Africa).

Based on the feedback received so far, the event was an enjoyable experience and an exciting break from the usual academic routine for all colleagues, senior and

junior alike. The ICCI 2017 program allowed plenty of time for socialising, meeting potential collaborators and networking among peers, but good science, above all else, defined the event.



Delegates at the ICCI 2017 during the field trip. **Above:** Gansfontein palaeosurface at Fraserburg, Sotuh Africa. **Below:** Lower Moyeni palaeosurface, Quthing, Lesotho.

The ICCI 2017 was made possible by the sponsorship received from the following organizations:



Research at Iziko: The microfauna from South African fossil sites

By Thalassa Matthews

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I am currently going into the third year of a project which involves South African fossil sites from the west and south coasts, and the interior. My research is focussed on palaeoenvironmental reconstruction using fossil microfauna (frogs and micromammals) as palaeo-environmental and palaeoclimatic proxies, and also at understanding changes in the distribution of micromammals and frogs from the Early Pliocene to the present.

My studies include some 15 archaeological/palaeontological sites, evenly spaced over a distance of some 1700 km along the west, south and east coasts of South Africa. This project utilises taxonomic and taphonomic studies of fossil micromammal and frog assemblages to promote insight into the varying response of ecosystems to glacial/interglacial cycles along the South African coast, and to elucidate patterns of micromammalian and anuran evolution and migration since the Early Pliocene.

There is considerable debate as to how Quaternary climates have influenced South Africa's coastal ecosystems. The potential of micromammals from coastal fossil sites for tracking and unravelling such interwoven threads of climate change, geomorphology and oceanography has not been fully realized and forms an integral part of this research. The microfauna also assists in providing a context for current research on the origin



Above: The above images were taken after rendering the humerus and ilium out from a computed tomography scan of a Caco (*Cacosternum capense* (TM 11956)). The humerus and ilium are among the most useful bones for identifying frog taxa and work is currently underway to publish identification guides for these two bones to assist in the identification of fossil frog material (*Cacosternum* photo by Brouard Jean-Paul; Luke Durkan, 2011. URL: FrogMAP: 696).

of modern humans at several of the fossil sites. Fossil frog assemblages frequently remain unanalysed due to a lack of

specialist knowledge, and the fact that their potential for the reconstruction of palaeoenvironments is largely unappreciated. Frogs are, however, highly sensitive to fluctuations in moisture levels and temperature, whereas micromammals respond more to changes in vegetation - thus used in tandem these taxa are highly complementary. Research at older sites, such as Langebaanweg (5 Ma) and Cooper's Cave (1.5 Ma) contributes new palaeo-environmental information, and also casts a light on relatively unknown areas, such as the evolution of the Cape amphibian fauna, and the roots of the high degree of endemism of southwestern Cape frogs.

A few of the broader research questions include;

- What evidence do the frog faunas provide for changes in seasonality and rainfall over time on the west and south coasts of South Africa?
- How have the distributions of micromammals and frogs in South Africa changed since the Early Pleistocene, and what are the palaeoenvironmental implications of these shifts?
- How 'wet' do the cooler periods on the west coast appear to be relative to interglacial periods? When did the current summer-dry, low rainfall adapted frog population become established on the west coast?

Another component of this project involves building up a comparative reference database of photographs and CT scans of the skeletons of fossil and extant frog taxa to enable identification of fossil taxa - no such reference collection currently exists. To date I have scanned almost all extant Southern African frog genera.

News from Sefako Makgatho Health Sciences University

By Johann Welman

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Medunsa became a brand new University in 2015 named the Sefako Makgatho Health Sciences University. I am continuing to teach third year undergraduate and Honours level Palaeontology courses in the Biology Department third year and Honours level. My research also continues on the origin of birds.

I currently have two MSc students namely Mr. Kagiso Mooki who works on tooth replacement in *Proterosuchus* and Ms. Millicent Baloyi who is redescrining the braincase of *Proterosuchus*. The practical component of these projects is done at the Micro CT Scanner at Evolutionary Studies Insitute (ESI), University of the Witwatersrand.

News from the Karoo Palaeontology Department, National Museum

By Jennifer Botha-Brink
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Above: Attendees of the 4th International Symposium on Paleohistology in Trenton, New Jersey held in July 2017.

It has been a while since we have reported on our department. Despite a rather tumultuous 2017 with the suspension of our Upper Management and subsequent impediment to completing our administrative processes, we managed to keep afloat and even get some research done in the process! An exciting development was the addition of a new Postdoctoral Fellow to the department. Dr Lucas Legendre has joined us from Paris, France to work on the limb bone histological characteristics of digging mammals.

So far, he has looked at the armadillo, nine-banded armadillo and American badger, and has been obtaining some interesting results, which will be submitted for publication in the coming months. His work will event-

ually go towards the search for such osteo-histological features in Triassic burrowing therapsids. Sadly, our osteohistology technician, Bobby Eloff, moved away, but a new technician, Sekhomotso Gubuza, joined us in April 2017, and she is already part of the palaeo family.

I continued to work with Drs Adam Huttenlocker (UCLA, Los Angeles, USA), Sean Modesto (Cape Breton University, Cape Breton, Canada), Rose Prevec (Albany Museum, Grahamstown) and Roger Smith and Pia Viglietti (Evolutionary Studies Institute, University of the Witwatersrand) on our Permo-Triassic boundary site in the Free State.

The carbon and oxygen isotope analyses are complete and the radiometric dating of the sequence is almost done. The project should be submitted for publication in the coming months.

Lucas and I also travelled to the states and presented at the 4th International Symposium on Paleohistology in Trenton, New Jersey in July 2017 and I attended the 77th Society of Vertebrate Paleontology conference in Calgary, Canada in August 2017 where I presented on Brazilian prozostrodontian cynodont osteohistology. I'm currently writing up the research for submission, while working on other osteohistological projects.

Elize Butler submitted an article from her MSc on the postcrania of *Galesaurus planiceps* to Palaeontology and is still working on the cranial description of her new gorgonopsian for her PhD.

MSc student, Alex Botha, completed his thesis in 2017, which was on the osteo-histology of the leopard tortoise, *Stigmochelus pardalis*.

Luke Norton is continuing his PhD on tooth replacement in various cynodonts and is close to submitting an article on *Galesaurus* tooth replacement.

PhD student, Fabio Hiratsuga Veiga, has now completed and submitted two articles for his thesis, one on Brazilian traversodontid cynodont osteohistology and the other on the femoral osteohistology of a silesaurid dinosauriform, also from Brazil.

PhD student, Kimi Chapelle from ESI, Wits, will also be joining our lab this year to work on *Massospondylus carinatus* limb bone osteohistology. She will be looking at changes in osteohistology through ontogeny, from embryo to adult, a project that promises to produce exciting results. So 2018 promises to be another busy year for the Karoo Palaeontology Department.

What's New in 2018 at the Albany Museum

By Aviwe Matiwane, Sydney Moyo and Rose Prevec
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We are proud to announce the new members of our wonderful Earth Sciences family. Our team is a dynamic group consisting of staff, students and researchers.

Mr Sinethemba Maleke and Ms Siyasanga Mnciva are our lovely new preparators; they joined the department of earth science team last year. Mr Maleke, a psychology student from Nelson Mandela University, joined our team in April, while Ms Mnciva, a Botany Honours student from Walter Sisulu, joined our team in September last year.

They and our stalwart preparator Ms Khokela Camagu have been working up a storm with processing, labelling and boxing our new specimens, as well as venturing into the world of data collection and databasing.

We also welcome Mr Ekhona Ntloko and Ms Rebecca Cawood, our two honours students, each working on a different fossil insect group from our rich Sutherland plant and insect localities.

Mr Ben Kirkaldy and Mr Liaam Davids are Dr Rose Prevec's new MSc students. Ben will be working on both



Left: (Left to right) Sinethemba Maleke, Aviwe Matiwane, Siyasanga Mnciva. **(Middle):** (Clockwise) Aviwe Matiwane, Rose Prevec, and Sydney Moyo. Working on papers at the library. **(Right):** (Left to right) Introducing Ben Kirkaldy with Sydney Moyo.

extant and extinct dragonflies while Liaam will be working on both insects and plant-insect interactions. We are also excited to welcome Dr Sydney Moyo, who has accepted a post-doctoral fellowship at Albany Museum to work on ecological aspects of the Sutherland localities, in conjunction with Rose Prevec.

Because of his background in modelling trophic connections of modern freshwater invertebrates, he hopes to use his knowledge to reconstruct the trophic relationships that occurred within the middle Permian ecosystems at the Sutherland sites.

Ms Aviwe Matiwane is well into her Ph.D study of *Glossopteris* leaf morphology, and is doing a great job of maintaining our social media presence. The whole team aims to attend the 20th biennial PSSA conference, hosted in Bloemfontein in July – we hope to see you there!

Bonjour! Molweni! French and South African adventures in Sutherland

By Aviwe Matiwane and Rose Prevec
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Left: (Anticlockwise)
Aviwe Matiwane,
Sinethemba Maleke,
Khokela Camagu, Romain
Garrouste. Raining or not,
we work!

Right: The arrival of
Romain created so much
excitement! Even our
colleagues from the
Department of Fresh Water
Invertebrates were interested
in all the fossil creatures he
was identifying from the
Sutherland sites.

Last year in October, the Albany Museum team embarked on a week-long field trip to the Onder Karoo. The team consisted of Dr Rose Prevec, Aviwe Matiwane, Khokela Camagu, Sinethemba Maleke, and our wonderful French friend and colleague, Dr Romain Garrouste, who visited on behalf of famed palaeoentomologist Prof. André Nel. Romain and André are from the Department of Systematics and Evolution at the Museum of Natural History in Paris, and lecture at the Pierre and Marie Currie University.



Romain came to South Africa to work with Dr Rose Prevec and her students on the amazing new insect collection housed at the Albany Museum and to see, first hand, our phenomenal plant and insect fossil site near Sutherland.

We spent the week at the outcrop and exploring the area for new sites. Two new sites, with fossil plants, were discovered close to our main outcrop. These were exciting discoveries for the team but our trip was cut short because of heavy rains that persisted for a few days. Our insect fossil collection continues to grow, with spectacular discoveries. This year, in May, our expanded team will be visiting our amazing fossil sites again. Keep your eye on our Facebook* and Instagram (@palaeo_botanists) pages, where we will be posting some of our activities and fossil discoveries during the field trip. Adventure awaits!!

Albany Museum Devonian Ecosystems project

By Rob Gess

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Above: Rob and Per mourning the victims of the end Devonian extinction.

Through the support of the Albany Museum, The South African CoE in Palaeontology and the Millenium Trust, the Devonian ecosystems project has had a good year. The Albany Museum has made available the entire basement of a historic building in its possession for curation and research of Late Devonian material. Between January and March, with the assistance in February and

March of Mr Bayanda Sonamzi and Mr Dustan Isaacs, from the Albany Museum, the entire Waterloo Farm collection, together with other Devonian collections made by myself and Mr Chris Harris, were moved to the new repository. This was an enormous undertaking and for the first time united the entire collection under one roof. This is being gradually sorted, rehoused in cabinets and purpose made boxes, and catalogued. Weekly additions to the collection are also trickling in from the Waterloo Farm rock sheds and occasionally from other sources.

Chris Harris is back this year after completing a combined palaeontology/geology Honours at Wits last year. Thanks to the Millenian Trust we can offer him a stipend to continue with his researches on the Coombs Hill site, as well as helping with my projects and with wrestling the collection into order.

The new facility has already enjoyed two international visitors. Dr Per Ahlberg of Upsalla University in Sweden visited Grahamstown to do collaborative research with Rob between the 14th and 30th October. Watch this space for some exciting developments.

Right: Chris Harris sorting lingulid brachiopods from Rabbit Ridge in the new Devonian store.



Frank Scholtz from Freiburg University, Germany visited later in October to continue with his collaboration on early non-marine bivalves. He carried out systematic analysis of about 200 bivalves from Waterloo Farm in order to provide a formal species level description of *Naidaites* form Devonica. He also identified 2 further species of bivalve in the collection. More on these later. Since the *Dwykaselachus* paper reported on at the beginning of last year we have two papers in print. These are: 1) Scholtz, S., Gess, R.W. (2017) Oldest known naiaditid bivalve from the high-latitude Late Devonian (Famennian) of South Africa offers clues to survival strategies following the Hangenberg mass extinction. *Palaeogeography, Palaeoclimatology, Palaeoecology*: 471: 31–39.

This paper highlights the presence at Late Devonian high palaeolatitudes of types of bivalve that only appear at low palaeolatitudes (in Europe and North America) following the end Devonian Extinction. As vast global cooling was a characteristic of this pivotal extinction event the apparent relocation of these bivalves to more tropical regions is postulated to have been a survival strategy according to which taxa following their preferred temperature range towards the equator. This novel theory of an extinction event survival strategy may have wide reaching implications for understanding the sudden appearance of post-extinction taxa in regions without a record of their origination.

2) Gess, R.W. and Trinajstić, K.M. (2017) New morphological information on, and species of placoderm fish *Africanaspis* (Arthrodira, Placodermi) from the Late Devonian of South Africa. *PLoS ONE* 12(4): e0173169.



Left: Dr Frank Scholtz photographing Waterloo bivalves, such as *Naidites* form Devonica (inset). A sprig of *Kowieria* from Waterloo Farm.

This paper included a description of a new armour plated fish species, *Africanaspis edmountaini*. It provides an entirely revised description of the type species of *Africanaspis*, *Africanaspis doryssa*, and also previously described from Waterloo Farm. Placoderm fish, which went entirely extinct at the end of the Devonian Period are largely known from their durable head and trunk armour. This paper provides rare evidence regarding the structure of the unarmoured parts of the body, and also provides information on the lifecycle of this group.

A third paper will be in print this month. It is: Gess, R.W. and Prestianni, C. (2018) *Kowieria alveoformis* gen. nov. sp. nov., a new heterosporous lycophyte from the Latest Devonian of Southern Africa. *Review of Palaeobotany and Palynology*: 249:1-8.



Left (top): partial specimen of *Africanaspis doryssa* from Waterloo Farm. **Left (bottom):** *Africanaspis doryssa* in front *A. edmountaini* at back artwork by Anton Brink. **Right:** Rob paying homage to the purported oldest tetrapod trackways - located in Poland.

This new genus and species exhibits a combination of features suggesting that it is a rare example of a lycopod taxon that is basal to the family tree of rhizomorphic (tree-like) lycopods which radiated during the following Carboniferous Period.

In July I attended the 14th International Symposium on Early and Lower Vertebrates in Poland, and presented a spoken paper entitled, “Estuarine fish breeding grounds: a comparison of the Famennian aged Waterloo Farm lagerstätten and contemporary systems.” The paper was well received and the abstract was published in Special

Issue 13 of Ichthyolith Issues. It was really valuable to network with international colleagues and to catch up with the latest ideas and developments on the Early Vertebrates front. Amongst the short fieldtrips was a visit to the oldest purported tetrapod trackways in the world – which substantially predate tetrapod body fossils.

In October Chris Harris attended 2nd International Conference of Continental Ichnology held in Cape Town which he found really rewarding and educational. The abstract of his presentation, “A trace fossil assemblage from ‘lingulid mud beds’ in the Upper Devonian Witpoort Formation, Witteberg Group, South Africa” by C. Harris and, R.W. Gess, is to be published in Palaeontologia Africana.

Otherwise, everything is continuing to roll forward in a really positive way. A few talks, media and a popular article have helped to increase public awareness of our fascinating Devonian heritage. It was good to have a display as part of the CoE display at Scifest in Grahamstown and Dr Ian McKay from the ESI has asked us to build on the initiative this year Dr Anusuya Chinsamy-Turan’s Futurelearn online course, “Extinctions PAST and Present” was a huge success and we were privileged to have a chunk on Waterloo Farm included.

SANRAL’s roadside display/picnic area east of Grahamstown continues crawling towards it’s birth and Maggie Newman has agreed to produce some of her excellent ecological reconstructions to be exhibited on the envisaged signboards.

2018 is already looking to be another exciting and productive year.

Dinosaur Eggs and Babies Symposium 2017

By Kimberley Chapelle
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Above: A picture of me with conference organisers Miguel Moreno-Azanza and Octávio Mateus.

I was lucky enough to present my research at the 6th Dinosaur Eggs and Babies Symposium in Costa de Caparica, Portugal. Caparica is a little beach town a few kilometres south of Lisbon, on the other side of the Tejo River. It was a jam packed and unforgettable few days. We started with an icebreaker party at the Museu Geologico de Lisboa, on Tuesday the 3rd of October.



Above: One of the egg sites on the Jurassic coast of Portugal.

This well hidden museum is housed in a former convent that was built over 150 years ago. As if the history of the building wasn't enough, the museum consists of over 4000 fossils, artefacts, rocks and minerals! A real treat for anyone in our field. The next morning, the two-day long meeting started at the Faculty of Science and Technology, Universidade Nova de Lisboa. It was two full days of talks on everything about eggs (both fossil and extant): egg shell morphology, nest taphonomy, embryonic anatomy, incubation and much more!

It was an eye opening few days and really allowed me to think more about my project and how to take it further. My talk on "Studying some of the world's oldest known dinosaurian embryos using synchrotron microtomography" won best presentation at the conference, which was a real privilege. After the meeting, we had a two-day field trip planned. The first day took us to the Jurassic Coast of Portugal, near Lourinhã.

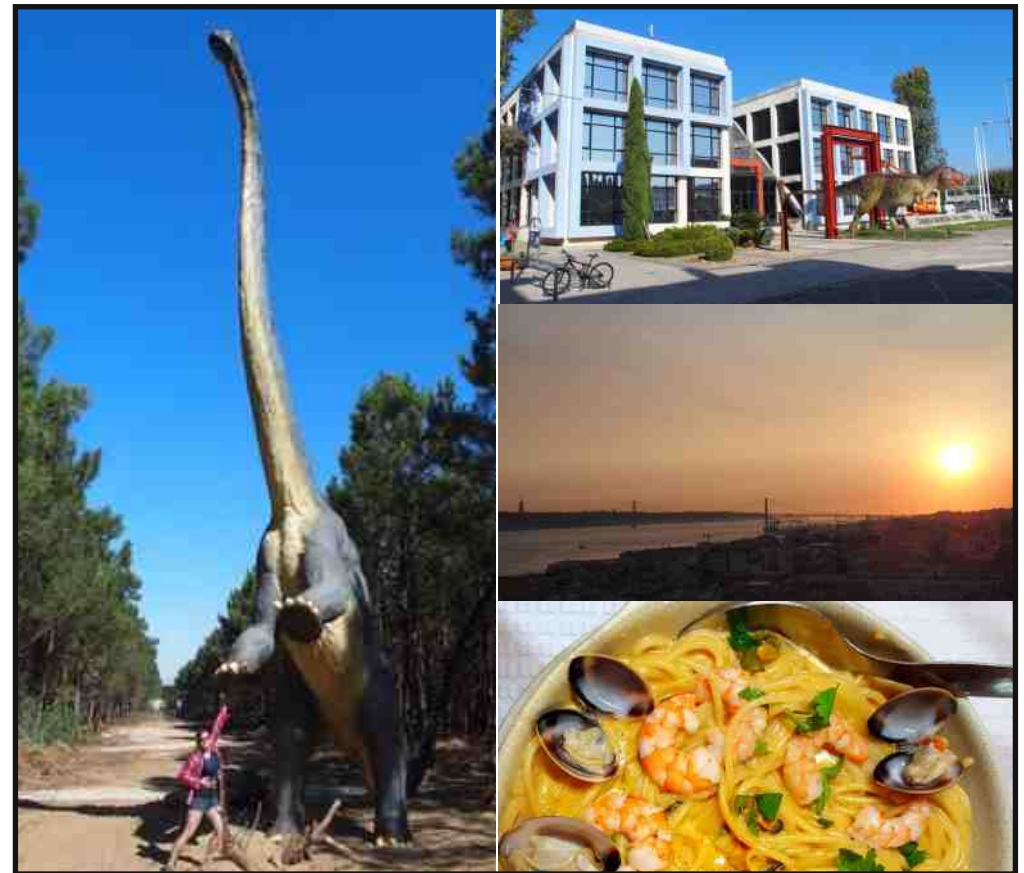
We visited several nesting and footprint sites along the coast, including the first dinosaur egg site discovered in Portugal.

This find made Lourinhã a real dinosaur town: there are dinosaurs at the traffic circles, dinosaurs in the paving of the sidewalks, dinosaurs on the buses, dinosaur reconstructions scattered throughout the town (including in front of the Municipality) and of course the Lourinhã Museum! A dinosaur nerd's wonderland.

We were also given a sneak peak tour of the Dinosaur Park of Lourinhã, opening in 2018. In this park, you get to walk along a several kilometre-long trail and discover life size reconstructions of all sorts palaeontological creatures, including a life size sauropod that I got to high-five (because why wouldn't you?).

The last day of the meeting took us to Lisbon Natural and Earth Sciences Museums which is also filled with some wonderful exhibits on palaeontology and famous Portuguese biologists. I met a lot of great interesting people at this meeting and I managed to grab a few days before and after the meeting to do some sightseeing in Lisbon. I highly recommend it to anyone.

It is a fantastic destination and one I hope to see more of some day!



Left: High-fiving a life size sauropod! **Right (top):** Lourinhã dinosaur in front of the Municipality. **Right (middle):** Lisbon at sunset, the other side of the bridge is Costa de Caparica. **Right (bottom):** One of the many great things about Lisbon is the food!

ESI Dino Lab Visit to IVPP, Beijing

By Kathleen Dollman

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In October 2017, members from the Dino Lab from the Evolutionary Studies Institute (ESI) travelled to Beijing to visit the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) to pay a visit to their spectacular fossil collection. The team included the Lab leader Jonah Choiniere and his students Kimi Chapelle, Cory Dinter and myself, Kathleen Dollman. This visit was the final year of a joint grant through the NRF IRG programme between the ESI (Jonah Choiniere and Fernando Abdala) and the IVPP (Liu Jun, Xu Xing). Parties from both sides have had the opportunity to visit each other's institutions which has resulted in prosperous fieldwork, much drooling over fossils and a fair number of photos that are best left in the past. On our first day at the IVPP we were introduced to Xu Xing. His office is hard to focus in as every surface is covered with pristine slab specimens from throughout China.

After which, we made our way to the collections and were introduced to the fossils we would be spending the next few days getting to know, including the Early Cretaceous theropod *Tugulusaurus*, sauropodomorphs *Lufengosaurus*, *Gypsosaurus*, *Sanpasaurus*, along with numerous crocodylomorphs including the iconic *Junggarsuchus*. The IVPP has grown to spread out over two neighboring buildings. Sometimes this setup would require careful moving of the fossils on a precarious trolley from one building to the next along the busy streets of China, with the occasional strange stares from passers by.

As the week progressed each member of the team had their own adventure. Kimi, Jonah and Cory travelled to Tianjin to view a few massive sauropodomorphs, a trip made even more exciting by a ride on the bullet train. Later in the week, Kimi and Cory also made the long trek to the satellite facility Xiaotangshang to investigate further the sauropodomorphs of China. The size of the specimens required them to forklift the containers outside the warehouse, and for them to study the specimens under the Beijing skyline. I spent most of my week standing on a chair trying to understand a particularly problematic crocodylomorph specimen, accompanied by Jonah who looked quite pleased with himself being seated on the floor surrounded by fossils

During the course of the week we were warmly hosted by Jingmai O'Connor and Corwin Sullivan (now holding the Philip J. Currie professorship at the University of Alberta). Since our previous visit in 2016 Beijing has changed a lot, the street vendors and the famous bar-filled, narrow alleyways of the Hutongs had been cleaned up almost to the point that they were unrecognizable. However, our enthusiastic hosts together with Jingmai's sister Yingmai.



and her sturdy moped managed to sniff out the best spots Beijing had to offer. A highlight was the China VS RSA bow and arrow fight in a games centre. China beat RSA, but not without us giving them a run for their money. The week culminated in a big dinner at a Mongolian restaurant, Ninety-Nine Yurts. The yurt is a traditional Mongolian hut-like structure. Inside this massive yurt we were all seated around a table where we ate traditional Mongolian side dishes together with a spit-braai'ed goat.

As with most collection visits, the last day consisted of us scrambling to wring the last bit of information that we could from each of our studied specimens. Understanding everything about the IVPP specimens is an almost impossible task given the number, quality and variety of fossils. Upon realization of this fact we sat back, cheered our Tsingtao beers to a job well done with the hope that one day we can come back to the crazy, beautiful, strange place that is China.

A Birmingham-Dino Lab trip to the Cynognathus AZ

By Pia Viglietti
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The ESI Dino Lab, lead by Prof. Jonah Choniere, joined the University of Birmingham's research lab (lead by Prof. Richard Butler) on a joint collaboration to investigate the *Cynognathus* C zone in November 2017. Joining the trip from the ESI was myself, and new lab member Dr James Neenan, who was about to embark on his first ever field work. From the Birmingham side were four of Richard's PhD students (Ms Emma Dunne, Mr Daniel Cashmore, Mr Pedro Gody, and Mr Andrew Jones) who were taking part in their first ever field work in South Africa.

The first stop on the trip was Thaba Thala Game Farm near Sterkstroom. This is the stomping ground of Dr John Hancox, who has spent many years working to understand the lateral extent of the *Cynognathus* AZ (Beaufort Group). John joined us for a few days along with Dr Emese Bordy from the University of Cape Town. The *Cynognathus* C zone is the uppermost section of the biozone, and is the least laterally extensive. It is also the least fossiliferous, but stratigraphically these late Middle Triassic deposits should harbour some of the oldest dinosaur line archosaurs and mammiliformes. While measuring a section and collecting dating samples, Jonah found an intriguing chunk of bone, which turned out to be



Clockwise: Puny morsels from the *Cynognathus* C zone. Dr Neenan meets the rock saw. Jonah after realising he sliced the fossil, oops! A trip down section meant finding behemoths like this Kannemeyeriid skull. The Birmingham lab sans Richard from left to right, Andrew Jones wearing his formiddable snake armour, Daniel Cashmore, Pedro Gody, and Emma Dunne.

a skull of *Angonisauros*. This was discovered after the tip of the skull was accidentally sliced off by the rock saw! But this was nothing a bit of glue couldn't fix, and James and Jonah made quick work getting it out with the rock saw. A few other finds were also made, but the jury is still out on what they are as they are mainly incomplete. On our last day in the area, we drove down section to the B zone where prospecting was very rich, and everyone came home finding at least one fossil, which was a major boost to moral for all the team involved.



Left to right: The team posed next to a large fossil tree trunk in the Molteno Formation. We had moved to near Lady Grey where locals Mr James Ralane (2nd on right), Mr Themba Jikajika (right top), and Mr David Mei (far right) gave us a tour of the fossil riches their town had to offer, and we were not dissatisfied! Jonah and Richard take a closer look at some of the fossil riches uncovered. Yours truly taking a field selfie next to a fossil being investigated by the field team. Jonah gesturing towards one of many partially articulated skeletons littered over a wide danga system in the Lower Elliot Formation.

For the last leg of the trip, the team moved up section into the Elliot Formation to a site near Lady Grey which was brought to our attention by Lady Grey local, Mr Mei who works in the local municipality. He took us to the local dinosaur man, a man called Mr James Ralane, who invited us over for lunch in his home and showed us his many fossil, geological, and archaeological curiosities. We then followed James a couple hundred metres from his house on foot where we were met with one of the richest fossil sites many of us have ever seen.

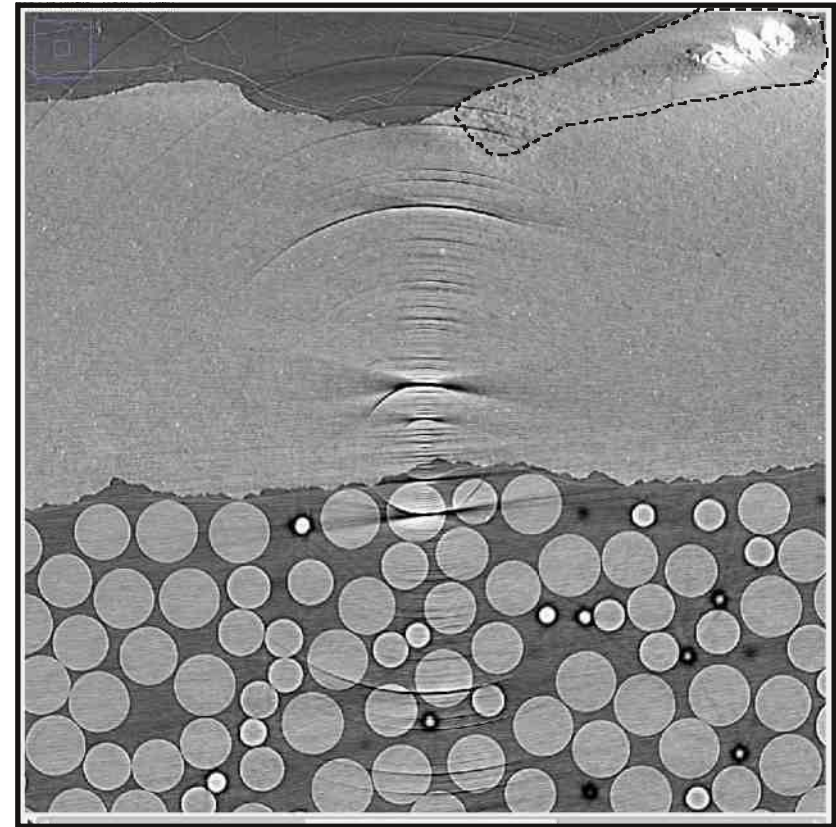
In a large danga system were the fossilised skeletons of multiple individuals. Most appear to be large sauropodomorph dinosaurs. We hope to return in the next year, and should be able to tell you more after that point, so watch this space! That evening there was much celebration. A cocktail was invented (see the Recipe Corner), and "stryf-dops" were enjoyed by the crew, the effects of which were certainly felt the next day on the drive back home. What we all cannot wait for is our return to uncover this new site, which should be the focus of research for a few years to come!

One shade of Grey

By Viktor Radermacher
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Holy *Kannemeyeria*. This was the moment, year, and department I had been waiting ages for. From volunteering part-time during the ol' "BPI" days, to actually enrolling as a student was a sublime enough feeling to justify the arduous journey here. Joining the ESI was a homecoming. I finally got to leave the fluff of undergrad in the dirt and sink my teeth into something solid. Speaking of teeth, I was privileged enough to work on one of my favourite critters from my favourite batch of dinosaurs; the different-toothed-lizard, *Heterodontosaurus*. And not only did I work on the physical specimen, but this little rock star was also scanned at the ESRF Synchrotron giving me unprecedented access to its deeper postcranial secrets. Our lexicon has yet to birth a word or phrase that sufficiently relays my level of gratitude for the opportunity to work on this specimen (Thank you so much Jonah, Billy, Rose, and Vincent).

Processing and digitally prying the fossil from the matrix would prove to be tougher than any of us anticipated. The iron that gives the Elliot Formation its characteristic crimson encrusted the fossil giving it a very similar density to the rock. This meant that the micro-CT scans produced by the ESRF Synchrotron were a hazy grey, with tiny ferric inclusions complicating matters further giving the scans the appearance of static on old box TVs. There was very little difference between rock and bone. However, Vincent Fernandez earned his new official title



Above: One slice of the micro-CT data. Bone is outlined. Small circles are aluminium balls used to increase density in a particularly thin plane of the specimen.

of Grand Techno-Wizard by conjuring writing a spell program that smoothed the results by removing inclusions and slightly sharpening the interface between rock and bone. This was not enough magic to make the segmentation process automatic (that would require the sacrifice of exactly one Giant Dassie but we couldn't get the ethical clearance despite multiple appeals) but it was just enough to see that I could salvage a project that at one point looked impossible to achieve if I was still to tend to classes, essays, exams, etc.

I segmented all of the anatomy required for the project (and a few more other happy surprises) by going through the files slice by slice and gradually building up beautiful 3D models that can tell us something. This was the largest fossil ever scanned at the ESRF – a fact evidenced by the sheer number of images produced as well as the toll it took on the high-performance PCs at the ESI.

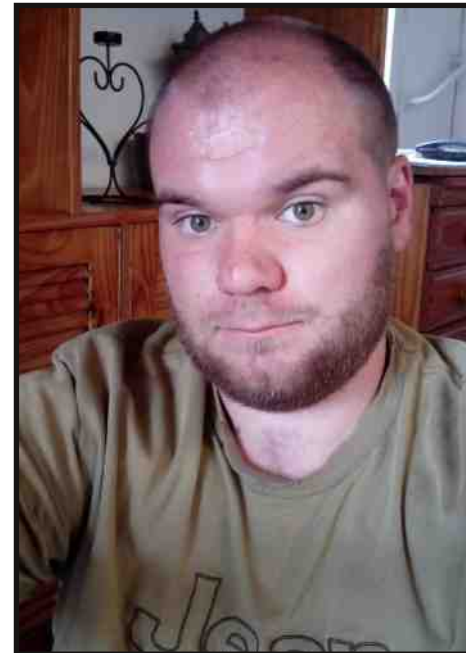
The programs would often lag or outright crash, erasing hours' worth of work, consequently sending colourful new cuss words echoing through the empty department during late night marathons. Julien Benoit would sing the Terminator theme tune and call me "The Segmentator", remarking that I am "a machine sent from the future to segment the cr*p out of everything". That's a damn bad ass title and I wear it with pride.

I get the feeling that it might sound like I'm complaining. But I'm not. But I'm not going to wax any cheesy motivational quotes here either. It was damn hard producing results that looked like something and that I could use. Even harder still doing this in between classes. But I kept gunning it because what I was finding was just too damn perplexing and curious to do to a half-hearted effort.

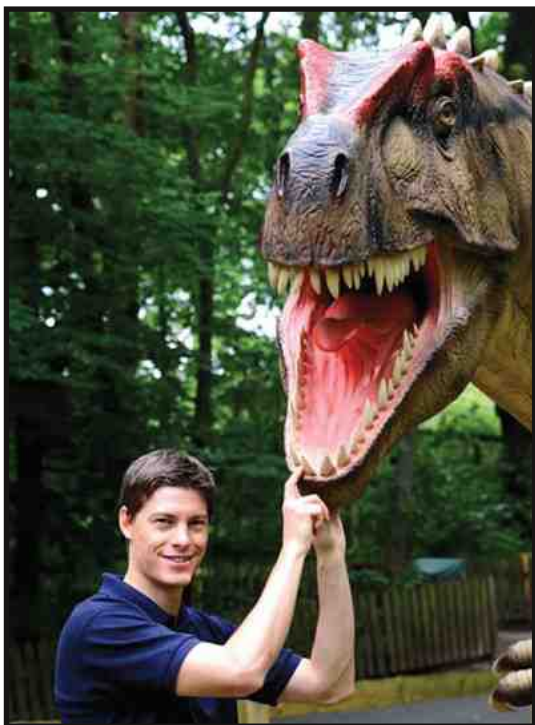
More often than any scientist would care to admit, myself, Kimi Chapelle, and Jonah Choiniere would very often just shrug when looking at the reconstructions and say "Yeah... I dunno what the hell that is" or the perennial favourite "Yip, that's definitely a thing". Heterodontosaurus is a gift that just keeps on giving... and I was grateful for every oddity it gifted.

Fuelled by the thrill of discovery, the pull of curiosity, and many, many energy drinks later I finally built up a 3D model that I could confidently start identifying and describing anatomy from. I then reconstructed a hypothetical model seeking to explore what some of these new features were doing physiologically, as well as where these features optimise on dinosaur phylogenetic trees. But you'll have to wait for our publication, and/or attend my poster or presentation at this year's PSSA conference to see those truly exciting results! I hope to meet you all soon.

Other Bone Lab News



Rick Tolchard completed his BSc (Honours) in the field of Palaeontology under the supervision of Professor Jonah Choiniere. For his research report, he examined a cynodont fossil from *Cynognathus* Subzone C. His results show the material to represent a new taxon and the largest non-mammalian cynodont yet discovered. He is now pursuing his MSc degree.



Dr. Christophe Hendrickx, a postdoctoral fellow supervised by Prof. Jonah Choiniere and Prof. Fernando Abdala, was recently awarded a third postdoctoral fellowship at the ESI for the year 2018.

This funding, provided by the Research Committee of the University of the Witwatersrand, will enable him to pursue his research on the evolution of the dentition in theropod dinosaurs and gomphodont cynodonts. Theropods, the

group of dinosaurs that gave rise to birds, include all flesh-eating dinosaurs, yet many theropod groups close to birds were in fact omnivorous and herbivorous.

Consequently, the dentition of theropods shows a large diversity of morphology, from the blade shape teeth bore by the Velociraptor, to the banana-like crowns of the *Tyrannosaurus*, the conical teeth of the fish-eating *Baryonyx* and the needle like teeth of some parrot-like theropods like *Caudipteryx*. Christophe wishes to explore the distribution of dental features such as the presence of denticles on the crown of the different species of theropods.

He also intends to quantify the amount of morphological diversity, known as ‘disparity’, in the dentition of

theropods throughout their evolution in the Mesozoic, to see if there is any correlation between this dental disparity and the emergence of flowering plants in the Cretaceous, for instance.

Christophe is also interested in the teeth of gomphodont cynodonts, a radiation of dog-like mammalian reptiles from the Triassic and the close cousins of the ancestors of mammals. Like other cynodonts, gomphodonts were heterodont animals as their teeth were differentiated into incisors, canines and postcanines. However, unlike most other cynodonts, gomphodonts were partially to exclusively herbivorous and bore wide ovoid-shape postcanines allowing them to chew hard plant material.

Likewise, unlike theropods and dinosaurs in general, the teeth of gomphodont cynodonts were particularly complex and show many bumps, crests and concavities on their surface. Christophe also wishes to investigate the evolution of the dentition in gomphodonts and to quantify the amount of morphological difference in the teeth of these animals throughout their evolution in the Triassic.

With his third postdoctoral fellowship, Christophe will be able to publish several papers on the subject in particularly high ranking journals.

Goodbye Cory!

By Cory Dinter
Evolutionary Studies Institute, Wits University
cm.dinter@gmail.com

Hey South Africa paleontologists, it's been a tremendous two years! I'm sad to go but it's been an absolute pleasure getting to know you all and I'm going to miss you a whole bunch! Thank you for the adventures, the knowledge and experience, and all the tasty wine! If you're out Utah way, be sure to drop me a line!.



A visit from Paul Barrett

By Jonah Choiniere
Evolutionary Studies Institute, Wits University
jonah.choiniere@wits.ac.za

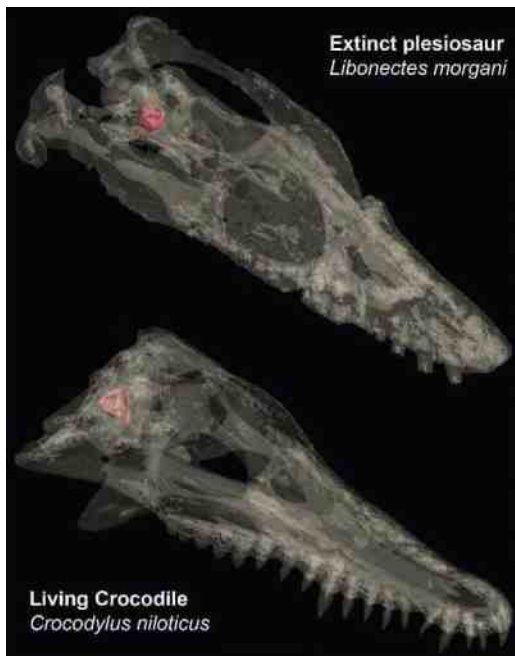
In early December, Prof Paul Barrett of the Natural History Museum, London, paid a visit to the ESI for a week on the homology farm with the neotype specimen of *Massospondylus carinatus*, or as we affectionately call her, Big Momma.

Earlier in 2017, Charlton Dube, Sifelani Jirah, Bernhard Zipfel, and Mark Graham of the NHM put the prep lab through an intensive training course in archival housings and conservation as part of a two-year project to conserve and remount the specimen for public display in the ESI. Prof Barrett's research, done in collaboration with Kimi Chapelle, Casey Staunton, and Jonah Choiniere was the final step in this process.

The team will soon be submitting their monograph for publication, and Big Momma will be rejoining us on the ground floor!

It's all in the ears: Sauropterygian inner ears mirror those of recent aquatic reptiles

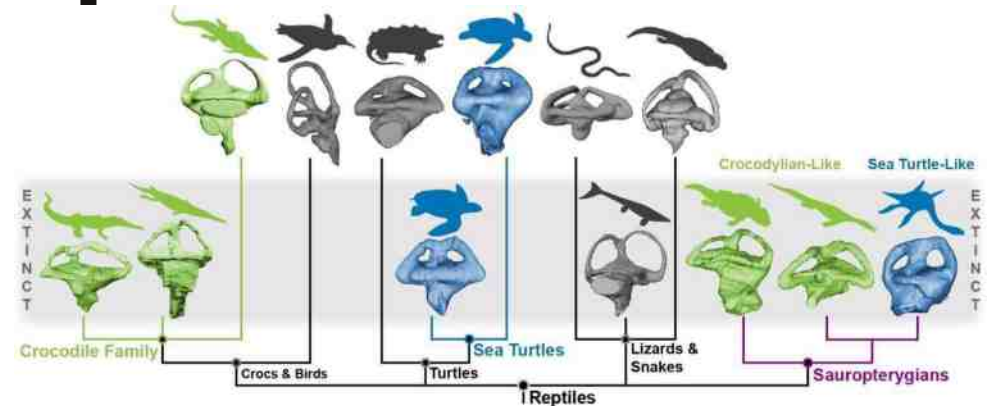
By James Neenan
Evolutionary Studies Institute, Wits University
james.neenan@wits.ac.za



Above: Transparent skulls of an extinct plesiosaur (top) and a living crocodile (bottom). The inner ear is the pink structure towards the back of the head.

Sauropterygians were marine reptiles that dominated aquatic ecosystems throughout the Mesozoic that included semi-aquatic forms, nearshore swimmers and fully-aquatic ‘underwater-flyers’.

Their most famous members are the plesiosaurs, four-flippered hunting machines that snared anything from small fish and squid to other marine reptiles. The inner ear contains an important sense organ that helps all vertebrates to stay balanced and orientated (left). It is particularly interesting in aquatic animals as they live in a three-dimensional environment, so have different sensory inputs



Above: Sauropterygians had inner ears that closely resembled members of the crocodile family (green) or sea turtles (blue), which also share similar lifestyles and swimming modes. Semi-aquatic sauropterygians with jointed limbs had similar lifestyles to crocodiles. The fully-aquatic plesiosaurs had flippers, much like sea turtles, and have similar shaped inner ears.

compared to those that live on land. It is therefore very useful for detecting differences in locomotion in extinct animals, especially when compared to those of living organisms.

After scanning skulls from a range of sauropterygian taxa that span all major habitats and morphologies, we used geometric morphometrics to quantify shape changes between the semicircular canals. We were surprised to find a significant difference in canal geometries between semi-aquatic/nearshore taxa and the obligate aquatic, flippered plesiosaurs. Indeed, the former had inner ears

that resemble those of modern crocs and the latter to those of sea turtles (previous page). This indicates that lifestyle and swimming mode have a distinct influence on inner ear geometry and appears to have at least some degree of convergence between unrelated saurian clades.

The similarities don't end there, though. At least twice in sauropterygian phylogeny, plesiosaurs with enormous heads and very short necks evolved independently (i.e. pliosaurs and polycotylids). These 'pliosauromorphs' share a very similar bauplan with modern whales, which have the unusual feature of having highly miniaturized inner ears (blue whales have a similar-sized inner ear to humans!). Our results also show that 'pliosauromorphs' share this reduced inner ear, which appears to be another example of convergence in this organ.

As the new 'ear guy at the ESI', my research focus at Wits will now move onto some of the spectacular southern African reptile material that is available here: namely dinosaurs and early crocs. If you're interested in reading some more about sauropterygian ears, you can find it here:

Neenan JM, Reich T, Evers S, Druckenmiller PS, Voeten DFAE, Choiniere JN, Barrett PM, Pierce SE & Benson RBJ. 2017. Evolution of the sauropterygian labyrinth with increasingly pelagic lifestyles. *Current Biology*, 27(24): 3852–3858. doi: 10.1016/j.cub.2017.10.069.

Homeward bound

By Michael Day

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The last few months have seen me mostly writing and stressing over reference list formatting, but I did find time to attend the annual meeting of the Palaeontological Association in London in December, talking a bit about the work I am undertaking with Bruce Rubidge, Fernando Abdala, Andrey Sennikov and Valeriy Golubev drawing comparisons between the Permian vertebrate successions in South Africa and Russia. Just a week ago, I was able to visit the collections of the McGregor Museum in Kimberley to create a comprehensive digital catalogue of their Karoo fossils, as well as become friendly with the new resident spitting cobra.

But these are small potatoes compared to other developments. Alas, after more than 8 years in South Africa, and over 38 weeks cumulatively spent in Great Karoo, it is with both excitement and sorrow that I must announce that I will be leaving these southern lands for the north: more specifically, to take up a position as curator of non-mammalian tetrapods at the Natural History Museum in London.

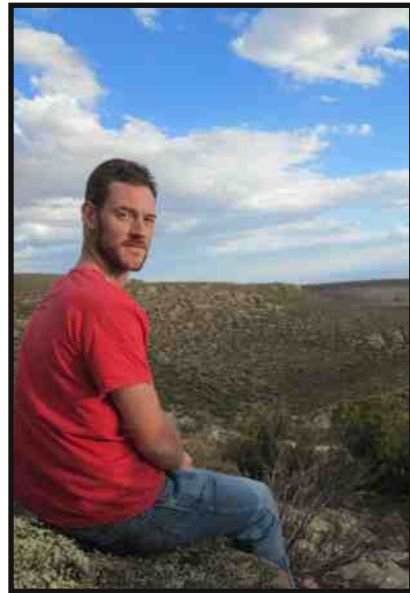
Though many thousands of kilometres away, I will not, however, be far from the Karoo, for one of my duties will be to look after the collection of South African therapsids sent to London in the 19th and early 20th Centuries. It is some comfort to know that I will still be able to keep the company of *Tapinocephalus*, *Titanosuchus* and their kin.

If you take this to mean that my work in South Africa has similarly come to an end, then you are gravely mistaken; Bruce won't let me off the hook as easily as that. I will be back to visit as often as is feasible and you may yet find me out in the veld between the Swartberg Mountains and Nuweveld, sweating and panting, and on the hunt for long extinct creatures.

I would like to take this opportunity to thank the members of the South African palaeontological community and the PSSA for their friendship and support. I have had a fantastic time working with many of you and being part of such a vibrant and friendly group of people. Please keep it up. And, of course, if you find yourself in London, then please look me up and I will endeavour to take you out for a fine English ale. Only £6 a pint.



Remember me as I was...



...not as I was when posing for photographs.

CoE Pal Public Engagement

By Ian McKay

Evolutionary Studies Institute, Wits University
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The CoE Pal Outreach Initiative had an awesome but incredibly busy time last year and we could fill a whole news-letter of our own describing all our activities. The highlights are that we had a travelling exhibition called the Maze of Time which reached 152 000 people at the Grahamstown Science Festival, Rand Show and Wits Yebo Gogga Exhibition. We also presented a hands-on workshop on human evolution and fire making, beadwork and the use of stone age technology in Grahamstown. We are proud to announce that we won the award for the best exhibit and curriculum related workshop at the festival.

To add a twist to the outreach, we are adding a research component by testing the Hands on Human Evolution workshop around the country with the assistance of CoE partners in the Albany Museum, Iziko Museum of Natural History and West Coast Fossil Park. With the help of Dr Wendy Taylor and Dr Thalassa Matthews, we hope to have an online version.

Then we organised National Science Week on behalf of Wits, with a palaeoscience twist of course. We were at the official opening in Port Elizabeth, organised tours of the Wits Facilities including the ESI, the Science Slam which was won (against stiff competition from other post grad students at Wits), and of course we had an exhibition and workshop sessions at Sci-Bono Science Centre. New developments in the pipeline are full size reconstruction



of a dinosaur- details of this mystery animal to be revealed, and a poster on human evolution which is in the proof reading stage.

Additionally, the Kitching Fossil Exploration Centre (KFEC) was also a great success with some new exhibits and an audience of 4962 visitors over the year. Also, we have hit the social media so check out our face book sites, there is one for the Centre of Excellence called: Palaeontology for All (<https://www.facebook.com/Palaeo4All/>) and one for the Kitching Fossil Exploration Centre (<https://www.facebook.com/theauthenticfossilplace/>)

To finish thanks so much to all of the palaeoscientists and others who gave so freely of their time and helped with the various programmes. Let's hope we can do something similar in 2018 and win even greater support from the South African Public for palaeontology research in the future.

(Left: top to bottom)

- Prize giving at the Grahamstown Science Festival
- Digging fossils at the KFEC
- Isn't she pretty- face? Face painting with Ochre at the Rand Show
- Who knows what lurks inside the maze of time

From Eohippus that wanted to be a horse; to the Anthropoidal Ape who wanted to be Man; and then to Neolithic man who said he'd become civilised

By Francis Thackeray
Evolutionary Studies Institute, Wits University
francis.thackeray@wits.ac.za

This is a poem written by Charlotte Perkins Stetson Gilman. It is presented here in the form of prose, but the rhyme can be recognised. I knew this poem when I was a child in the 1960s (as a budding palaeontologist). It is written with a sense of evolutionary change through time, and it expresses the view that things that are considered by one individual as enterprising and novel, are generally squashed by the ardent critics (cf. the concept of sigma taxonomy, and a probabilistic definition of a species, developed by Thackeray and which is currently being severely criticised, but which may be seen to have merit in ten years's time. Watch this space ! (Statement by Francis Thackeray, 14 January, 2018).

The poem reads as follows.

There was once a little animal, no bigger than a fox, and on five toes he scampered over Tertiary rocks. They called him *Eohippus*, and they called him very small, and they thought him of no value when they thought of him at all. For the lumpish old *Dinoceras* and *Coryphodon* so slow, were the heavy aristocracy in days of long ago. Said the little *Eohippus*, '*I am going to be a horse! And on my middle finger-nails, to run my earthly course! I'm going to have a flowing tail! I'm going to have a mane! I'm going to stand fourteen hands high on the psychozoic plain!*' The *Coryphodon* was horrified. The *Dinoceras* was shocked. And they chased young *Eohippus*, but he skipped away

and mocked. And they laughed enormous laughter, and they groaned enormous groans, and they bade young *Eohippus* go view his father's bones. Said they, '*You always were as small and mean as now we see, and that's conclusive evidence that you're always going to be. What! Be a great, tall, handsome beast, with hoofs to gallop on? Why! You'd have to change your nature!*' said the *Loxolophodon*. They considered him disposed of, and retired with gait serene. That was the way they argued in the early Eocene.'

There was once an Anthropoidal Ape, far smarter than the rest, and everything that they could do, he always did the best. So they naturally disliked him, and they gave him shoulders cool, and when they had to mention him, they said he was a fool. Cried this pretentious Ape one day, '*I'm going to be a Man! And stand upright, and hunt, and fight, and conquer all I can! I'm going to cut down forest trees to make my houses higher! I'm going to kill the Mastodon! I'm going to make a fire!*' Loud screamed the Anthropoidal Apes, with laughter wild and gay. They tried to catch that boastful one but he always got away. So they yelled at him in chorus which he minded not a whit. And they pelted him with coconuts which didn't seem to hit. And then they gave him reasons which they thought of much avail, to prove how his preposterous attempt was very sure to fail. Said the sages, '*In the first place, the thing cannot be done! And, second, if it could be, it would not be any fun! And, third, and most conclusive, and admitting no reply, you would have to change your nature! We should like to see you try!*' They chuckled

then triumphantly, these lean and hairy shapes, for these things passed as arguments with the Anthropoidal Apes.

There was once a Neolithic Man, an enterprising wight, who made his chopping implements unusually bright. Unusually clever he, unusually brave, and he drew delightful mammoths on the borders of his cave. To his Neolithic neighbours, who were startled and surprised, said he, *'My friends, in course of time, we shall be civilized! We are going to live in cities! We are going to fight in wars! We are going to eat three times a day without a natural cause! We are going to turn life upside down about a thing called gold! We are going to want the earth, and take as much as we can hold! We are going to wear great piles of stuff outside our proper skins! We are going to have diseases, and accomplishments and sins!'* Then they all rose up in fury against their boastful friend, for prehistoric patience cometh quickly to an end. Said one, *'This is chimerical! Utopian! Absurd!'* Said another, *'What a stupid life! too dull, upon my word...'*. Cried all, *'...before such things can come, you idiotic child'*.

Burrowing and the Present Water Troubles - A Survival Strategy

By Gideon Groenewald
PO Box 2, Clarens
gideonhgroenewald@gmail.com

Following probably one of the most interesting three weeks of looking at trace fossils and tracks of all kinds in the Karoo Sequence during October 2017, I am presently becoming one of the great Burrowers of 2018 myself. So, looking at the past, we can find a key to the present!

During October 2017 we had the opportunity to walk the walks and talk the talks of great names and spend time with great people like Emese Bordy and her International Team of Ichnologists. The experience brought us to the most amazing finds in Lesotho and some good track ways near Prins Albert.



Left: A rocky Froggy in Lesotho. **Right:** Rocky Trackway of an ancient thirsty beast near Prins Albert.

In the interim *Homo sapiens* is also learning to burrow!

During a recent study in the area close to Estcourt in KwaZulu-Natal, we came across the skull of a bloke that did not make it during a dry spell about 250 million years ago, and then during November 2017 I stepped on the skull of another poor soul who succumbed to some sort of illness or purely running out of drinking water near the town.

In our search for groundwater for the town of Beaufort West we discovered a very big (5mx3m) drawing of a White Horse on a cliff, overlooking the town. Nobody knows who draw this picture, but we burrowed our best burrow for water at "Die Witperd se Gat".

Burrowing for water can be a dusty business, but luckily, if you get it right, the burrow spouts some water in the end.

So, in trying to understand why the animals reverted to burrowing in the Palaeontological World, we come to realize that “Burrowing as an Art”, is one of the best ways of surviving the Drought of 2018.

Greetings to all the burrowers and if you by chance do not have a burrow, borrow one soon.

Gideon, Patricia and David (The Burrowers Fandamily).



Left: Skull of the unknown "oukie" from Estcourt in KwaZulu-Natal. **Right:** Burrowing for survival in the Karoo.



Left: The White Horse of the Karoo. **Middle:** Burrowing is a Dusty Business of ‘Vasbyt’ **Right:** Burrowing for survival in the Karoo. Burrowing Pleasures in the Great Karoo!

Africa Alive Corridors

A transdisciplinary biography of the mother continent told along 20 corridors



"For the children of today to inherit the richness of tomorrow's world"
—Nelson Mandela (1998)



"Telling the holistic geological-biological-cultural story of the Mother Continent."
...with everyone as consultants of over 4-billion years of unmatched irreplaceable heritage.
Creating a new tomorrow



Africa's corridors changed the continent's history of our humanity. It is a story of human language, culture, of our genetic diversity, of our shared humanity, of our shared future.

AFRICA: Today is a new way forward. Towards the dignity of all humans. & all other species.

John M Anderson & Maarten de Wit, AACC, South Africa, 9 Jan 2018
Graphic Design: Peter Dries



Newsletter 3

January 2018

Dear Contributors

The coming year, 2018, looms especially significantly in the life of our 'Africa Alive Corridors' initiative. It is the 20th Anniversary of the launching of the mother project, 'Gondwana Alive' at the International Gondwana Symposium in Cape Town (June-July 1998). It is also the 10th anniversary of the 'International Year of Planet Earth' (IYPE) conference in Arusha, Tanzania (May 2008), at which we launched our 'Earth Alive, 101 Strategies Towards Stemming the Sixth Extinction' student card game. And on 18 July 2018, it is the 100th Anniversary of the birth of Nelson Mandela, who enthusiastically endorsed the overall initiative whilst still President of South Africa—"For the children of today's world and the children of tomorrow's world" (Dec 1998).

We are now set to complete our complimentary pair of books, 'Africa Alive Corridors' (AAC) and 'Homo sapiens Corridor' (HSC) by mid-2018, and to have them published through Springer by the end of the year! The timing could hardly be more symbolic!

Whilst the AAC volume tells the overall biography of the continent along 20 selected Heritage Corridors (each with 20 Heritage Nodes); the HSC volume fills out our human story along the 10th of those Corridors, that stretching along the southern Cape coastal region. The opening volume, AAC, will contain the overall aims of the project, as well as a synopsis of each corridor synthesised in 20 pages (50% text and 50% illustrations/graphics).

As spelled out on the accompanying A4 poster, the AAC initiative has two sides to it: firstly, telling the biography of our Mother continent, Corridor by Corridor (chapter by chapter) up through its 4-billion-year epic story; and secondly, drawing in all 1-billion persons living on her soil as proud co-stewards of the unmatched irreplaceable geological, biological, cultural heritage.

Through the following 5 years (2019-2024), we aim to publish volumes on each of the other 19 African Corridors. For these we will be seeking home-based editors, persons living along or within the vicinity of the Corridor. Also, we will be producing a concluding 'Out of and into Africa' volume covering the various episodes of colonisation out of the continent, and the subsequent re-colonisation of Africa from abroad.

We thank you greatly for your participation as contributing co-authors to this project.

John M Anderson: The Amphitheatre, Pretoria
Maarten de Wit: Aeon-ESRI, Nelson Mandela Univ., Port Elizabeth
January 2018



Africa Alive Corridors

(A transdisciplinary biography told along 20 Corridors)

CONTENTS (520pp)

Introduction (110pp)

- Why Corridors? Why Africa? (8pp)
- Anthropocene (The Sixth Extinction) (8pp)
- "Half Earth"
- Context: Earth, Gondwana, Africa (4pp)
- Heritage corridors & catchment areas: concept, aims (4pp)
- Heritage nodes, satellite nodes (4pp)
- Themes: geological, biological, cultural (4pp)
- Climate change (14pp)
- We are not alone (50pp)
 - Elephants, Big cats, Whales, Apes, Ants
- A global petition (14pp)
- Out of & Into Africa (4pp)



"For the children of today's world and the children of tomorrow's world"
—Nelson Mandela (1999)
(from endorsement to this initiative)

The 20 Corridors

	Co-ordinators	Principal contributors/authors
1. Cradle to Cradle	MdeW, JMA	Maarten de Wit & John Anderson
2. Snowball Earth	MdeW	Paul Hoffman, Doug Erwin, Roy Mcg. Miller, **
3. Great Karoo	JMA	Bruce Rubidge, J. Anderson, Roger Smith, Bastien Linol, Emise Brodie
4. Cameroon Pole of Rotation	MdeW	Felix Toteu, Judith Masters
5. Atlas Colliding Continents	MdeW, JMA	MdeW, Francois Guillocheau, Linstadter
6. Lemur-Dodo	MdeW	Hajarimanitra Rambeloarivony, J. Masters, Ronadh Cox, Rose Boswell
7. Lungs of Africa	MdeW	Woody Cotterill, Bastien Linol, Judith Masters
8. Eastern Rift Valley	MdeW, JMA	Andrew Cohen, Asfawossen Asrat, Charles Musita, Janet Purdy
9. Western Rift Valley	MdeW	Charles Kazanjo, Woody Cotterill, Chris Scholz
10. Homo sapiens	JMA	editors (JMA & MdeW) & over 50 co-contributors
11. Khoisan Kalahari	JMA	Chis Low (Ikhwat), Pippa Skotnes, Ian McCallum
12. Saharan Paradise Lost	MdeW, JMA	David Coulson, Sharad Master, Francois Guillocheau, Heinz Rutter
13. Valley of the Pharaohs	MdeW	Ona Viljoen, Safiya Mohammed-Hassan, Cornelia Kleinitz
14. Abasynnian Highlands	MdeW	Asfawossen Asrat, Helen Epstein
15. Songhay's Timbuktu	MdeW	Moutar Doucoure, Ousmane Bamba, Tim Insoll, Natalie Swanepoel
16. Mapungubwe-Zimbabwe	MdeW, JMA	(Curator of museum), Tom Hufmann, Jane Camuthers, Simon Hall
17. The Slave Trade	MdeW, JMA	Natalie Swanepoel, Barpougouni Mardjoua, Heinz Rutter
18. Zambezi River	MdeW, JMA	Imasiku Nyambe, W. Cotterill, Andy Moore, Frank Eckardt, Mike de Wit
19. Carbon Footprint	MdeW	Moutar Doucoure, Francois Guillocheau
20. Sixth Extinction	MdeW, JMA	Seife Berhe, Moutar Doucoure, Helen Epstein

(400pp; 20 chapters of 20pp each)

** (contributor to be added; others who are especially eager to contribute should please contact us)

We are not alone: Elephants (Norman Owen-Smith), Big cats (Colin Garland *et al.*), Whales (Stephanie Plon), Primates (Judith Masters), Ants (Natasha Mothapo)

References, Glossary, Index (10pp)

John M Anderson (Amphitheatre, Pretoria)
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& Maarten de Wit (AEON-ESRI, Nelson Mandela Univ, PE),
Maarten.deWit@mandela.ac.za

Updated 27 January 2018

Africa is one continent, not a mosaic of some 56 countries superimposed on it in the last 200 years by outside colonisers. One sees a communal Africa, the birthright of all Africans, indeed the birthplace of all humans.



Africa's Autobiography

Our Mother Continent's epic story told along 20 Heritage Corridors

In telling these chapters of the African story, we highlight the prodigious changes that have affected our planet over the aeons. Earth's history has been dynamic from the start — and there is no sign of it letting up.

Endorsements

The Corridors initiative enjoys the backing of UNESCO, and the particular endorsement of leading world figures: from Nelson Mandela (when still President of SA) referring to the 'Children of tomorrow's world', to Kofi Annan (former Secretary-General of the United Nations) speaking of reaching 'out to all the people of the world'; The Dalai Lama recalling 'the importance of a caring attitude towards the environment'; and Jane Goodall stressing that 'we are endangering the future of life'.

Africa Alive Corridors is part of a wider drive leading from our ancestral continent to Gondwana and to the world.

Africa Alive Corridors (AAC)

We tell here the biography of Africa — from around four billion years ago to the present — through a selection of 20 chronologically sequenced corridors. The story is holistic, viewing the continent from the geological, biological and cultural perspectives. And the story is inclusive in that all 56 countries of continental Africa (plus Madagascar and surrounding Indian Ocean islands, as well as the Canary Islands) are involved. The narrative is of epic proportions, revealing a colossus amongst the continents of our Earth. We trace several threads through the chapters of the biography: continental drift, mega-geohazards, climate change, biodiversity, our human roots, our evolving culture and spirituality, and lastly our impact on the Earth. There is an obvious focus on the more general geological and biological themes in the earlier corridors and on the more human and human-oriented themes in the later corridors.

Gondwana Alive Corridors (GAC)

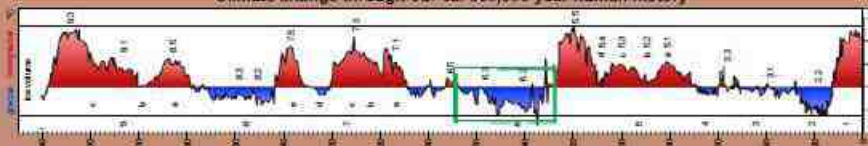
The 'Gondwana Alive Corridors' concept was introduced concurrently in August/September 2002 at the 11th International Gondwana Symposium in Christchurch, New Zealand; and at the World Summit on Sustainable Development in Johannesburg, South Africa (De Wit & Anderson, 2003). We find the pairing is symbolic. The corridors embrace two essential elements: the first being the selection of ribbons of territory (corridors) telling uniquely well the successive chapters in the story of our Earth; the second being the sustainable curation of these noded belts of prime global heritage. First there is the science, thereafter the management.

The project was again presented and widely endorsed at the 12th International Gondwana Conference in Mendoza, Argentina (Sept 2005); and at the 14th International Gondwana Conference in Buzios, Brazil (Sept 2011) — with the general agreement that the project be coordinated from a central AEON base in South Africa.

Earth Alive Corridors (EAC)

To tell the complete story of our Earth, to draw in all of its 7.4 billion people, and to acknowledge all its 5–10 million or so species, this initiative must clearly, sooner rather than later, embrace our entire planet. Obvious chapters in Earth's story — not told in Africa or Gondwana — include the repeated advances and retreats of the Arctic ice-sheet across the northern landmasses during the Pleistocene; and the climatic birth of human civilisation in the Fertile Crescent around 11,600 BP — perhaps the real start of our lasting impact on the Earth as we moved into the Anthropocene.

Climate change through our ca. 300,000-year human history



Note the large-scale cyclic swings & the huge effect on the landscape

Pinnacle Point—looking S across the shallow continental shelf



Towards stemming the 6th Extinction & climate change

Chris Murray

Homo sapiens Corridor (HSC)

Guidelines (& outlines) to contributors

These are the guidelines essentially as they were sent out to the contributors with our August 2014 Newsletter. Most of the Nodal chapters are now well advanced.

'Africa Alive Corridors' (companion volume): In this volume of 500 pages, the content & concept of the mother project is described. The bulk of the book (400 pgs) consists of a 20-pg chapter on each of the 20 Corridors selected to tell the biography of Africa over its 4-billion-year history. The HSC is one of those chapters: number 10 in the chronological sequence 1-20. The cover page of our newsletter, originally designed as an AO poster, gives in a nutshell the scope of the AAC project, and the context of this HSC volume.

Contributors: It is the aim throughout the project (AAC & HSC) that the contributors are those who have done or are doing the frontline research; in the case of HSC, those leading the archaeological excavations for instance. It is vital that the science underpinning the work is current & robust.

Inclusiveness: Please bring in colleagues where relevant; the wider and more authoritative the contributions, the more readily and widely the work will spread.

Table of contents: See the accompanying table giving a breakdown of the structure of the book.

Chapter outlines: These are provided as guides to contributors of the content we are seeking. They are informed by an overview of the content included in the introductory section of the book and in the other Nodes/chapters. Please don't extend beyond the 10 pgs for each Nodal chapter.

The Nodes (Primary & Satellite): Primary Nodes are numbered 1-20; Satellite Nodes are lettered A-J. Each is plotted (see maps) as an area of 25 km radius (50 km diameter)—approximating the foraging radius through the seasons of hunter-gatherer groups. The Node is named after the most significant site within its orbit, but usually includes a number of other named sites; or may be named after a major physical feature or town/city.

Chapter content (pattern): Each chapter (Node), consisting of five 2-pg spreads, follows a pattern—within reason. The opening spread spotlights the special significance of the Node (and sites); the central spreads explore further the focal issues, phenomena or sites highlighting the Node; the final spread includes a first-person narrative of a key moment in our human story as highlighted in the chapter.

Specific guidelines: Scattered through the chapter outlines, we include miscellaneous editorial guidelines (in square brackets in light-grey boxes).

Provisional format: See the drafts as following a provisional layout; we have still to negotiate with the publishers a final format (an A4 page-size is most likely).

Maps: All corridor & node maps are being created by Ingrid Booysse (Dept Geography, University Pretoria); so please see the current versions appearing in any circulated chapter as rough drafts.

Text/illustration mix: A 50/50 balance is the aim; the text often being seen as an expanded caption.

Photos & figures: Ideally contributors should provide their own illustrations (supplying us with the high-res originals for publication); but where necessary we will source other photos & graphics.

Text: Whilst the greater part of the text should be yours (or that of co-contributors), bits & pieces in between might be ours; the editors—as narrators (the distinction will be made clear).

Occupation levels (ages): Throughout, the imperative is to include the most recent reliable dates; the more tightly resolved the ages of the occupations at sites the more meaningful the story, and the better the tie to climate change, sea-level fluctuations & other regional or global phenomena. This is the factual database that links sites along the corridor. It provides a baseline from which to speculate about many of the things we wish to spotlight: the evolution of our brain & cognition, communication & music, social structures, creativity & engineering skills. Did these vary along the corridor? Is there any evidence for social (or anti-social) group activity—locally, regionally, or along the entire corridor (coastline or inland)?

First-person narratives: For each Node we include a closing 2-pg spread, to tell—in the 1st person—a moment in the overall *Homo sapiens* narrative as occurred along the southern Cape (see p 9-10 in your chapters for any further notes). We would like at least some of these stories to read like the Grimm or Anderson tales of the 1800s, with all their extremes of high & low (though embedded in the best scientific & historical/archaeological fact). The hope would be for them to spread as part of our common global heritage—bonding all of humanity.

References: 3 or 4 general, key, current references, often by the contributor(s) should be included per chapter (Node). We are exploring some online site/link for all supplementary data (including relevant references).

Schedule: We had initially hoped to publish by end-2012 (but the project has been simply too large); now the commitment is end-2018; with finished edited contributions ready by mid-2018.

Editors (general & scientific): John M Anderson & Maarten de Wit: AEON (Africa Earth Observatory Network). Our challenge for each book is to create a work more akin to a film or a symphony, with numerous diverse parts woven convincingly into one harmonious whole; not a book of disparate parts as in a symposium volume. Our job is more that of director (film) or conductor (symphony) than editor (symposium volume).

Big holistic history: This is the perspective. It is our conviction from the scientific & historical evidence that our world, our civilisation & the diversity of species around us, is teetering on a knife-edge. We might see our global civilisation on the edge of eclipse—just as the San found themselves as successive colonialists spread through their territory.

Readership/market: Our purpose is to reach everyone (from scientist to scholar, president to worker); to create a market. We need to inspire a new dynamic dialogue, globally. Ideally we need to reach every family worldwide—if we are to achieve our goal of stemming the Sixth Extinction & living meaningfully in the Anthropocene.

Publisher: Springer-Verlag (Germany) are committed to taking on the full series of 'Africa Alive' volumes. Going this route will depend on our negotiating a format that will appeal very broadly; a marketing strategy that will ensure optimal global sales; and a price that will suit everyone's pocket.

Interactive digital ebooks, DVDs, other media: We plan to spread to all relevant modes of publication (especially the ebooks & translations for scholars etc.), to help spread the Big-history message.

AAC Newsletter & website: These guidelines and the accompanying 'Contents' tables that follow are circulated here as a Newsletter—the third of a series intended to appear periodically throughout the duration of the publishing project (embracing a 5-year plan for completing the full series of 22 AAC volumes)—& posted on the AEON site.

John M Anderson & Maarten de Wit
AEON, Pretoria/Port Elizabeth, January 2018



[to be updated]

Homo sapiens Corridor

CONTENTS (500pp)

Revised guide to the table of contents.

Introductory section (216pp)		Principal contributors
Introductory (10pp)		editors (JMA & MdeW)
Geological (40pp)		Maarten de Wit
Rock foundations & Cape Supergroup		
Cape Fold Belt		
Break-away from Gondwana		
Dynamic seascapes & coastlines		
Biological (120pp)		
Flora (40pp)		
Cape Floral Kingdom (10pp)		[John Manning]
Biodiversity & endemism		Braam van Wyk
Geoeodynamics (10pp)		Vera Hoffmann & Woody Cotterill
Food & medicinal plants (20pp)		Ben-Enk van Wyk
Insects (10pp)		
Pollinators (8pp)		Natasha Mothapo
Argentine ants (4pp)		
Terrestrial fauna (30pp)		
Mammals (20pp)		Graham Kerley & Kas Hamman
Reptiles & amphibians (4pp)		[Vincent Carruthers]
Birds (10pp)		[Graham Avery]
Marine fauna & flora (40pp)		
Fauna (30pp)		Ronel Nel, George Branch
Flora (10pp)		Stephanie Pilon
Cultural (30pp)		
Human Genome/TimeTree (6pp)		Raj Ramesar et al.
Occupation levels (4pp)		Lynn Wadley & Marilze Lombard
San rock art (10pp)		John Parkinson & Renee Rust
Ochre (4pp)		Tammy & Jerome Reynard
Historical to today (6pp)		editors (JMA & MdeW)
Climate Change (16pp)		
The past (8pp)		editors (JMA & MdeW)
The future (5pp)		editors (JMA & MdeW)
Legal responses (6pp)		Louise du Toit

Nodes & Satellite Nodes (220pp, details adjacent)

End pages (14pp)

Glossary & Index

Corridor & Node maps—Ingrid Booysen (Univ. Pret.) Dept Geogr.

Square brackets—[Contributors to be approached]



Nodes & Satellite nodes (280pp)

1. Cederberg	John Parkinson
2. Diepkloof	John Parkinson
3. Langebaan	David Roberts
4. Yzerfontein	editors (JMA & MdeW)
5. Cape Peninsula	editors (JMA & MdeW)
6. Stellenbosch	editors (JMA & MdeW)
7. De Kelders	Melissa Krige
A. Montagu	editors (JMA & MdeW)
B. Continental Shelf	editors (JMA & MdeW)
8. Blombos Cave	Chris Henshilwood
C. Stilbaai	editors (JMA & MdeW)
D. Anysberg	Renee Rust
9. Klein Swartberg	Renee Rust
10. Groenfontein	Di Grant
11. Gamkaberg	Renee Rust
E. De Hel (Groot Swartberg)	editors (JMA & MdeW)
12. Boomplaas	Janette Deacon
13. Pinnacle Point	Curtis Marean & Peter Nilssen
14. Sandkraal	Nicol van Niekerk
F. George	Christo Fabricius
15. Oakhurst	Janette Deacon
16. Nelson Bay Cave	Janette Deacon
17. Klasies River	Sarah Wurz et al.
18. Baviaanskloof	Richard Cowling
19. Scott's Cave	Janette Deacon & Judith Sealy
20. Melkhoutboom	Janette Deacon
G. Howieson's Poort	editors (JMA & MdeW)
H. St Croix Island	Pierre Pistorius & Loren Pichegru
I. Addo Elephant Park	Graham Kerley
J. Dwesa Nature Reserve	editors (JMA & MdeW)

Length of chapters:

20 Primary Nodes—12 pages each (240 pgs)

10 Satellite Nodes—2 pages each (20 pgs)

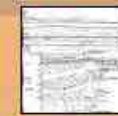
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AEON, Pretoria/Port Elizabeth, January 2018



Palaeontological Society of Southern Africa 20th Biennial Meeting



July 4 - July 6, 2018
National Museum, Bloemfontein



Palaeontological Society of Southern Africa 20th Biennial Meeting

Bloemfontein July 4 to July 6 2018



CIRCULAR TWO

Registration

Registration forms are now available for download on the National Museum website www.nasmus.co.za under Research Departments, Karoo Palaeontology, PSSA conference, or follow the link here:

<http://www.nasmus.co.za/departments/palaeontological-society-southern-africa-biennial-meeting-2018>

The form includes guidelines for payment and a template, which must be filled in and emailed to the PSSA Treasurer, Mrs Elize Butler at elize.butler@nasmus.co.za

Abstract

Abstract submissions are now open. Abstract forms must be downloaded from the National Museum website www.nasmus.co.za under Research Departments, Karoo Palaeontology, PSSA conference, or follow the link here:

<http://www.nasmus.co.za/departments/palaeontological-society-southern-africa-biennial-meeting-2018>

The abstract form has been designed in a particular format. Please fill in the template. Do not send your own document that is not formatted in the template's style. Abstracts not submitted via the template will be returned for formatting. Please send your abstract to the Program Chair, Dr Jennifer Botha-Brink at jbotha@nasmus.co.za

More details will follow in the 3rd circular in 2018. Please check the website regularly.

Reminder of Important Dates

4-6 July 2018	Main Conference Dates
01 December 2017	Registration Opens
15 December 2017	Call for Abstracts Opens
01 March 2018	Abstract Submissions Close
01 May 2018	Notice on Decision on Abstracts
15 June 2018	Registration Closes
03 July 2018	Pre-Conference Workshop
7-8 July 2018	Post-Conference Field Trip

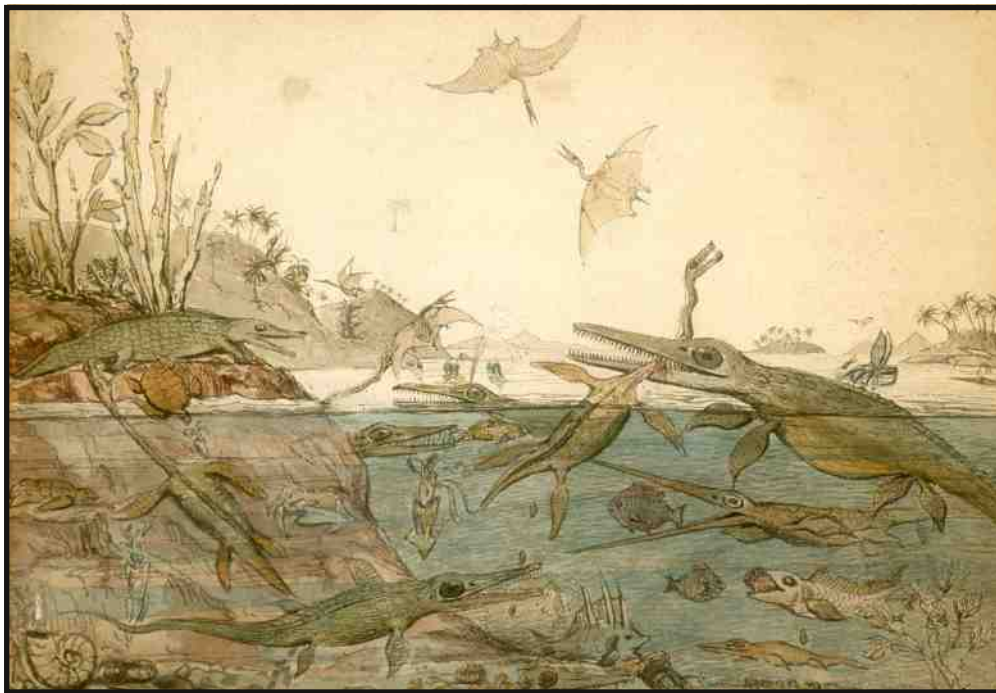
Costs

Registration (Standard)	R1900
Registration (Student)	R1200
Late Registration	R2100
Pre-Conference Workshop	Free
Post-Conference Field Trip	To be Announced

Paleoart Feature: *Duria Antiquior*

By Gina Viglietti
gl.viglietti@gmail.com

I doubt that any palaeontologist the world over has failed to come across this famous illustration. However, not as many may know of the artist, their inspiration behind this art work, nor the significance of it. *Duria Antiquior* was



illustrated in 1830 and is accepted to have been the very first paleoart piece to have been created. The marine reptiles and pterosaurs it presents to the viewer were rendered as accurately as the burgeoning science of Palaeontology would allow for at the time. The illustration was widely circulated in print, allowing public access to the image that extended far beyond academic circles.

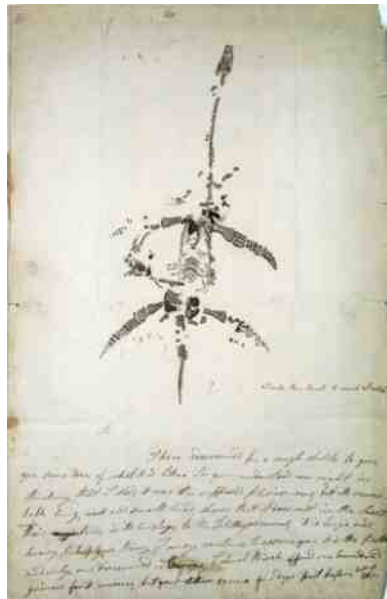
I like to think that on viewing this illustration, it awoke a deeply buried curiosity inside most people. A curiosity and a desire to question that had been dulled by centuries of fearful depictions of devils and demons. This illustration represented an attempt not to depict imagined monsters but real and marvelous, if not also frightening, creatures that once lived long before we did. It was an attempt to make deep time understood by these early pioneers of palaeontology.

The creator of the illustration was Henry De La Beche (1796 – 1855). Born in London, England, he was not a formally trained artist, rather a Geologist and one of the first Palaeontologists. De La Beche was initially put into military training by his mother as a nod to his deceased father who had been a military officer. However, young De La Beche's curiosity for the world could not be stifled, and at the age of 21 he joined the Geological Society of London.

He was soon hired by the government to work as a geological surveyor. On his surveying trips he often uncovered fossils, which he collected and brought back to the Geological Society for further research. De La Beche also collected fossils alongside another local Palaeontologist of the time – Mary Anning. It is rumored that De La Beche and



Anning had met as teenagers when they both were living in Lyme Regis where they hunted for “snake stones” (ammonites) and “devil’s fingers” (belemnites) together along the beach. However, the verity of this part of the story is sketchy. That aside, De La Beche and Anning worked closely together as adults. As the Geological Society of London did not allow for women to be members at the time, De La Beche did his best to ensure that Anning’s contributions to scientific papers were recognized, especially since her discoveries were often species of marine reptiles that were new to science. Tragically, Anning was more often taken advantage of than acknowledged for her contributions. In 1830, Anning



was suffering financial strain and was on the brink of poverty. Wishing to help Anning, De La Beche illustrated a watercolour artwork depicting a plesiosaur, three ichthyosaur species, and even a species of *Dimorphodon* - finds which Anning single-handedly discovered. The illustration was named *Duria Antiquior*, which is latin for “A more Ancient Dorset”.

De La Beche then commissioned George Johann Scharf who created a final lithograph of the illustration. He managed to sell copies of the lithograph to members of the Geological Society and other wealthy friends, donating the proceeds to Anning. *Duria Antiquior* could be considered the story of a 19th century Go-Fund-Me campaign to keep Mary Anning clothed and fed. The publicity the illustration garnered had the largely unintended effect of inspiring ordinary members of the public about palaeontology. “Snake stones” and “Devil’s fingers” become ammonites and belemnites, and over time many people walking along the British seashore found they were no longer afraid of the mysterious creatures they found trapped in stone as they flicked them over with their feet for they had a better understanding of the real world. De La Beche was extremely generous in keeping Anning above the poverty line, as well as providing her some free marketing for her fossil collecting shop. However, the initial capital De La Beche put forward into the creation of *Duria Antiquior* had a questionable source. De La Beche’s father had been the owner of a sugar plantation in Jamaica and was a slave owner. When his father passed away, De La Beche inherited the plantation and so became a slave owner himself. While De La Beche continued to live in London, he briefly resided at his plantation between 1823 – 1824 while he made a geological survey of Jamaica. The plantation served as a steady source of disposable income for De La Beche to pursue his interest in palaeontology in his younger years.

The pursuit of knowledge and understanding in burgeoning scientific fields of their day holds a human cost. It is a dark history that runs parallel with the growth of science. But like anything we lack a complete understanding of, this history must be studied objectively and honestly to be fully understood.

Recipe Corner: The Bonebed Cocktail

By Jonah Choiniere
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Above: Your Bonebed cocktail is best enjoyed chilled with some dinosaur bone shaped ice cubes, and sipped while watching a Karoo sunset.

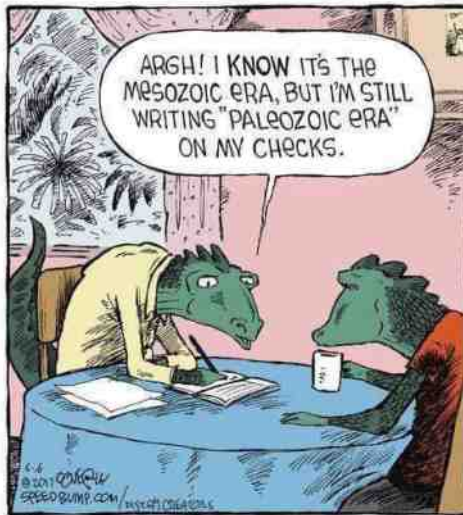
We invented this cocktail on a celebratory evening after Mr James Ralane showed us the sauropodomorph bonebeds near Sterkspruit. The ingredients keep well, the flavors are refreshing, and it packs a wallop.

2 cups tequila (from Mexico, not Graaff-Reinet)
½ cup Cointreau or triple sec
1 cup orange juice
3 cans lemon-lime Twist
Juice of 3 limes
3 sliced limes and 3 sliced lemons
ice

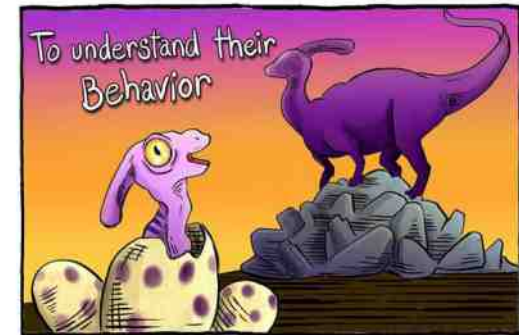
-Squeeze the limes into a large bowl, then combine the tequila, Cointreau (or triple sec), orange juice and Twist. Fill with ice and garnish with sliced limes and lemons.

-Repeat as necessary.

Comic Corner



When you're late for work but the streets are crowded with placoderms...



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