

BIANNUAL NEWSLETTER OF THE PALAEOONTOLOGICAL SOCIETY OF SOUTHERN AFRICA

(HALFJAARLIKSE NUUSBRIEF VAN DIE PALEONTOLOGIESE VERENIGING VAN SUIDER AFRIKA)

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Front cover: The oldest known terrestrial animal remains from Gondwana: the 360 million year old pincer (*top*) and sting (*bottom*) of *Gondwanascorpio emzansiensis*, a scorpion from the Witteberg Group Waterloo Farm shale, Grahamstown. Specimen at top 35mm, at bottom 20mm.

EDITORIAL

I must commend the palaeontology community for providing so much news for this edition of PalNews. Clearly the latter half of 2013 was a busy one and I'm really pleased that you are sharing your experiences and achievements.

Billy (ed)

PRESIDENT'S CORNER - *Bernhard Zipfel*

Dear Friends and Members of the PSSA,
Welcome back to a brand new year and the first issue of PalNews for 2014. Our Editor, Billy De Klerk has as always done an excellent job of snooping around to find out what everyone is up to, as you will see in the following pages. Thank you for your contributions. Last year was extremely busy with some major changes and developments in the Palaeosciences. This year will be no different as you will see in this issue. 2014 is another PSSA Conference year, this time in Johannesburg, 11th to 14th July. The conference is the only official opportunity we have to meet as a Society, and I look forward to seeing most, if not all of you there. Please start filtering the major events and developments happening at your respective institutions through to me so that I can include them in my presidential report at the conference. Feel free to contact me at Bernhard.Zipfel@wits.ac.za.

As in the past this promises to be an exciting year with positive developments in the palaeosciences in South Africa. I wish everyone well in their endeavours!!



Bernhard

Dear Palaeocommunity,

Sometime last year a note was circulated asking you to "Save the Date" for the biennial Palaeontological Society of Southern Africa meeting, hosted by the Evolutionary Studies Institute of the University of The Witwatersrand in Johannesburg, **July 11th – 14th, 2014**. I now have the pleasure of opening the call for abstracts for PSSA'14. Please note that the **deadline for abstract submission is April 1st 2014**. We will begin reviewing abstracts almost immediately, so the sooner you submit the sooner you will hear back from us. As in previous years, every accepted abstract will be published in its entirety in the 2014 issue of Palaeontologia africana. The PSSA'14 meeting website: <https://sites.google.com/site/palaeontologicalsociety2014/home> Abstract Submission and Guidelines can be found here: <https://sites.google.com/site/palaeontologicalsociety2014/home/abstract-submission-guidelines>



Please make note of the following:

1. The title of your presentation should be limited to 200 characters, including spaces
2. Please provide at least 1 corresponding author email and note that fields for additional authors will be enabled upon entering the total number of authors in the form. We ask that each presentation be limited to 5 authors.
3. Abstracts are limited to 400 words, and **MUST**:
 - Contain no citations
 - Address background, methodology, results and conclusions.
4. We are introducing a new format to oral presentations this year, which we've called "lightning talks". These talks are limited to 5 minutes, with a further 2 minutes for questions. The ideal lightning talk will address a single idea in a way meant to stimulate further discussion or provide preliminary yet promising results of a pioneering study.
5. In addition to the general---topic presentations, there are four symposia for 2014. We will accept standard oral, lightning, and poster presentations for consideration in each symposium. Full descriptions will soon be posted on <https://sites.google.com/site/palaeontologicalsociety2014/> the website, but in the meantime you may contact the symposium chairs for more information:

- Environment and Ecosystem change across the Permo-Triassic: Natasha Barbolini, barbolini.natasha@gmail.com
 - Hominin evolution and its Ecological Context in the Cenozoic: Dr Christine Steininger, ihominin@gmail.com
 - Earliest Life and their Environments: Cameron Penn---Clarke, cpennclarke@gmail.com
 - Palaeontology and Education: Problems and Solutions: Dr Ian McKay, ian.mckay@wits.ac.za
6. Finally, we ask that when you are finished with your abstract submission form, you click the email submit button at the bottom of the page.

Thank you for submitting your abstracts, and please do share this document and the abstract submission form with your colleagues both at home and overseas. We look forward to a wonderful meeting!

Sincerely,

Jonah Choiniere

Jonah Choiniere
PSSA 2014 Chair
Senior Researcher, ESI
Editor, *Palaeontologia africana*

Palaeontologia africana

Now freely available online! (last decade)

Papers published from Dec 2003 (vol. 39) till Dec 2013 (vol. 48) are now freely available online via the University of Witwatersrand's website.

<http://wiredspace.wits.ac.za/handle/10539/13253>

Earlier issues will be added to this resource as and when they are scanned and uploaded. The goal is to have the entire journal run digitized by 2015.

Dr. Jonah Choiniere continues as editor of *Palaeontologia africana* ably supported by Associate Editor Professor Marion Bamford along with Professor Bruce Rubidge and Dr. Lucinda Backwell. Finally, the Editorial Panel has made it their objective to obtain an ISI listing for *Palaeontologia Africana* by 2015. Keep those submissions in mind!

For the rest of 2014, please submit your manuscripts via email to Jonah at: jonah.choiniere@wits.ac.za or to Marion at marion.bamford@wits.ac.za.

- O -

NEWS FROM:

Francis Thackeray - EIS at Wits

EXHIBITION ON SOUTH AFRICAN PREHISTORY, AT THE NATURAL HISTORY MUSEUM IN TOULOUSE



Opening of exhibition on South African Prehistory, Natural History Museum, Toulouse, 29th October 2013.

From left to right: Francis Duranthon (Director of the Natural History Museum in Toulouse), Kagiso Masete (South African Ministry of Science and Technology), Derek Hanekom (Minister of Science and Technology, South Africa), Monsieur Pierre

Lemonde (French Embassy, Science Counsellor), and Francis Thackeray (Evolutionary Studies Institute, University of the Witwatersrand, South Africa).

On October 28 2013 an exhibition on South African Prehistory was opened at the Toulouse Natural History Museum. This exhibition is part of the "Two-Seasons" project whereby French exhibitions were held in South Africa in 2012, with reciprocal exhibitions from South Africa in France in 2013. The prehistory exhibition in Toulouse was organized by Professor Francis Thackeray (University of the Witwatersrand) with others from South Africa (including the Rock Art Research Centre, the Origins Centre, Iziko Museums of South Africa and the McGregor Museum), in close association with the Director of the Toulouse Natural History Museum (Dr Francis Duranthon), Prof Jose Braga (Paul Sabatier University of Toulouse), Dr Maja Wasyluk and a team associated with the natural history museum in Toulouse.

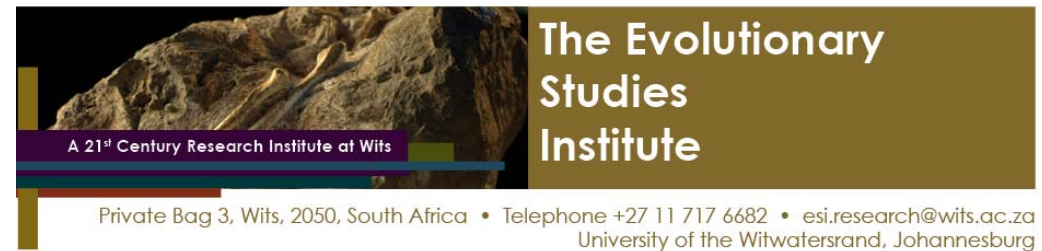
The exhibition is a great success, attracting large numbers of visitors. It features displays on hominins (including replicas of *Australopithecus sediba*, Mrs Ples and the Taung Child); artefacts such as Earlier Stone Age handaxes, Middle Stone Age flakes, and Later Stone Age segments, reflecting innovations and changes in technology through the Pleistocene; and reproductions of rock art. There is particular interest in a replica of engraved geometric art from Blombos Cave in South

Africa (75,000 years old), juxtaposed with the earliest (Aurignacian) geometric art from France (about 35,000 years old), both associated with "anatomically modern *Homo sapiens*").

The opening of the exhibition was attended by the Deputy Mayor of Toulouse, representatives from the French Institute, and Minister Derek Hanekom of the South African Ministry of Science and Technology. In his speech the Minister emphasized the importance of the palaeosciences in South Africa, and referred to the recent Palaeosciences Strategy developed by the Department of Science and Technology. The DST has made substantial funds available to support palaeontological and archaeological research and fieldwork in South Africa, supplemented by funds from France through the French Embassy and the CNRS. The opening function was followed by a lecture delivered by Francis Thackeray, on Wonderwerk Cave and animals associated with Southern African rock art (particular reference being given to the roan antelope, *Hippotragus equinus*).

Support for the exhibition was generously obtained through the National Research Foundation, the French Institute, the French Embassy in South Africa, and many sponsors who are gratefully acknowledged at the exhibition itself. The exhibition is scheduled to be open until March 31, 2014.

Francis Thackeray



CENTRE OF  XCELLENCE
PALAEOSCIENCES



Bruce Rubidge for ESI (Wits University)

Report of the Evolutionary Studies Institute, University of the Witwatersrand, Johannesburg

The Evolutionary Studies Institute (ESI), formed through an amalgamation of the Bernard Price Institute for Palaeontological Research (BPI) and the Institute for Human Evolution (IHE), was officially opened as one of the new 21st Century Institutes of Wits University on 1 July 2013.

Currently research of the Institute focusses largely on the fossil hominin record of southern Africa as well as the palaeobiology of the rocks of the Karoo Supergroup. As the

institute matures it will broaden its multidisciplinary scope of research to include incorporating the disciplines of palaeontology, palaeoanthropology, molecular biology, genetics, geosciences, archaeology, geography, biology, ecology and climatology. 2013 was a very productive year for the Institute and was marked by the graduation of a large number of postgraduate students. The following postgraduate students successfully completed their degrees during 2013:

BSc Hons - M. Andrew, K. Chapelle, S. Iqbal, M. van den Brandt

MSc

BAKER, S. "Accumulation behaviours and taphonomic signatures for extant verreaux's eagle nests, *Aquila verreauxii*, in southern Africa"

JIRAH, S. "Stratigraphy and sedimentology of the Tapinocephalus Zone (Abrahamskraal Formation) in the area around Merweville"

ODES, E. "Establishing incidences of dental calculus and associated plant microfossils in South African Plio-Pleistocene hominin dentition"

PARKINSON, A.H. "*Dermestes maculatus* and *Periplaneta americana*: bone modification criteria and establishing their potential as climatic indicators."

PhD

- DAY, M. "Middle Permian continental biodiversity changes as reflected in the Beaufort Group of South Africa: A Bio- and Lithostratigraphic review of the *Tapinocephalus* and *Pristerognathus* assemblage zones"

- HODGSKIIS, T. "Ochre use at Sibudu Cave and its link to complex cognition in the Middle Stone Age' (GAES, Wits)

- NALLA, S. "The morphology of the upper thorax of *Australopithecus sediba* within the context of selected hominoids."

- VAL, A. "A 3D approach to understanding the site formation process and taphonomy of hominin remains from the Plio-Pleistocene site of Malapa, South Africa."

Research

The following is an overview of the projects of staff and students of the ESI, and is followed by a list of papers published in 2013.

Fernando Abdala is involved in a number of projects on basal therapsids which includes the description (with Bruce Rubidge, Christian Kammerer and Mike Day) of a second specimen of the therocephalians of *Simhorinella* from the *Tapinocephalus* Assemblage Zone and a detailed description of all the material of *Tiarajudens* and its comparison with *Anomocephalus africanus* with Juan Cisneros. In addition he, together with Sandra Jasinoski and Vincent Fernandez, has published an ontogenetic

study of the dentition and dental replacement of *Thrinaxodon* in the Journal of Vertebrate Paleontology. While in Argentina on vacation in December-January, Fernando, together with N. Nasif, completed a draft of a manuscript on the skull of the South American rodent *Dynomys branickii*.

Lucinda Backwell has spent the past six months working on the subtitles for 20 hours of video footage taken of discussions held with San elders at Museum Africa; the text and images for a book on Kalahari Bushman material culture; taphonomic data collection on bones modified experimentally by 17 invertebrate taxa in an attempt to match the traces recorded on the *Australopithecus sediba* skeletons and associated fauna from Malapa; taphonomic data collection on the hominins, and acquiring images of the traces observed; scanning electron microscope analysis of the mandibles of the invertebrates used in the study, and peloidal structures common in the Malapa deposits; and closing and submitting a weighty manuscript titled "Multiproxy record of late Quaternary climate change and Middle Stone Age human occupation at Wonderkrater, South Africa", currently under review. A documentary film on her research made in collaboration with San elders at Museum Africa was produced by MC4, with the participation of *France Télévisions* and *Planète Thalassa* for France 5 Television. It is called *A Shaman's Journey. The last elders [Le voyage de Kgonta Bo, le chaman]*. An encyclopaedia contribution was published.



Figure caption: Some of the experimental research conducted in an attempt to match the modifications recorded on the 2 million year old hominin and associated faunal remains from Malapa. Top left: Alex Parkinson inserting different types of bones in different states of preservation into termite-infested sediment at the Malapa site. Top right: No flies on Lucinda, but plenty on the bones in the bag in her garden, as well as a lot of maggots. Bottom left: Laboratory experiment using Parktown prawns, and bottom right: James Harrison (Entomologist, Animal Plant and Environmental Sciences, Wits) and Erica da Silva Mbatha (co-supervised Honours candidate) collecting an ant colony for the six month lab experiment.

Marion Bamford joined the OLAPP team for fieldwork in East Africa in July-August 2013, and during this time presented two papers at conferences in east Africa. In September 2013 **Caroline Phillips** from Cambridge University joined Marion as a postdoctoral fellow for 2 years to work on the Koobi Fora project.

Marion and colleagues continue their work on West Coast Miocene floras and in the last year published on the woods from the west coast (Roberts et al., 2013) and the biogeochemistry of Langebaanweg pollen samples (Sciscio et al., 2013). She is also working on the Late Miocene of Kenya. A paper on the description and palaeoclimate reconstruction of fossil leaves from Lukeino, Kenya (site of the early hominin *Orrorin tugenensis*) has been published (Bamford et al., 2013).

Lee Berger was a co-author on a paper describing a new species of fox - *Vulpes skinneri* - published in the *Transactions of the Royal Society of South Africa*. He also authored or co-authored seven papers in a special edition of the journal *Science* on further studies of *Australopithecus sediba*. These studies received significant national and international media coverage (see outreach report). He also successfully devised, led and conducted the Rising Star Expedition in November, which resulted in the discovery and recovery of a huge number of early hominin remains
<http://newswatch.nationalgeographic.com/blog/rising-star-expedition/>

During the course of the year the development of critical infrastructure at the site of Malapa began and the world class laboratory facilities will be completed by February of 2014.

Kris Carlson is busy on a wide range of projects: Hominin musculoskeletal biology and functional morphology - completed work includes comparative and interpretative analyses of upper limb structure and function in *Australopithecus sediba* (with collaborators Churchill, Holliday, and Berger), comparative and interpretative analyses of lower limb structure and function in *Au. sediba* (with collaborators DeSilva, Churchill, Zipfel, and Berger), and comparative and interpretative analyses of thoracic structure in *Au. sediba* (with collaborators Schmid, Churchill, and Berger).

Computer-assisted palaeontology - Completed work (with collaborators Ledogar, Strait, de Ruiter, and Berger) involved the use of Finite Element Analysis (FEA) modelling to understand craniofacial function in *Au. sediba*. Completed work (with collaborators Fernandez, Abdala, Rubidge, and Tafforeau) involved the exploration of fossilized burrow casts from the Karoo. Completed work (with collaborators Kuhn, Zipfel, and Berger) involved a shape analysis of fossilized eggshell fragments from Taung. The authors used surface curvatures to attempt to identify the avian origin of these eggshell fragments. Initial results suggested the helmeted guinea fowl was the best match.

Subchondral bone biology -

Completed work (with collaborators Patel and Jashashvili) involved an analysis of distal tibiae amongst marsupials of different habitual locomotor groups (e.g., bipeds vs. quadrupeds). As predicted, bipeds showed greater radiodensity (i.e., proxy for greater compressive strength) in their distal tibiae than quadrupeds.

Experimental assessment of bone functional adaptations -

Completed work (with collaborators Wallace, Demes, and Judex) involved an analysis of trabecular bone mass and structure in mouse humeri and femora. In the most recent published study, the authors noted that non-linear movements (e.g., turning) maintains trabecular bone mass suggesting that bone maintenance in individuals who are unable to use vigorous exercise regimes may be possible by incorporating irregular movements into exercise strategies rather than high-impact movements.

Joseph Chikumbirike has submitted his PhD for examination and, together with his supervisors Marion Bamford and Amanda Esterhuysen, has been working on three papers relating to charcoal from Great Zimbabwe and the uses of woody plants.

Jonah Choiniere, in the short time that he has been at the ESI, has already undertaken several field trips to the Elliot Formation in the Free State and Eastern Cape Provinces

(together with Billy de Klerk). He is working on a description of *Lesothosaurus* (with Adam Yates, Richard Butler and Paul M. Barrett), and is also involved with a wide variety of other projects on dinosaurs.

Radiation of Mesozoic birds and changes in locomotor modules (with Roger B.J. Benson) has been published in the *Proceedings of the Royal Society, Series B*.

Description of *Aorun zhaoi*, a new theropod from the Shishugou Formation (with James M. Clark, Xu Xing, David E. Eberth, Catherine A. Forster and Mark A. Norell) has been published in *Systematic Palaeontology*.

Haplocheirus sollers cranial osteology (James M. Clark, Xu Xing and Mark A. Norell) has been accepted for publication in *American Museum Novitates*.

Michael Day completed his PhD on the stratigraphy, basin analysis and biodiversity change during the Middle Permian of South Africa. He, together with Bruce Rubidge, has several projects in progress. Lithostratigraphy and Basin development of the Abrahamskraal Formation - Numerous stratigraphic sections have been measured and a manuscript will be submitted in early 2014. These sections, together with biostratigraphic information, will provide the data for a paper on Middle Permian Karoo Basin development.

Biostratigraphy and biodiversity change within the Middle Permian Beaufort Group - Use of the Beaufort fossil database maintained at Wits, in conjunction with extensive field

collecting, enabled an assessment of tetrapod biodiversity change through the late Middle Permian. Generic richness, faunal composition and abundance were all considered and a paper is in preparation.

Christopher Henshilwood has been involved with the following projects over the past year: Tracing the Origins of Behaviourally Modern *Homo sapiens* in southern Africa (see <http://tracsymbols.eu>).

During 2013 annual excavations of the c. 75 ka Still Bay and c. 100 ka archaeological levels at Blombos Cave, southern Cape; new excavations at two Middle Stone Age archaeological sites located in the De Hoop Nature Reserve, Western Cape, Klipdrift Shelter and Klipdrift Cave Lower; reconstructing the climate and environment during the Middle Stone Age (c. 100 – 60 ka) occupations in the southern Cape; the development of innovative methods for the field and laboratory analysis of recovered materials in collaboration with a multidisciplinary team of regional and foreign experts; developing and publishing innovative theoretical models for the early evolution of human behaviours (Ten papers resulting from this work were published in 2013 (see later).

Tea Jashashvili is busy with a large number of projects: Bone structural parameters - Modeling a long bone as a hollow beam permits the use of cross-sectional geometric (CSG) properties to estimate the ability of its diaphysis to resist

deformations that may occur during different activities, particularly dynamic activities such as locomotion. During 2013, progress was made with four papers in collaboration with numerous authors including Dowdeswell, M.R., Carlson, K.J., Marchi, D., Lebrun, R. Lordkipanidze, D. and Stratford, D.

Metatarsal torsion of hominoids - this project investigates the relationship of metatarsal torsion in different African apes that use arboreal and terrestrial settings with different frequencies. Metatarsal torsion is less marked in terrestrial gorillas and suspensory orangutans compared to chimpanzees, but for different functional reasons.

Morphology and function of early *Homo* postcrania from Dmanisi includes several projects on the hand which are of importance as this site has the earliest evidence of hand bone morphology in direct association with stone tools.

Fossilised seeds from Malapa - Approximately 15 seeds of similar morphology were discovered in three breccia blocks as a result of CT scanning. Several multi-authored papers are planned in collaboration with Bamford, M., Carlson, K.J. and Berger, L.R.

Job Kibii has continued his work on:

Small carnivore modification of mesomammal carcasses - actualistic experiments involving feeding of rabbit carcasses as

a proxy of mesomammals to small carnivores has been completed and carcass and scat remains from six carnivores were cleaned and catalogued. Results from two of the carnivore studies were presented at the 4th East African Association for Paleoanthropology and Paleontology (EAAPP) conference 28th July to 2nd August, Mombasa Kenya. Two manuscripts from these results are in preparation.

Description of new fossil hominin materials from Sterkfontein - Description and comparative studies of an Australopithecine first hallux phalanx and an ischium have been conducted. The results of the ischium study were presented at the 4th East African Association for Paleoanthropology and Paleontology (EAAPP) conference 28th July to 2nd August, Mombasa, Kenya.

Cross-sectional geometry of hominin metacarpals - Comparative cross-sectional geometry of metacarpals of modern humans, chimpanzees, gorillas, and Orang-utans has been undertaken and some results were presented at the 1st National Conference on Imaging with Radiation, 23-24 September, Nesca, South Africa.

Brian Kuhn has several projects in progress:

Taung - Brian leads a multi-disciplinary field based project at Taung incorporating Andy Herries (La Trobe University), Philip Hopley (University of London), Colin Menter (University of Johannesburg), Matt Caruana (PhD candidate, Archaeology, WITS), Stephanie Baker (PhD candidate, UJ), Taylor Doran

(MSc. candidate, University College London) and Rhiannon Stammers (MSc candidate, La Trobe University). Two papers are under review, one is published in *American Journal of Physical Anthropology* with Hopley as first author, and another, with Herries as first author, is in *PaleoAnthropology*. Carnivore Taphonomy - Along with MSc. student Stephany Baker, actualistic studies on Verreaux's eagle taphonomy was completed in 2013. In addition, an agreement was reached with SANParks to conduct large carnivore taphonomy studies using free ranging carnivores and prey in natural settings in the Kruger National Park and Kgalagadi Transfrontier Park. A paper, with Baker as first author, was published in *The Journal of the Mountain Club of South Africa*.

Fossil Carnivores - The analyses of fossil Hyaenidae from Cooper's Cave in collaboration with Christine Steininger (Ditsong Museum) and Lars Werdelin (Swedish Museum) was finished in 2013, with the write up scheduled for submission in early 2014. Dr. Kuhn continues to lead a team working on the carnivores recovered from Malapa and resulted in the naming of a new species of fox, *Vulpes skinneri* (Hartstone-Rose et al., 2013). Further analyses based on the Malapa carnivores have produced a manuscript describing the palaeoenvironment circa 1.97 million years ago.

Modern zoology and ecology studies - Brian continues to track various carnivores in the Cradle of Humankind as well as along

the western suburbs of Johannesburg and as far afield as the Magaliesberg range via camera traps. Preliminary results are in press. While this research has been running on a low scale for nearly six years, 2013 saw formation of the Urban Hyaena Research Project, and collaborations with NSPCA, the Johannesburg Zoo, Mankwe Nature Reserve, Leopards for the Future, and the Mountain Club of South Africa. To date, this project covers areas from Florida Glen, through the Cradle of Humankind, to Hekport and the Upper Tonquani region of the Magaliesberg. A manuscript on cave usage by various mammals over a short period of time is currently under review.

Paloma de la Peña

A study of a new type of bifacial pieces from the Howiesons Poort made on quartz. Paloma revised all the quartz fragments recovered from the layers defined as Howiesons Poort at Sibudu. A study was undertaken on the lithic technology of the Grey Sand layer, one of the main stratigraphic units described for the Howiesons Poort of Sibudu.

A project on paleomagnetism has begun, in collaboration with Dr Hugo Nami (CONICET, Argentina) "Geomagnetic field excursions for Late Pleistocene-Holocene deposits in South Africa and Lesotho: Geoarchaeological and chorological implications for the Later and Middle Stone Age".

Caroline Phillips, a postdoctoral fellow working with Marion Bamford, is working on several projects relating to the diet of early hominins:

Phytolith analyses of sediments at Koobi Fora: Evidence of fire? - This project aims to investigate potential plant foods that were available to hominins 1.6mya in the Koobi Fora Region, and also assess whether sediments from discoloured patches have been burnt at high temperatures.

Investigation into dietary adaptation of *Pan troglodytes* using palaeoecological methods - for this project diet and habitat use of two chimpanzee populations are being assessed to explore the dietary adaptation of *Pan troglodytes* from an archaeological perspective using stable isotope analysis and phytolith analysis. Sample collection of modern plant and soil samples, as well as chimpanzee faecal samples was completed 2012-2013 from two chimpanzee study-sites (Nimba in Guinea and Ugalla in Tanzania) in collaboration with Kathelijne Koops, Fiona Stewart, Alex Piel and Gen Yamakoshi.

An archaeological approach to the study of South African mammalian diet - sample collection across multiple study-sites in South Africa, and stable isotope faecal sample preparation was completed in 2013 in collaboration with Marion Bamford, Christine Steininger and Frank Newman.

Riaan Rifkin's postdoctoral research focusses on the analyses of archaeological materials derived from Blombos Cave and Klipdrift shelter. These comprise archaeological pigments (ochre), several pigment processing implements and engraved ostrich eggshell fragments. Ethnoarchaeological and experimental research also forms part of the focus on pigment analyses. Ethnoarchaeological research was carried out amongst the Ovahimba of the Kunene Region in northern Namibia. Experimental research was performed at UiB, the ESI, in Cape Town, and during excavation seasons.

Bruce Rubidge has continued with his main research project and biostratigraphy of the Lower Beaufort around the Karoo basin in association with Fernando Abdala, Charlton Dube, Sifelani Jirah, Michael Day, Luke Norton, Ashley Kruger, Pia Viglietti (ESI); Tyler Lyson (Smithsonian, Washington DC); Gabe Bever (American Museum of Natural History, New York). Five papers resulted from this project during 2013 (see later). In 2013 fieldwork focussed on the upper Abrahamskraal Formation and into the overlying Poortjie Member of the Teekloof Formation in the Beaufort West district.

Later in the year Bruce Rubidge and Roger Smith accompanied PhD student Pia Viglietti to the field in the districts of Graaff-Reinet, Cardock, Colesberg and Jagersfontein to assist Pia to find suitable localities to undertake her PhD research on the stratigraphic correlation of the Barberskrans Sandstone in the

Balfour Formation in an effort to understand development of the Karoo Basin in Late Permian times.

Taxonomic revision of the Dinocephalia. Currently the project has two thrusts:

- Description of the first complete juvenile *Anteosaurus* skull. A newly discovered juvenile *Anteosaurus* skull which has come apart along the sutures is the subject of the MSc of **Ashley Kruger** who has scanned the specimen, is looking at tooth replacement patterns and undertaking allometric studies and will submit in February.

- Taxonomic revision of the Tapinocephalidae. This is the subject of the PhD thesis of **Saniye Güven** (Atayman), a student from Turkey, who has published a paper in *Palaeontologia africana*.

Taxonomic revision of the 'Biarmosuchia' - A paper describing a new species of biarmosuchid from Malawi was submitted for publication by KRUGER, A.; RUBIDGE, B.; ABDALA, F.; CHINDEBVU, E. and JACOBS, L.

Description of dicynodonts from the Beaufort Group - a paper was published with Ken Angielczyk as first author, and another with John Hancox as first author.

As a postdoc, **Miriam Tawane** has been working through the Sterkfontein faunal collection to identify small-medium sized m

animals. To the surprise of the investigators, a few hominin materials were identified. These included a hominin first rib, and a sacral vertebra. The task at hand is to fully describe the two specimens and possibly associate them to the previously discovered hominins from the Sterkfontein caves.

Francis Thackeray has had a productive research year working on five different projects:

Morphometric analyses of Plio-Pleistocene hominins - This resulted in three publications, two jointly with Odes.

The gender of Sts 5 ("Mrs Ples from Sterkfontein) - A manuscript has been written jointly with Braga and Botham and it is in the process of been updated with new data from micro CT scans.

The discovery and CT analysis of a hominin specimen from Kromdraai - Francis Thackeray holds the permit to excavate at Kromdraai with Jose Braga (Toulouse). A new hominin specimen (a temporal bone) has been discovered and has been scanned using micro CT facilities. A paper with Braga as first author was published in *Journal of Human Evolution*.

Quaternary human footprints from Kuiseb river floodplain deposits, Namib Desert, Namibia.

Human as well as animal tracks were studied using laser surface scanning techniques, in Holocene floodplain deposits associated with the Kuiseb River in the Namib Desert. A paper was published in *American Journal of Physical Anthropology* with Morse as first author.

Aurore Val. Since submitting her PhD in July 2013, Aurore has been working as a postdoctoral fellow under the guidance of Lyn Wadley and is busy with the following projects:

Data collection in Toulouse in the context of the actualistic project "Des Traces et des Hommes". Microscopic analysis of cut marks produced by stone tools on ungulate remains, from an experimental sample as well as from an archaeological site (the Mousterian rock shelter of le Noisetier in the French Pyrenees), was undertaken and Aurore and collaborators have written up a paper in *International Journal of Osteoarchaeology*.

Taphonomy of the bird assemblage from all the Middle Stone Age layers from the archaeological deposits at Sibudu Cave (KwaZulu-Natal). Aurore has completed the identification of all the bird bones from the Sibudu assemblage and has begun microscopic analysis of the bone surfaces and breakage patterns of the bones.

Lyn Wadley, an emeritus professor at the ESI, runs an extremely productive programme involving several projects:

Heat treatment experiments with silcrete from the southern Cape, using field fires. People in the MSA seem to have heat-treated silcrete by burying it underground. A paper is in press in *Journal of Human Evolution*, and is jointly authored with Dr Linda Prinsloo, Physics Department, University of Pretoria.

Innovation in the MSA and the effect of this on human cognition. A paper has been published in *Cambridge Archaeological Journal*.

Spatial analysis of scrapers and points from layer SS at Sibudu (58,000 years ago). This occupation floor is unusual because of its large hearths, a posthole and a clear cluster of scrapers in one part of the excavation grid. Geeske Langejans conducted residue analysis on three scrapers and found red ochre and traces of animal remains. This suggests that hide working took place around the hearths. A joint paper has been accepted for the *South African Archaeological Bulletin*.

Sarah Wurz is also involved with several projects. She completed lithic analysis of the Howiesons Poort levels from Klipdrift shelter with Dr Anne Delagnes and Dr Katja Douze. The preliminary results will appear in the *Journal of Archaeological Science* in 2014. She also undertook two successful field seasons at Klasies River. Micromorphology samples were collected by Dr Susan Mentzer, and sediment

samples were collected for phytolith and pollen analysis. A comparative sample of the vegetation around Klasies River has been collected, and interviews with local inhabitants undertaken about their use of these particular plants.

A review of the Middle Stone Age has been completed after attendance of a Wenner Gren Workshop "Alternative Pathways to Complexity: Evolutionary Trajectories in the Middle Paleolithic and Middle Stone Age." 1-8 June, 2012, Stockholm. This has been published in *Current Anthropology*.

An article on measuring complexity in stone tools was completed (with co-authors), subsequent to a Wenner Gren Workshop "Alternative Pathways to Complexity: Evolutionary Trajectories in the Middle Paleolithic and Middle Stone Age." Held from 1-8 June, 2012, Stockholm. It was published in *Current Anthropology*.

Despite being very busy with curating the extensive collections of the ESI, **Bernhard Zipfel** is also involved in a number of research projects on hominin postcrania. Progress has been made with the preparation of the various chapters for the book 'Hominid post-crania from Sterkfontein' with co-editors B. Richmond and C. Ward. A number of chapters have been sent for review and the book will be published toward the end of 2014 by Oxford University Press. A study of the lower limb mechanics of walking in *Australopithecus sediba* was published in the journal *Science* with DeSilva as first author.

2013 PUBLICATIONS OF THE ESI

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- DE LA PEÑA, P.** 2013. The Paleoclimatic record for the Gravettian in the Iberian Peninsula. Pastoors, A; Barbel Auffermann (eds.) Pleistocene Foragers on the Iberian Peninsula: their culture and Environment. Festschrift in Honour of Gerd-Christian Weniger for his sixtieth birthday. Wissenschaftliche Schriften des Neanderthal Museums 7, Mettmann, pp. 183-194.
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Mike Day – ESI Wits University

Since July last year, I have started my postdoc in earnest and been mostly been working on preparing aspects of my PhD thesis for publication. I managed to take advantage of the Centre of Excellence for additional funding, and PAST has also awarded me some money to undertake exploratory fieldwork this year. In October I went to Los Angeles, USA, along with some other representatives from the ESI and South Africa, to attend the annual SVP conference there. I presented a paper on the *Tapinocephalus-Pristerognathus* AZ transition and the evidence for an end-Middle Permian extinction. Bruce Rubidge, Pia Viglietti, Roger Smith, Jennifer Botha-Brink and Emile Krupandan were also there representing SA. The Romer Prize was won by Adam Huttenlocker for a talk about the End-Permian mass extinction, primarily using data from the Karoo. I also attended two trips to collect in the Free State with Pia Viglietti. The first was in October to the Gariiep Dam area. This trip was particularly for Pia, so I won't go into detail, but we found a good deal of fossils and hopefully this will help Pia to characterize these strata and provide evidence for identifying the Barberskrans Member of the Balfour Formation in the Free State.

The second trip was to the area around Jagersfontein and Fauresmith, to collect on the Eccia-Beaufort boundary. For me, we collected on the farm Sandymount, west of Fauresmith,

close to where Bruce discovered a lycosuchid therocephalian two years ago. This family of therocephalians is not known from strata younger than *Pristerognathus* AZ, so it indicates the presence of this zone further north than previously recorded. Unfortunately, we did not find any fossils here, but we did obtain a nice looking tuff sample which may contribute to our geochronology project. At Boomplaas Hill (scene of the battle between the Brits and Boers in 1848) we collected in what is thought to be *Dicynodon* AZ for Pia and picked up a lot of material. We also want to determine if the *Tropidostoma* and *Cistecephalus* AZs are present here, and we found an intriguing skull that may indicate that they are not; only time, and Charlton's steady hand, will tell. Whilst staying in Jagersfontein we went to see the colossal excavated Kimberlite that was found just behind the hotel. This is worth seeing.

This year the ESI team under Bruce will be going to Teekloof Pass to collect the *Pristerognathus* AZ. Along with the usual team, we will be joined by Tyler Lyson from the Smithsonian and Vincent Fernandez, from the ESRF in Grenoble, France. Here we are hoping to clarify the latter part of the Middle Permian extinction interval, and how the impoverished fauna in its immediate aftermath begins to rediversify in the upper part of the *Pristerognathus* AZ. This will provide enough data for a complete reconsideration of this latter biozone.



Excavating a large dicynodont skull that Pia found on the north side of Boomplaas Hill.



Pia perplexed by the strange white band on the farm Sandymount, near Fauresmith. I believe this is a tuff and we have sent samples for dating.



Apparently, Jagersfontein has the largest man-made hole in the world, about 2.5 times larger than Kimberley's. Here Pia is looking unphased by the danger sign on the gate and immediately afterwards we went in and looked at it. It is a truly enormous hole.



Me about to carry a plastered *Oudenodon* skull down the mountain and back to the car. It was far.....



Pia cutting a pair of her ruined field trousers into strips for use in plastering a large dicynodont skull she found. Fortunately, this one was right next to the car.



Another *Oudenodon* skull that I found on the farm Vanwyksfontein, just south of the Orange River. The stream in whose bed it lay had done most of the excavating for us.



Pia with yet another plastered dicynodont skull, also up the mountain. She was measuring a section here too.



The mystery skull of Boomplaas Hill. Is this a basal therocephalian typical of the *Pristerognathus* AZ? If so it indicates the absence of the *Tropidostoma* and *Cistecephalus* AZs in this part of the Free State.

Jonah Choiniere, ESI at Wits

What a first year it's been! I'd like to begin by welcoming my returning PhD student Blair McPhee, who's coming to us from Middle Earth (New Zealand) and will be working on the taxonomy, biostratigraphy, and locomotor evolution of transitional sauropodomorph taxa from the Elliot and Clarens Formations. Blair recently received a distinction for his Masters research on *Antetonitrus* and has already put a monographic revision of that taxon into press! Hot on his heels is my new Masters student Kimberley (Kimi) Chapelle, who'll be working on the cranial anatomy and ontogenetic growth of *Massospondylus carinatus* based on CT scans of several important specimens. Kimi received a distinction for her Honours work on the braincase anatomy of this emblematic South African dinosaur. Congratulations also go to Michelle Clack, my Honours student who did excellent work georeferencing the Stormberg collections records of the ESI - look for more GIS-based research from her in the future as she considers her Masters degree! Finally, I'd like to welcome my new Honours student Kathleen Dollman, who will be doing research on braincase pneumaticity in basal crocodylomorphs.



Blair McPhee working on *Melanorosaurus* in the National Museum, Bloemfontein



Kimi Chapelle and the skull of *Melanorosaurus*, National Museum Bloemfontein



Kathleen Dollman, digging a long drop near Elliot, Eastern Cape.



Michelle Clack at the Ash River Outfall, Clarens, Free State

I've taken over as Editor of *Palaeontologia africana* from Professor Marion Bamford and you all should be seeing the December 2013 issue in your hands (or your email) very soon. I would like to specially thank students Luke Norton and Michelle Clack for beginning to upload our entire archive to the Wits WireDspace repository (<http://wiredspace.wits.ac.za/handle/10539/13253>). You can already start downloading PDFs of our last ten years of articles for free, and the rest of the archive will be available by January 2015.

The last few months have been particularly fruitful in the field - work in the **Sundays River Formation** with my good friends Dr. Billy de Klerk, Dr. Roger Benson of Oxford University and his wife Dr. Hilary Ketchum as well as students Blair McPhee and Cameron Penn-Clarke recovered some incredible invertebrate specimens, including a beautiful shrimp found by Cameron.



Sundays River team from left top: Blair McPhee, Jonah Choiniere; from left bottom: Roger Benson, Cameron Penn-Clarke, Billy de Klerk, Hillary Ketchum.



Shrimp found by Cameron Penn-Clarke at the brickworks.



There was a little time for some sight-seeing at Addo (plus outcrops to prospect!).

More recently, I worked with Dr. Billy de Klerk to excavate a very large sauropodomorph dinosaur from the uppermost Elliot/lower Clarens Formation of the Eastern Cape together with a huge crew, including my students Blair McPhee, Kathleen Dollman, and Kimi Chapelle, Natasha Phillips from the University of Auckland, Leo Goosen, Ben MacLennan, and Armstrong and Lindikhaya of the Albany Museum. To jog your memories, this was the dinosaur discovered by the local farmer Selby Vorster whose femur was stolen back in early winter:

<http://www.sahra.org.za/node/121877>. This trip gave me a great excuse to test out our new Atlas Copco Cobra Combi, which performed admirably (thanks to Roger Smith at Iziko for

the recommendation)! Although our excavation was successful in removing the bulk of the skeleton, we sadly discovered that our dino didn't preserve a head. Still, we had a great time staying in an abandoned farmhouse, bathing in the pristine streams (pictures omitted), and enjoying the lovely Eastern Cape Barkley Pass District scenery.



Our charming accommodations near Elliot, Eastern Cape



At the dinosaur site in the Eastern Cape. From left: Kimi Chapelle, Billy de Klerk, Armstrong, Lindikhaya, Kathleen Dollman, Natasha Phillips, Jonah Choiniere, Leo Goosen, Blair McPhee.



Testing out the new Cobra Combi while students work diligently a safe distance away!



Jacketing up a storm!



Celebration with the discoverer of the dinosaur, **Selby Vorster** and his wife, **Marguerite**. From left: Selby, Marguerite, Billy de Klerk, Kimi Chapelle (top), Natasha Phillips (bottom), Kathleen Dollman, Blair McPhee, Jonah Choiniere, Lindikhaya Sandi and Leo Goosen.

Finally, as meeting chair, I'd like to remind you that PSSA'14 is coming right up! See the circular in this volume and plan on attending what looks to be a great meeting (did I mention the free beer?).

Annette Götz – Rhodes University, Grahamstown

2013 Shell Lecture Series Workshop at Rhodes University

In 2013, the Geology Department at Rhodes University continued the Shell Lecture Series and hosted the one week workshop *Biostratigraphy for Palaeoenvironmental Reconstructions and Correlations*, November 11-15 which was attended by 18 researchers and students from seven South African universities (University of Cape Town, University of the Free State, University of the Witwatersrand, University of Pretoria, Nelson Mandela Metropolitan University, University of Fort Hare, Rhodes University) and Nigeria (Lagos).

The workshop was presented by Katrin Ruckwied (Shell), Iain Prince (Shell), and Annette E. Götz (Rhodes University) and main emphasis was placed on palynology and palynofacies, but a short introduction was also given for all other microfossil groups used in industrial biostratigraphy. Lectures and microscopic exercises during the first two days of the workshop provided the participants with the necessary knowledge on the different terrestrial and marine palynomorphs and their application in biostratigraphy. This introductory part was followed by three days of exercises focussing on data interpretation and standard biostratigraphic work flows during exploration as well as palaeoenvironmental reconstructions and correlations. Several case studies from the hydrocarbon industry were presented to demonstrate the different applications of biostratigraphy

during exploration, appraisal and production in conventional and unconventional plays.

This inter-university workshop successfully continued the meanwhile established Shell Lecture Series at Rhodes University, which started in 2012 with the first biostratigraphy workshop, followed by a seismic course in June 2013. The next workshops are planned for June and November 2014 and for further information and registration please regularly visit our webpage: <http://www.ru.ac.za/geology/shelllectureseries/> or contact the course organizer (a.gotz@ru.ac.za).



Participants of the 2013 Shell Lecture Series Workshop

Front row (l - r): Prof Annette E. Götz (Rhodes University), Lara Sciscio (UCT), Prof Marion Bamford (ESI, Wits), Estelle Pretorius (Univ. of Pretoria), Claire Browning (UCT), Sonwabo Nkani (Fort Hare Univ.), Adriaan Odendaal (Free State Univ.), William Krummeck (UCT). Middle row (l - r): Dr Katrin Ruckwied (Shell), Ernest Uzodimma Durugbo (Lagos, Nigeria), Dr Rose Prevec (Rhodes University), Robert Muir (UCT), Marakeng Rhudolf Madigoe (Fort Hare Univ.), Shereen Slamang (Nelson Mandela Metropolitan Univ.), Susan Serfontein (Univ. of Pretoria). Back row (l - r): Brenton Fairey, Jarred Land (Rhodes University), Adam Moodley (UCT), Dr Iain Prince (Shell), Moshood Olayiwola (Witwatersrand Univ.), Manoko Maggie Marokane (Rhodes University). Photo: G. Costin

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

In June-July Helke Mocke, curator of the National Earth Science Museum, organised a collaborative field trip with Italian dinosaur track scientists Dr. Simone d' Orazi Porchetti, Alexander Wagensommer and Marianna Latiano to various known dinosaur track sites in Namibia. The excursion proved to be highly successful and yielded some spectacular results, which will be published shortly. The following dinosaur track sites were visited and investigated; Farm Otjihaenamaperero 92, Farm Klein Etjo near Kalkfeld, the Waterberg Plateau Park, and Farm Neudorf in the Otjiwarongo District. During this time all

tracks were identified, given locality names, each trackway, and footprints measured and drawn onto acetate film. Several new sites were discovered, which are located on the Farm Klein Etjo bordering Farm Otjihaenamaperero. The main known dinosaur tracks site on the Waterberg Plateau, just south of the town, Otjiwarongo was visited and located with the kind guidance of the Ministry of Environment and Tourism staff.



Petroglyphs of animal tracks on the Waterberg Plateau.

When visiting the site one is immediately struck by the immense impact of weathering on the site. Many badly weathered tracks are located on a sandstone surface. These are mostly single tridactyl tracks. Only the best tracks were measured.

The team was also brought to a bushman shelter, where a particular area was covered in engravings depicting various hoof prints of antelopes. The shelter consists of a wide mouthed cave with a good view of the surrounding bush and one of the smaller attached caves has a low ceiling covered in black soot, indicating prolonged fire usage. Stone tools were not seen and graffiti was noted on the walls.



Possible *Otozoum* track on Farm Neudorf.

The quadrupedal tracks that were reported by Wiechman (1983) and Grote (1984) were located on Farm Neudorf on the north-eastern border of the Waterberg Park. The sandstone

pillars that had been reported by Wiechman (1983) are still standing and preserve the slanted laminations of ancient dunes. Preliminary results and analysis indicate that the Otjihaenamaperero ONP I site footprints may be those described as *Kayentapus*. The ONP II site small prints may be the ichnogenus *Grallator* (Lockley *et al.*, 2003). They are found in the USA, Canada, Europe, Australia and China. The ONP VII site footprints may be *Eubrontes*. This ichnogenus has been identified from France, Poland, Slovakia, Italy, Spain, Sweden, Australia (Queensland) and the USA. It is a junior synonym of *Grallator* (Lockley *et al.*, 2003). The tracks at the Waterberg may be *Anchisauripus*, which may have been a small theropod. These footprints are also known from France, Wales, Switzerland and USA, Portland Formation, Connecticut. The Neudorf footprints may be the first record of the ichnogenus *Otozoum* in Southern Africa. Recent osteological comparisons (e.g., Rainforth, 2003) support Lull's hypothesis that the track maker was probably a prosauropod.

Another noteworthy trip was made to the southern Karasburg Basin in August. The participants were Dr Zubair Jinnah from the Geology Department, Witwatersrand University, his M.Sc. student Michael Berti from the Geology Department, Witwatersrand University), and Mrs Helke Mocke from the Geological Survey of Namibia.

The main research question was whether barren Karoo basins differ from coal-bearing basins and if this difference relates to amount of subsidence, sedimentation rate, or palaeoclimate and

palaeoflora. Several outcrops were visited in the Noordoewer, Aussenkehr and Ai-Ais Park areas to look at the geology but also to identify fossils. Siltstones and deep marine shales were seen as well as beautiful ripple marks and trace fossils made by invertebrates.



***Cruziana* trace fossil in Dwyka.**

During the same trip Farm Spitskop, several kilometres east of Keetmanshoop was visited. It is well known by tourists for the *Mesosaurus* fossils. Here the team selected a suitable section for describing the deposits and taking samples. The orientation

of various in-situ *Mesosaurus* specimens was measured and their preservation noted.



***Mesosaurus* ribcage and forelimb.**

In September all museums in Namibia held the annual "Heritage Week" under the theme: "Heritage our Knowledge Bank". As part of that week's celebrations all museums were open to the public for free and hosting special events. The National Earth Science Museum invited several local schools to participate in a treasure hunt and learn more about our geological and palaeontological heritage. A special film on Kwanyama traditional iron smelting was also shown to visitors daily. The museum was well visited by over 600 school pupils.

During November Dr Martin Pickford accompanied Mrs Mocke to the Etosha to excavate fossils which had been uncovered by previous flooding episodes. This was a huge success with the excavation of more than 400 fossil specimens of bovids, horse ancestors, fishes, crocodiles, tortoises, rhino, elephant, birds, carnivore, molluscs, and for the first time armadillo. Well preserved horn cores, jaws and teeth were recovered and some new surprises to be published soon. After this we visited travertine sites in the Kaokoland and Damaraland, some of which did not only yield spectacular views, but also surprise discoveries in the form of small fossil mammals and reptiles. Till next time..... **Helke**

Rob Gess -Albany Museum & Rhodes University, Grahamstown

It has been an exciting last six months for South African Devonian studies. **Rob Gess** completed a year's post doc at Wits at the end of June'13 and took up a post doc at Rhodes from July'13 the first - returning to the Geology department where he started the Waterloo Farm project under Norton Hillier's mentorship in the mid nineties.

In August'13 publication of *Gondwanascorpio emzansiensis* took the world by storm with viral media enthusiasm taking weeks to die down. *Gondwanascorpio*, consisting of diagnostic scorpion fragments from the 360 myo Witpoort Formation (Witteberg

Group), represents the earliest known terrestrial animal remains from Gondwana. In Southern Africa the next oldest terrestrial animal remains are insect wings from the Whitehill Formation which are 90 million years younger.

In September Rob attended the Geoheritage Conference in Oudtshoorn with **Billy de Klerk** and **Rose Prevec**. Rob presented a paper entitled, 'Waterloo Farm - a Devonian palaeoheritage site with immense possibilities for education and geotourism' which went down very well, and led to some useful offers of assistance in developing this theme. It was also great to hear the wide range of presentations and to network and catch up with colleagues.

In October and November **Professor Kate Trinajstić** of Curtin University, Perth Aus., spent five weeks as a guest of Rhodes and the Albany Museum working on Waterloo Farm placoderms with Rob. This resulted in exiting research which will shed light, not just on Late Devonian placoderm taxonomy and diversity, but biology as well. Look out for an important paper on Waterloo farm sharks coming out in *Palaeontologische Zeitschrift* in the next few weeks.



Reconstructing placoderm dermal armour from flattened scattered dermal plates sometimes involves valuable skills learned in primary school!



Kate Trinajstić catching up on Pleistocene (not plasticine) models.
Cheers - **Rob Gess**.

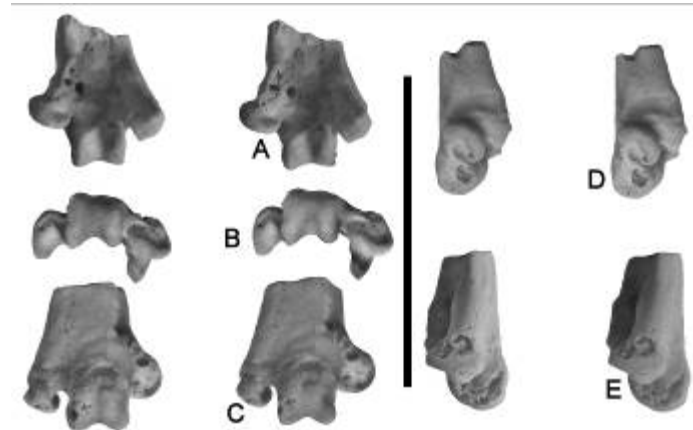
Martin Pickford & Brigitte Senut, Muséum - National d'Histoire Naturelle, Paris.

Brigitte and Martin have been active in Southern Africa searching for new fossil localities and 2013 proved to have been an exceptional year. Starting in the Sperrgebiet in March, survey of potential palaeo-targets observed on Google Earth, led to the discovery of by far the richest Eocene micro-mammal locality in Africa. The site is a partly silicified limestone deposited by a hard-water spring. Now cropping out as a roughly circular mesa called Eocliff, it contains about a million tons of fossiliferous limestone, abounding in plant traces, rodents, chrysochlorids, macroscelids and tenrecids as well as yielding rarer birds, squamates and crocodiles. A million tons sounds a lot, but the outcrop is minute at the scale of the continent: it is a cylindrical mass 150 metres in diameter and 15 metres thick. Already, that's a small site by any standards.



Eocliff site with Brigitte & Helke

A nearby deposit called Eoridge contains freshwater snails and chelonians. How many other "small" deposits occur in the region? Only further surveys will reveal. On Google Earth several other areas with a similar "pixel signature" have been identified in the northern Sperrgebiet (Pomona environs), some of them only 40 metres in diameter.



Eocliff - Parrot tarsometatarsus



Eocliff - Prepomonomy

In early November, Martin went to Gorongosa Park, Mozambique, to search for fossils and found a petrified forest of basal Miocene age on the eastern shoulders of the Urema Rift Valley.



Gorongosa fossil tree

The stone trees occur in palaeopan deposits of the Mazamba Formation at Mhengere Hill. Nearby, marine fossils (molluscs, mammals) were recovered from the overlying Inhaminga Sandstone possibly of Middle Miocene age. These marginal marine deposits lie about 100 metres above sea-level and 150 km inland from the coast. The southern extremity of the

African Rift Valley in Mozambique thus records evidence concerning the interplay between Miocene rift tectonics and sea-level changes.

In late November, a brief trip to Etosha, Namibia, by Martin and Helke Mocke (Geological Survey of Namibia) led to the discovery of new fossils sites in the Ekuma River Valley in the northern part of Etosha Park. These deposits, aged ca 4 Ma, yield abundant bovids, equids, birds and fish (including lung fish) as well as suids, elephantids, rhinos, giraffids, hippos, hyaenids and aardvarks.

A piggy-back trip to Kaokoland resulted in the discovery of Middle to Early Pliocene fossils in spelean deposits associated with Waterfall Travertines in the Oruvandje and Warmquelle regions. The most interesting deposits were found at Okozonduno: 1 kg of limestone breccia collected from the base of a small cave in the travertine yielded a rich and diverse fauna of Pliocene age comprising fish, frogs, snakes, lizards, birds, rodents, macroscelidids and bats. Among the rodents is the extinct genus *Stenodontomys*, first recorded from Makapansgat and Langebaanweg, South Africa.



Okozonduno Cave in travertine

There are several waterfall travertines in the area perched high above the present day valley bottoms, but there was not enough time to examine all of them. The potential for further palaeontological discoveries in Kaokoland is high as is the palaeoclimatic interest of the deposits, which attest to a more humid climate in the region during the Pliocene (cf Miombo Woodland) than occurs there today (Mopani Woodland bordering on hyper-arid desert). Study of these travertines and their palaeofaunas will throw a great deal of light on the timing, rates and processes of geomorphological development of the region.

John Anderson - Pretoria

Heidi M. Anderson-Holmes

Honorary Research Associate (Palaeobotany), Evolutionary Studies Institute, University of Witswatersrand.
(46 Kurrajong St. Dorrigo, NSW. Australia 2453)

'Molteno Sphenophytes: Late Triassic biodiversity in southern Africa'

Writing books in one's 'retirement' has its definite advantages. One can choose where to sit and do one's work for a start, as the two accompanying 'action' photos aim to suggest. Six-floors up at The Strand there sits Heidi, with the sea lapping below and Table Mountain in the background across False Bay.



And here I sit in the lounge at home in Pretoria with our garden forest thick around me. The photos are current, taken a day or two apart, showing us each in the throes of completing our Molteno horsetail volume.



But my 'office' has been anything but stationary. It's moved far and wide, from London looking out across the Thames valley, to southern Switzerland looking out onto Lago Maggiore, and from San Lameer beside the sea south of Durban, to near Stellenbosch amongst the mountains and the vineyards. Heidi's 'office' has likewise been fluid, from her home in Dorrigo on the scarp between Sydney and Brisbane, to further sites in Australia and still others here in South Africa.

And one can choose just when to focus on what. The volume has been on the go these past five years--since June 2008 when I retired from SANBI (South African National Biodiversity Institute). But there's been a whole lot of other

projects going on through this same span. I've been busy a good part of the time on Maarten de Wit and my 'Corridors' initiative, with our first two books, '*Africa Alive Corridors*' (an overview) and '*The Homo sapiens Corridor*' (our human story along the Cape coast) nearing publication. And Heidi's completed a run of papers with husband Keith Holmes on the important Middle Triassic Nymboida flora of New South Wales.

We have now settled on mid-March (2014) as our '*Molteno Sphenophyté*' deadline, with publication through the "Evolutionary Studies Institute (ESI) at Wits later in the year; so do keep an eye open. Then there's a handful more volumes to round off the floral and faunal picture of the Molteno! And along the way a quartet of grandkids have filled out the corners of our world!

John M Anderson (Pretoria, 5 Feb 2014)

A bit more from **Heidi Anderson - Holmes**

The Volume, together with John Anderson, describing the Sphenophyta of the Molteno Formation is almost ready for publication. With co-author Keith Holmes we published Part 9 describing the Coniferophytes of the Middle Triassic flora from Nymboida Basin of eastern Australia. Also published was a very useful synthesis of the Nymboida Flora. As a member of the Palaeobotanical Nomenclatural Committee I spend time on-line discussing motions of name conservation etc.

Holmes, W.B.K. and Anderson, H.M. (2013). The Middle Triassic megafossil flora of the Basin Creek Formation, Nymboida Coal Measures, New South Wales, Australia. Part 9. The genera *Heidiphyllum*, *Voltziopsis*, *Rissikia* and affiliated cones and ? *Yabiella*. Proceedings of the Linnean Society of NSW. 134, 55-76.

Holmes, W.B.K. and Anderson, H.M. (2013). A synthesis of the rich Gondwana Triassic megafossil flora from Nymboida, Australia. In *The Triassic System*, eds Tanner, L.H., Spielman, J.A. and Lucas, S.G. New Mexico Museum of Natural History and Science, Bulletin 61, 296-305.

SAHRA matters



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It was felt that the last meeting between the PSSA executive and SAHRA's APM Unit raised some very important issues that need to be communicated to the PSSA membership. To this end, SAHRA has drafted an article based on the discussions held in the meeting.

Dear PSSA Membership,

SAHRA's APM Unit and the PSSA Council held a meeting on 23 August 2013 to discuss a number of matters pertaining to the management of palaeontological heritage in South Africa. Some of the issues raised are new while others have been discussed on previous occasions. Below, I have summarized some of the most important matters that were covered.

Statutory requirement for obtaining landowner permission for permits - Discussion

It was noted that SAHRA had issued a letter dated 4 February 2013 in response to the issues raised during a meeting between SAHRA's APM Unit and the PSSA members in September 2012. With regards to obtaining landowner permission, many applicants are still submitting permit applications without prior approval from the relevant landowner. SAHRA has investigated this matter in terms of the relevant legislation including the Public Administrative Justice Act and the South African Constitution. SAHRA's conclusion is that landowner permission is still required in terms of the relevant legislation and in terms of the constitution.

Prof. Bamford raised concerns regarding the time delay and administrative burden that the requirement for landowner permission places on permit applicants. Furthermore, she felt this was the primary obstacle in the application process as the landowners are often very hard to reach or even identify. Mrs Scheermeyer indicated that planning is required for all field work and research activities. This planning must take getting landowner permission into consideration. Although this requirement places an administrative burden on both the applicant and the heritage authority, the two parties must comply with the law.

Mr Wiltshire added that the permitting process was primarily created to ensure that proper record keeping would take place rather than to stymie or inhibit research. Therefore, besides the legal requirements of the NHRA, all relevant information is required as it promotes further research.

Other legislation also requires landowner permission; for example mining, developments and other kinds of permits. Applicants involved in these sorts of projects are currently complying with this requirement.

SAHRA's Response

There are a number of ways that a landowner may be contacted. Landowner permission is required in ANY action that will impact on a person's property. Environmental Assessment practitioners must get landowner permission before investigating the viability of a development, mining companies must get landowner

permission before investigating the viability of a mine, archaeologists and palaeontologists must get landowner permission before applying for a permit.

We understand that this may be time consuming. However, the time to consult the relevant landowners must be included in your project planning. It should be noted that the larger the area is for which you are applying for a permit, the more landowners you will have to contact.

One option is to contact the local authorities in the areas you wish to work. Local authorities often have the contact details for landowners in their municipality. Alternatively, contact the relevant deeds office. There is a website

(www.mydeedsearch.co.za) that charges a minimal fee for access to the contact information of specific landowners.

If you have exhausted all of these options and are still not able to contact a landowner, please contact our offices so that we may try and assist you. We are building up a database of landowners' details on SAHRIS across the country along with a fully searchable history of permit applications on the SAHRIS maps. As more data is fed into SAHRIS it will become easier and easier to automate the application process.

A letter or an email from the affected landowner(s) is sufficient. Alternatively, the landowner could register on SAHRIS and give a short, positive comment on the relevant application. This can all be done online now before you have left for the field.

A permit holder can hold more than one permit simultaneously and permits are granted for a maximum three year period. Permits are required for any excavation or collection of fossil material, as well as any destructive analysis and the export of palaeontological material.

Collection of fossils without a permit - Discussion

It was noted that, at the meeting in September 2012, there was much discussion around the necessity for permits from SAHRA for the collection of palaeontological material. Permits are issued for a specific purpose for a specific site to a specific person. It is not always best practice to collect fossils - in some instances, it may be more appropriate to leave fossils *in situ*. Dr. Zipfel indicated that he has previously attended an "In situ preservation" workshop. Concern was also raised around the illegal collections amassed by amateur fossil collectors for sale. The question was raised as to whether it is within SAHRA's jurisdiction to deal with illegally collected fossils from other countries for sale in South Africa. It was confirmed that, in terms of the NHRA (Act 25 of 1999), a permit from the country of origin is required for the import of fossil material, and therefore it is SAHRA's responsibility to ensure this is enforced. It is important to note that SAHRA can fast track emergency permit applications in extreme circumstances where fossils are imminently in danger of being destroyed, however this must only be in exceptional circumstances. If this situation arises, SAHRA must be contacted immediately with details of the fossil and the imminent danger it is in before it can be

collected. Contact details of suspected illegal collectors must be sent to SAHRA so that they can be investigated and prosecuted.

Permitting for large areas (blanket permits) - Discussion

It was noted that in the past, SAHRA had issued permits for the collection of fossils over large areas. The larger the collecting area, the more difficult it is to obtain landowner permission. In past years, blanket permits were accepted practice, however, this is not necessarily the best practice for site management. SAHRA regularly updates its policies to align itself with best practice and international standards.

Prof. Bamford felt that blanket permits are necessary for some research projects. It is often more convenient to carry out collection at the same time as the survey.

Mrs Scheermeyer noted that in exceptional instances, and only with sufficient motivation, will SAHRA consider issuing blanket permits for research. However, the unpermitted collection of fossil material during the Phase 1 stage of the impact assessment process in terms of Section 38 of the NHRA has major legal ramifications. Developers who must comply with the mitigatory sequence set out in Section 38 cannot demonstrate due process if Phase 2 work is done illegally.

Mr Wiltshire pointed out that the land owner approval obstacle is already handled by the developer and/or the Environmental Assessment Practitioner for most impact assessments. It is therefore much less of an issue for palaeontological permits as the approval has already been granted for the proposed development.

Dr Bamford indicated that there are still archaeologists conducting palaeontological impact assessments. Miss Lavin indicated that SAHRA has made a concerted effort to refuse palaeontological impact assessments conducted by non-palaeontological specialists. Mr Wiltshire suggested that the PSSA should register with SAHRA as a conservation body to comment on cases.

Dr Bamford noted that there have been serious administrative issues with the Eastern Cape PHRA. Mrs Scheermeyer indicated that SAHRA is aware of these issues which have subsequently been resolved. The issues experienced at the Eastern Cape PHRA have also highlighted gaps in the devolution process which must be addressed.

SAHRIS and Data Security - Discussion

A short presentation of the Organic Groups (OGs) features on SAHRIS was made by Mr Wiltshire. Organic Groups were enabled on SAHRIS to solve the problem of recording certain categories of data which required an additional layer of security such as the GPS coordinates of palaeontological sites. OGs also facilitate the management of these rights by the users "organically" rather than positioning the staff of SAHRA as gatekeepers to this data.

The creation of Group Audiences was demonstrated which contain the group members who have permission to create and edit sites relevant to a research group, institution or owner.

Two basic visibility options are available:

- Sites set to "Private" will only be visible to members of the specified Organic Group Audience
- Sites set to "Public" will be visible to anybody logging onto the website

Most archaeological and palaeontological sites are most appropriately set to "private" to prevent the dissemination of coordinate data without the owner and recorder(s) consent.

Organic Groups are self-managed by the administrative members of the group and do not require SAHRA's intervention to control access in and out of the groups.

Organic groups are also a useful way of organising data collected by a particular research group even if the public mode of entering the sites is used. There are menu options on SAHRIS to view the sites which belong to your group rather than having to necessarily scroll through everyone else's sites. Some permit applicants had not fully comprehended or understood the use of the Organic Groups and were concerned about the publication of site coordinate data on the web through SAHRIS. Once sites have been properly entered on SAHRIS in OG groups the coordinate data is secure and there is no need to include the coordinates in permit reports or applications. This is one of the primary reasons applicants are compelled to complete the site records on SAHRIS as part of the application process.

Permit Applications: Sites and Objects - Discussion

It was noted that it is still a challenge getting people to make permit applications with the correct site or object information. Issues have been raised regarding the way the form looks and when it is completed. This is not necessarily as clear on the SAHRIS system as it has been in the past as the content types are structured differently to the old forms.

Mr Wiltshire noted the frustrations with the new system and indicated that they are to be expected with such major changes to the process. Mr Wiltshire has developed a Wizard-driven approach to the SAHRIS permit application system which is intended to simplify the process of applying for a permit on SAHRIS.

Dr. Zipfel voiced concerns regarding SAHRA issuing export permits without a loan number from the curating institute. This loan number is indicative of a loan agreement and the fulfillment of SAHRA's permit requirements. Mr Wiltshire pointed out that Museum Collection Management can be done through SAHRIS, and encouraged the Wits collection to be placed on the system. The collections from Groote Schuur, National Museum Bloemfontein and NALN are already on SAHRIS. UCT and Amafa's sites databases are also on SAHRIS.

Dr. Zipfel queried whether there is space for sufficient motivation to be communicated through the SAHRIS permit application process.

Mr Wiltshire noted that SAHRIS has included a field for an expanded motivation.

SAHRA will insist on loan number from curating institute for the export of fossil material. A suggested policy change must be investigated that only curators be permitted to apply for export permits.

Mr Wiltshire has added an applicant status flag: "Draft", "Submitted" and "Studies Submitted" to the SAHRIS Case process.

SAHRA Response

In Heritage Resources Management, there is a complex relationship between sites, objects and cases. Sites are the places that heritage resources are located. All heritage objects, such as fossil specimens, originated at a palaeontological site. When the fossil (object) is recorded on the SAHRIS system, we are also recording its site of origin. More than one object can come from a site.

Cases can be permit applications to do research, permits to mitigate impacts to sites, permits to export objects or applications for developments. More than one object can be linked to a case and more than one case can be linked to an object. In the same way, more than one site may be linked to a case and a site can be linked to more than one case.

Because of this relationship, SAHRIS is designed to record the information on sites, objects and cases separately. While at first this will create a slight administrative burden on people making applications for permits, all the site and object data recorded is stored and, as such, will not have to be recorded again.

The site recording process will be mandatory for permits and impact assessments from 1 January 2014.

Permit Reports - Discussion

It was noted that the quality of the permit reports received by SAHRA is poor. With increased capacity, SAHRA is able to start insisting on higher quality reporting on permits. SAHRA acknowledges a gap in the communication of information requirements for permit reports and is working on addressing this. SAHRA is in the process of drafting a permit reporting policy to include sites, objects and the kinds of information necessary in permit reports.

Outstanding Specimens - Discussion

Dr. Zipfel indicated that a number of specimens exported under SAHRA permits have not been returned as required. It is unclear whether SAHRA has received the required permit reports for these specimens.

Mrs Scheermeyer noted that SAHRA will be able to check up on outstanding permit reports and exported specimens once all SAHRA's permits have been digitized. She acknowledged that there is a gap in available information.

Mr Wiltshire indicated that, through SAHRIS, a system and structure are in place to determine what was sent out.

Dr. Zipfel noted that often specimens are exported mainly for convenience. Strict protocols should be in place for the export of specimens including IP agreements. Dr. Zipfel indicated

concerns of the PSSA membership regarding the misappropriation of intellectual property and theft of data. SAHRA will follow up on outstanding permit reports and outstanding exported specimens.

Provincial Management of Palaeontology - Discussion

Dr. Zipfel reiterated the concern of some members of the PSSA regarding the management of palaeontological resources at Provincial level.

Miss Lavin indicated that the legislation is quite unambiguous in that the PHRAs are responsible for palaeontology within their provinces once they have successfully applied for those competencies.

Mr Wiltshire noted that SAHRIS standardizes and simplifies the heritage management process across the three-tier management system. The idea behind SAHRIS was that the same application and management methodology can be applied to all provinces and local authorities through SAHRIS.

Dr. Zipfel indicated his concern that palaeontological material must be curated in the province of origin.

Mrs Scheermeyer corrected Dr. B. Zipfel and indicated that no hard and fast rule exists regarding the curatorship of material.

SAHRA Response

The legislation is quite clear in that the general protections in the National Heritage Resources Act (Act 25 of 1999), including the protection of palaeontological resources under Section 35, should be managed by Local Authorities who have been deemed competent. If a local authority cannot prove competency in

terms of Section 35 of the NHRA, the responsibility for managing this general protection falls to the relevant provincial heritage resources authority (PHRA). If the PHRA cannot prove competency in terms of Section 35 of the NHRA, the responsibility for managing Section 35 then falls to SAHRA. As the only PHRAs that have competency in terms of Section 35 are HWC, Amafa and the ECPHRA, the management of Section 35 in the North West, Limpopo, Mpumalanga, Northern Cape, Free State and Gauteng falls to SAHRA.

With SAHRIS, SAHRA is able to assist with the management of palaeontological cases at a PHRA level and vice versa.

Destructive Sampling - Discussion

Dr. Zipfel raised the question as to whether the destructive sampling of low significance resources requires permitting.

Miss Lavin indicated that permitting is required for the destructive sampling of all grades of resource as the legislation does not discriminate between significant and non-significant palaeontology.

A solution was presented in that if SAHRA is informed prior to the application being made, staff have delegations to decide on the permitting of the destruction of these non-significant resources. This can be done in a relatively short amount of time as the APMHOB Permit Committee does not need to be consulted.

Overall, the discussion with the PSSA Council members was informative and enlightening. Many areas in which SAHRA can improve were identified and it was agreed that continued co-

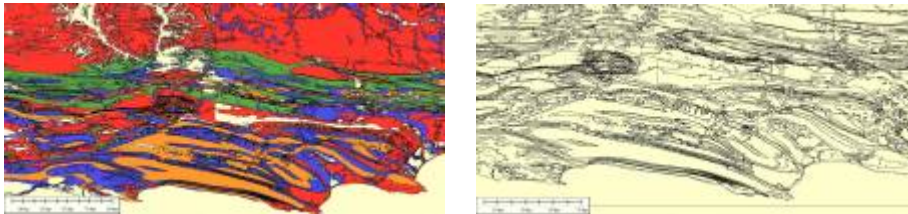
operation between the heritage authorities and professional palaeontologists would assist the growth and development of palaeontological research and the improved protection of palaeontological resources in South Africa.

To be included in a complete permit application

Please note that SAHRA will not process incomplete applications. The following information must be included:

1. Proof of Landowner Permission
2. Create the site(s) or object(s) on SAHRIS
3. Proof of payment for research or mitigation permits
4. Adequate description of proposed action and motivation
5. If an object for export or destructive sampling, then a loan number/loan agreement from the curating institute
6. If a site, then a letter from the proposed repository indicating agreement to curate the excavated material.
7. If the application is work at a National Heritage Site, a full research proposal must be included along with a site plan

Release of the South African National Fossil Sensitivity Map through SAHRIS by SAHRA and the Council for GeoScience



The fossil sensitivity map is an important step forward in the proactive management of palaeontological and geological heritage resources. The map will guide and assist developers, heritage officers and practitioners in screening palaeontologically sensitive areas at the earliest stages of the development cycle.

PalaeoTechnical Reports

The successful development of the sensitivity map owes itself to a number of initiatives and partners. Since 2008, SAHRA, Heritage Western Cape and Amafa/Heritage KwaZulu-Natal have commissioned palaeotechnical reports from expert palaeontologists such as Dr John Almond, Dr John Pether and Dr Gideon Groenewald. These reports have been used by heritage officers across the country to assess the impacts on fossils by developments. However, this process has been

extremely cumbersome and time consuming as the fossil bearing formations were not georeferenced so that footprints of applications could be overlaid systematically against the sensitive geological formations. This information was also not readily accessible by members of the public unless they explicitly requested copies of the palaeotechnical reports.

Council for GeoScience & SAHRIS

The successful development of SAHRIS in 2012 opened up a range of possibilities to automate access to and dissemination of the valuable information contained in the palaeotechnical reports. Furthermore, a number of provinces had only been partially assessed (or not at all). The extraction of the technical information onto a Geographical Information System (GIS) provided a means to eliminate gaps in the sensitivity maps where geological formations overlapped provincial boundaries.

SAHRA approached the Council for GeoScience (CGS) in order to access to their 1:250 000 geological shapefile data. The CGS were happy to collaborate and on 19 September 2013, SAHRA and the CGS signed a license agreement for the use of their data. Over the last few months, SAHRA's palaeontological heritage officer, Ms Jenna Lavin, has combined the Palaeotechnical Report information with the shapefile data on SAHRIS and has developed a Fossil Sensitivity Map for South Africa.

Fossil Sensitivity Map

This map is available on the SAHRIS mapping system as a layer that can be switched on and off. The different colours on the map represent different levels of estimated palaeontological sensitivity.

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Fossil Heritage Layers

The map can be used in conjunction with the inventory of Fossil Heritage Layers on SAHRIS (<http://www.sahra.org.za/fossil-heritage-layer-browser>). This data has been taken from the

Palaeotechnical reports compiled by Dr Almond, Dr Pether and Dr Groenewald and provide information on the kinds of fossil heritage known from geological formations in South Africa as well as the approximate age of the formations and the fossil sensitivity of the formations. The palaeotechnical project is continuing and as more information is provided, the Fossil Heritage Layers will be updated with new information.

It is SAHRA's hope that this information will assist in the proactive management of South Africa's palaeontological heritage and provide a new insight into South Africa's unique heritage. This map can be utilised by the South African public, learners and researchers alike. Most importantly, this map can be used by developers as an early-warning system for potential impacts to significant palaeontological heritage.

For more information, contact:

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or **Katie Smuts** (SAHRA National Inventory Unit)
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Conferences, Recent fossil discoveries and press releases.

"FROM PAST TO PRESENT"

Changing Climates, Ecosystems and Environments of Arid Southern Africa. *A Tribute to Louis Scott*
- Bloemfontein 7-11 July 2014 -

Louis Scott (Dept. of Plant Sciences, University of the Free State), is one of the leading scholars in the world in the fields of Quaternary Palaeobotany and Palaeoecology and has made an outstanding contribution to teaching and research in South Africa and on the international front. Louis has recently retired, but is continuing his active research career. We wish to announce a conference to celebrate Louis' contribution to palaeoscience and to the natural sciences in general, and would like to invite professionals and students working in these fields. The programme includes a two-day post-conference excursion to fossil sites in the central and western interior of South Africa.

Venue

Main Campus, University of the Free State, Bloemfontein, South Africa

Programme

7 July 2014 - Evening function & opening with keynote speaker
8 July 2014 - Academic sessions/ conference dinner

9 July 2014 - Academic sessions/ closing evening reception
10 & 11 July 2014 - Post-conference excursion to fossil sites in the central & western interior

Important dates

28 August 2013 - 1st announcement

29 November 2013 - call for titles & abstracts; online registration opens

30 April 2014 - abstract submission closes; early bird registration closes

17 June 2014 - online registration closes

For more information: <http://lscott-tribute.co.za>

Fun fact:

**The average human body
contains enough bones**



to make an entire human skeleton.



The Royal Canadian Mint has released a limited edition coin of *Tiktaalik roseae* that GLOWS IN THE DARK!

Tiktaalik roseae was a fish that lived 417-354 million years ago and is critically important, as it helps to explain how animals made the transition from water to land.

The Royal Canadian Mint is commemorating this important fossil with a limited edition 25 cent coin that GLOWS in the dark. In the light, *Tiktaalik* is viewed as it may have looked when it was alive, but the glowing skeleton is revealed as soon as the lights go out. Check it out here: <http://bit.ly/1jd58MA>

Geological Society of London blog. (Thanks to Emese Bordy) A love song to dinosaurs. This wins bonus points for managing to work in some palaeobotany, and the ability to draw dinosaurs backwards. Enjoy! <http://blog.geolsoc.org.uk/2013/12/01/door-one/>



This boning dinosaur skeleton exhibit is proof that American museums are too prudish. Europeans have all the fun: lower drinking ages, funner (sic) beaches, easier lifestyles and... dinosaur skeletons having sex in their museums. This exhibit, which clearly shows two T-Rexes "mating", is located in the Jurassic Museum of Asturias in Spain. <http://gizmodo.com/5850248/this-boning-dinosaur-skeleton-exhibit-is-proof-that-american-museums-are-too-prudish>

Not the End of the World: Why Earth's Greatest Mass Extinction Was the Making of Modern Mammals

Aug. 28, 2013 — The ancient closest relatives of mammals -- the cynodont therapsids -- not only survived the greatest mass extinction of all time, 252 million years ago, but thrived in the aftermath, according to new research published today (28th August).

Feathered dinosaurs had 'flight-ready' brains

<http://www.bbc.co.uk/news/science-environment-23514985>

Why pterosaurs weren't so scary after all

These flying reptiles are traditionally seen as scaly, ungainly beasts, but the discovery of new fossils has led to some surprising findings.

<http://www.theguardian.com/science/2013/aug/11/pterosaurs-fossils-research-mark-witton>

Megaconus mammaliaformis

Cute early mammal that lived with the dinosaurs had poisoned spurs to defend itself. A furry ferret-like creature with poisonous spurs on its hind legs for defending itself from predators has been unearthed as an early ancestor of mammals as they evolved from reptiles.

<http://www.telegraph.co.uk/science/evolution/10229472/Cute-early-mammal-that-lived-with-the-dinosaurs-had-poisoned-spurs-to-defend-itself.html>



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