

# DIRECTOR'S REPORT FOR THE PERIOD

January–December 2005

**NAME OF RESEARCH ENTITY:**

Bernard Price Institute for Palaeontological Research

**NAME OF DIRECTOR:**

Professor BS Rubidge

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With devolution of the administration of research entities to Faculties rather than the Research Office, a written annual report is no longer required by the University. However for our own records it is useful to document the activities of the BPI Palaeontology on an annual basis, as otherwise there is a real risk that important details of Institutional history will be lost sight of and disappear from memory.

## 1. STAFF

### 1.1 BPI Palaeontology Staff

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#### 1. 1.1. ACADEMIC STAFF in research entity on 31 December 2004

Designation	Name	Grade	R	G	D	Birth date	Retirement/ termination date	Comment (% appointment, etc)
Professor	Rubidge B.	NS05	W	M	-	1 Jun 1956	1 Jun 2016	BPIPAL 66% URC; 33% FOC
Senior Researcher	Bamford M.	NS07	W	F	-	25 Oct 1961	25 Oct 2021	BPIPAL 66% URC; 33% FOC
Reader	Berger L.	NS06	W	M	-	22 Dec 1965	22 Dec 2025	Science Faculty, 33%, URC paid 66%
Researcher	Renaut A.	NS08	W	M	-	19 Mar 1969	31 Apr 2004	BPIPAL 66% URC; 33% FOC
Researcher	Yates, A	NS08	W	M	-	13 Mar 1972	13 Mar 2032	Replaced Alain Renaut URC paid
Researcher	Backwell, L	NS08	W	F		2 Sep. 1966	1 Oct 2025	Science Faculty 100%

#### 2. 1.2. SUPPORT STAFF in research entity on 31 December 2004

POSITION	SURNAME		R	G	D	DATE OF BIRTH	RETIRMENT/ TERMINATION DATE	COMMENT
Snr admin secretary	Thobois J.	SE11	W	F	-	28-Jul-70	2030	BPI Pal
Curator	Raath, M.	AD06	W	M	-	11 Feb-41	31-12-2006	UNIVERSITY URC-FUNDED
Principle technician	Costopoulos W.	AD08	W	M	-	09-Feb-62	2022	BPI PAL; URC-FUNDED
Technician fossil prep	Dube C.	AD12	B	M	-	25-May-65	2025	BPI PAL; URC-FUNDED
Technician fossil prep	Mbense D.	AD13	B	M	-	17-Feb-76	2036	BPI PAL; URC-FUNDED
Technician fossil prep	Ntheri N.	AD13	B	M	-	08-Jun-74	2034	BPI PAL; URC-FUNDED
Technician fossil prep	Mukanela	AD13	B	M	-	10-Nov-53	2013	BPI PAL; URC-FUNDED
Technician fossil prep	Sithole J.	AD13	B	M	-	28-Oct-74	2034	BPI PAL; URC-FUNDED
Technician fossil prep	Tshabalala S.	AD13	B	M	-	06-Apr-73	2033	BPI PAL; URC-FUNDED
Technician fossil prep	Ndlovu, G	AD13	B	F				BPI PAL; URC-FUNDED
Cave Custodian, Makapansgat	Maluleke, J.	AD17	B	M	-	01-Jan -52	01-01-2012	BPI PAL; URC-FUNDED

3. 1.3. POST-DOCTORAL STAFF in research entity on 31 December 2005

	POSITION		SURNAME	TITLE	G	GROUPING	COUNTRY	TERMINATION	YEAR
CP00	Post doc fellow	F	Abdala	Dr	M	Bpipal	Argentina	30-June	2006
CP00	Fix term contract res.	I	Mckay	Dr	M	GeoS	SA	31-March	2006
CP00	Fix term contract res		Hancox					28 Feb	2006

4. 1.4. Changes in staff establishment in research entity during 2005

Academic staff

Name	Grade	R	G	D	New appointment (give month)	Promotion (give date)	Retirement (give date)	Resignation (give date)

Support staff

Name	Grade	R	G	D	New appointment (give month)	Promotion (give date)	Retirement (give date)	Resignation (give date)
Ndlovu, G	13	B	F					

Jacqui  
Constance

1.3 Honorary Staff and Associates

Hon Professor of Palaeo-anthropology  
Hon Research Associates

Prof P.V. Tobias  
Dr C.K. Brain  
Dr F.E. Grine  
Dr J.M. Maguire  
Mr I.R. McLachlan  
Prof C Sidor  
Mr R. Murzl

Hon Warden, Makapansgat Cave Sites

2. RESEARCH UNDERTAKEN DURING 2005

2. Current research projects and results achieved

2.1. Dr F. Abdala

2.1.1 Description of a new species of Trirachodontid (from Subzone A of the *Cynognathus* Assemblage Zone), including a cladistic analysis of gomphodont cynodonts. The manuscript by Abdala, Neveling, and Welman is in press in the Zoological Journal of the Linnean Society.

2.1.2 Re-description of *Parathrinaxodon proops* from the Late Permian of Tanzania, with a discussion about the palate in Late Permian cynodonts and an faunal comparison

between the Late Permian Kawinga fauna of Tanzania and Karoo Late Permian faunas. The manuscript by Abdala and Allinson is in press in *Palaeontologia africana*.

- 2.1.3 Description of the world's oldest cynodont. A cynodont fossil was recently discovered from the *Tropidostoma* Assemblage Zone of the Karoo Basin by Roger Smith. This is the oldest cynodont yet discovered and is being described in collaboration with Jennifer Botha (National Museum), and Roger Smith (South African Museum). Submitted to the *Zoological Journal of the Linnean Society*.
- 2.1.4 Ontogenetic studies on the australidelphian marsupial *Dasyurus albopunctatus*. A qualitative and quantitative approach to the cranial ontogeny of this Australasian marsupial was compared with those of some South American previously studied for us, under the same framework. The ms by Flores, D.A., Giannini, N.P. and Abdala, F. is in press in the *Journal of Morphology*.
- 2.1.5 Re-description of *Platycraniellus elegans* including a phylogeny of cynodonts. This highly delayed project is soon to the end now. I added an integral phylogeny of Late Therapsids, including Therocephalians, Non-mammaliaform cynodonts and basal Mammaliaformes. The ms will be submitted early this year.
- 2.1.6 Description of new pareiasaurid material from the Brazilian Late Permian with its implications for Late Permian biostratigraphy was published by Cisneros, J.C., Abdala, F. and Malabarba, M.C. in the *Revista Brasileira de Paleontologia*.

## 2.2. Dr L Backwell

- 2.2.1 Early hominid bone tools. Ongoing research conducted on the identification and use of early hominid bone tools in collaboration with Dr. Francesco d'Errico at the University of Bordeaux. In 2005 we described new tools from Drimolen, and used an interferometer to acquire 3D features to quantify surface roughness, and compare results between sites, on experimental bone tools used in different tasks, and bones modified by non-human agents and processes.
- 2.2.2 Fossil hair. A total of 40 fossil hairs were extracted from a single hyaena coprolite dated to 177 – 257.5 ka. Six hairs preserve identifiable cuticle patterns. The fossil hair and reference material, including modern human hair and indigenous primate and hyaena hair collected at the Mammal Department, Transvaal Museum, was examined and photographed using scanning electron microscopy.
- 2.2.3 Cut-marks on fossil human remains. Experimental butchery was conducted on cow and sheep limbs to verify cut- and impact marks recorded on fossil human remains. Scanning electron microscope images were taken of fossil and experimentally created features.

For projects 2.2.4 and 2.2.5 excavations were undertaken at two inland South African sites; Wonderkrater and Heelbo. My goal was to explore the deposits, evidence of early modern human behaviour, site formation processes, and the role of archaeology

and palaeontology in calibrating environmental sequences of climate change in inland southern Africa. This research forms part of a three year study funded by an NRF Thuthuka Women in Research Grant.

- 2.2.4 Wonderkrater peat mound. In the first field season we found artefacts at depths that do not correlate with previously proposed radiocarbon dates. This calls for re-dating of the deposits (peat, bone, charcoal) using radiocarbon dating, and reassessment of the pollen sequences. Excavated material was sorted and sent for dating and isotopic analysis. Organic remains were dried and lithics preliminarily identified.
- 2.2.5 Heelbo donga site. Excavated remains requiring preparation were cleaned and curated. In the first field season we found what appears to be evidence of a game drive. Preliminary results show that approximately 60 black wildebeest are recorded in association with a fire place.
- 2.2.6 Termites and early hominid diet. Isotopic analysis was conducted on aardwolf (*Proteles*) teeth from Swartkrans Members 1-3 to establish Plio-Pleistocene termite values. A modern aardwolf from the Sterkfontein Valley was also analysed for current values in the region. These data form part of an ongoing study made in collaboration with Nick van der Merwe.
- 2.2.7 Taphonomy of Cooper's D assemblage. Set up and started a flow-through system with Professor Ewa Cukrowska and Steven Pole (PhD. Candidate, Chemistry), for chemical removal of manganese dioxide coatings from fossils.

### 2.3 Dr M Bamford

#### 2.3.1 Karoo Fossil Woods

Continued adding to the Karoo wood database to check for any new taxa, refine the biostratigraphy of the woods and modify as necessary. Several samples from Anthony Rutherford's project were sectioned and identified and are reported in his thesis.

#### 2.3.2 Karoo palaeobotany:

The project funded by the NSF (USA) and in collaboration with Dr Hallie Sims, Dr Conrad Labandiera, and Prof Bob Gastaldo of the Smithsonian Institution, Washington DC, USA, was continued by way of laboratory work as Dr Sims was unable to come to South Africa for fieldwork. A paper was published in *Palaios* on the taphonomy – see Gastaldo et al. 2005 in the publications list.

#### 2.3.3 Cretaceous and Tertiary Woods

The Vryburg and Mahura Muthla fossil woods were compiled into an internal report for De Beers for John Ward and Mike de Wit. The paper for South African Journal of Geology is in advanced stages of preparation.

- 2.3.4 A new 3 year project with NRF-SIDA funding with Drs David Cantrill and Hervé Sauquet began in June with field work at Kleinsee to collect Late Cretaceous and Cenozoic pollen and fossil wood. We also visited the collections housed in the South African Museum

- and Albany Museum. Hervé and I gave talks to the Rhodes Botany Department.
- 2.3.5 In February I was invited to join Prof Jack Harris and the Rutgers University team to look for fossil wood in several Plio-Pleistocene sites in Koobi Fora and Ileret, west of Lake Turkana, Kenya. I collected 395 samples and have sectioned and identified 95 of them. Preliminary results will be presented at the African Genesis Conference, Wits, January 2006 and the American Palaeoanthropology Society meeting in April, Puerto Rico. Two publications are in progress.
  - 2.3.6 Identification of charcoal from the Early Iron Age type site of Ndongondwane, Tugela Valley, KwaZulu Natal has begun as part of a spatial relations project headed by Prof Haskel Greenfield, University of Manitoba, Winnipeg, Canada. Several papers are planned and one is in progress.
  - 2.3.7 A new project to study the context of and the artefacts excavated from Wonderwerk Cave, Northern Cape Province, by Peter Beaumont, a multinational team lead by Dr Liora Horwitz, University of Jerusalem and Dr Alan Chasen, Canada, has begun and I have been invited to study all the botanical macro-remains (predominantly charcoal). I visited the site in November and have agreed to work through the large sample over the next few years.
  - 2.3.8 Only a small team carried out field work at Olduvai Gorge in July-August so very little new material was excavated. We continued our actualistic studies at Engolosin, Naibor Soit and Lakes Eyasi and Ndutu, and I had time to write up three papers (see Albert et al. in press; Bamford et al. in press; Bamford et al. submitted).
  - 2.3.9. No field work was carried out at Laetoli but the modern plants collected in 2004 have been identified and a paper submitted (Andrews and Bamford)
  - 2.3.10. Continued with building up a modern reference collection of plant materials (wood, leaves, seeds, pollen) from Seekoivlei, Okavango, Tsau and Kenya.

#### 2.4. Prof L.R Berger

- 2.4.1 Taphonomy - Continued laboratory and field work on eagle collecting behaviour and the taphonomic signatures left on prey items of raptors.
- 2.4.2 Functional Morphology – as part of an ongoing research programme – undertook detailed studies of the postcranial morphology of early hominins.
- 2.4.3 Continued research in collaboration with Dr. L. Backwell on fossil hairs from the Gladysvale site – South Africa.
- 2.4.4 Cut Marks – continued the ongoing research on human remains and possible cannibalism from sites in southern Africa.
- 2.4.5 Finalized comparative research of fossil canids from cradle of humankind sites.

- 2.4.6 Continued collaborative research on the morphology of fossil saber-toothed cats from the Coopers site – South Africa.
- 2.4.7 Undertook collaborative studies of the fossil *Theropithecus* fossils from the Coopers cave South Africa.
- 2.4.8 Undertook preliminary research and field trips to Botswana as planning for a 2007 expedition for human remains.
- 2.4.9 Undertook exploration for Early Mammal fossils in the Cretaceous and Early Palaeogene of Northern South Africa with S. Churchill and E. Hamilton
- 2.4.10 Continued excavations of the Coopers site, South Africa.
- 2.4.11 Continued excavations of the Gladysvale site, South Africa.
- 2.4.12 Continued an ongoing project of exploration and mapping of Miocene – Pleistocene aged deposits in the Free State, South Africa
- 2.4.13 Conducted continuing research and submitted a collaborative paper on the morphology of robust australopithecine specimens from Swartkrans – South Africa.
- 2.4.14 Finalized collaborative research on new stone tool material from the Gladysvale site – South Africa.
- 2.4.15 Finalized collaborative research on new stone tools from the Plovers Lake II site – south Africa.
- 2.4.16 Finalized collaborative research on new stone tools from the Coopers site – South Africa.

## 2.5 Dr P J Hancox.

Dr Hancox, who resigned from the position of Senior Lecturer in the School of Geosciences, joined the BPI Palaeontology on a postdoctoral fellowship in March 2006. Dr Hancox's work over the past ten years has focused on the rocks and fossils of the Burgersdorp Formation and its included *Cynognathus* Assemblage Zone. To this end the following projects will be completed in 2005:

- 2.5.1 Hancox *et al.*, (2005) proposed a potential threefold subdivision of the *Cynognathus* Assemblage Zone based on the presence at different stratigraphic levels of key mastodontosaurid amphibian taxa. In the past ten years this work has been added to and refined and will be written up in light of these new findings. Collaborators include: Professor B.S.Rubidge and Dr J.Neveling.

During the collecting for the above-mentioned project a number of new taxa were discovered, and these are to be described.

- 2.5.2 Description of a new erythrosuchid archosaur from the lowermost levels of the

*Cynognathus* Assemblage Zone. Collaborators include: Drs D.Gower and A.Sennikov.

- 2.5.3 In a short article in the mid-1990's Hancox and Rubidge (1996) described the first occurrence of the stahleckeriid *Angonisaurus* from the uppermost levels of the *Cynognathus* Assemblage Zone. In light of new discoveries and a re-description of the type, this material is to be given a full description and phylogenetic assessment. Collaborator: Prof. B.S.Rubidge.
- 2.5.4 Description of a new shansiodontid dicynodont from the uppermost levels of the *Cynognathus* Assemblage Zone. Collaborator: Prof. B.S.Rubidge.
- 2.5.5 The palaeoenvironments, taphonomy and palaeocology of the sites containing a *Cynognathus* subzone A fauna is to be written up for publication in *Palaeoclimatology, Palaeogeography, Palaeoecology*.

Dr Hancox will also work towards finishing a number of other projects with various collaborators including a number of postgraduate students. These projects focus mainly on cave stratigraphy and sedimentology, the Permo-Triassic boundary in the main Karoo Basin, Triassic sedimentary environments and dicynodont postcrania.

## 2.6 Dr M.A. Raath

- 2.6.1 Research Progress – The dinosaur eggs and embryos project (joint project with Prof Robert Reisz and his team from Canada, and in association with Golden Gate Highlands National Park) has taken several significant steps forward. A paper appeared in Science in July, and stirred up a great deal of international media interest. The Canadian team visited South Africa in April and excavated a new block of Elliot Formation mudrock which contains a group of at least seven eggs. The significance of this find is that they are the first in situ eggs, thus clearing up that aspect of their provenance. Dr Adam Yates will be taking over the BPI role in this project.

## 2.7 Prof B.S. Rubidge

- 2.7.1 Litho- and Biostratigraphy of the Lower Beaufort around the basin:  
During March 2005 a two week field excursion was undertaken to farms on the Ecca-Beaufort contact on the farm Bucklands in the Grahamstown area with John Nyaphuli (National Museum), Nthaopa Ntheri and Charlton Dube. On Bucklands John Nyaphuli discovered a rhinesuchid amphibian skull not far above the Ecca-Beaufort contact. Higher in the stratigraphy several dicynodont skulls were discovered and are currently being prepared.

In July 2005 Prof Rubidge was accompanied by Billy de Klerk and Rosie Ardendorff (Albany Museum) to undertake detailed mapping of the palaeosurface on the Ecca-Beaufort contact in the Estcourt district, and to make a cast of the best amphibian trackway. The draft of the manuscript has been updated, but de Klerk needs to do detailed research on the amphibian trackway.



- 2.7.2 Description of the postcranial skeleton of *Tapinocaninus*, a new primitive tapinocephaline dinocephalian. Bruce Rubidge has been preparing this skeleton since 1984, and Romala Govender described the specimen for her MSc which was successfully submitted at the beginning of 2002. GOVENDER R, RUBIDGE BS & RENAUT AJ are in the process of writing up two manuscripts for publication.
- 2.7.3 Taxonomic revision of the Dinocephalia (with Dr J A van den Heever, University of Stellenbosch) (ongoing project). The Dinocephalia are a large and important group of synapsids known only from southern Africa, China and Russia. This revision is a long-term project which will take a lifetime to complete, as the animals are large and take a long time to prepare.  
Taxonomic revision of the Anteosauridae. The paper is still in the hands of van den Heever who promised completion in 2004.
- 2.7.4 Taxonomic revision of the "Biarmosuchia". The "Biarmosuchia" are considered to be the most primitive therapsid taxon. Fossils of this group have been found in the Permian rocks of only South Africa and Russia. During 2005 Rubidge began with a description of the cranial morphology of specimens of *Hipposaurus* which he has on loan. During 2006 he will incorporate additional data from the holotype specimens in the South African Museum.
- 2.7.5 Description of new dicynodonts from the lower Beaufort Group. An exciting skull of a small dicynodont with postcanine teeth was collected in the lowermost Beaufort by Charlton Dube in the Prince Albert Road area. Honours student Zubair Jinnah described the skull as part of his honours project and decided that this was *Eodicynodon oosthuizeni*. As this is stratigraphically the highest occurring specimen of the genus, Jinnah and Rubidge have started preparing a manuscript on the biostratigraphic implications of this find.
- 2.7.6 Amphibian fossils. The following projects are currently in progress:
- 1) Ms Elizabeth Latimer is still writing up her PhD on Permian amphibians from the Beaufort Group on a part time basis under the supervision of Prof Rubidge.
  - 2) Together with Dr R Schoch from Germany the following paper has been published. Schoch R.R. & Rubidge B.S. The amphibaemid *Micropholis stowi* from the *Lystrosaurus* Assemblage Zone of South Africa.
- 2.7.7 Postcranial anatomy of therocephalian therapsids. This project is an extension of the PhD project of Heidi Fourie (Transvaal Museum) who completed her thesis under the supervision of Professor Rubidge. Heidi Fourie and Bruce Rubidge have written a draft manuscript on the postcranium of *Ictidorhinus*. This manuscript was modified considerably during 2005, but still require modification.
- 2.7.8 The bio- and lithostratigraphy of the Permo-Triassic boundary in the northern part of the Karoo Basin. Anthony Rutherford is in the final stages of completing his MSc on the bio- and lithostratigraphy of the middle Beaufort in the Thaba Nchu area. He has been doing this

on a part-time basis since 2004 under the joint supervision of Dr John Hancox and Prof Bruce Rubidge.

2.7.10 Database of Karoo fossil localities: For her PhD thesis Ms Merrill Nicolas has embarked on the very large task of compiling a GIS database of all fossils housed in South African Institutions with data on their localities. This project, under the supervision of Prof Bruce Rubidge, will have important implications for understanding and enhancing biogeography, biodiversity and biostratigraphy of continental faunas of the Permian and Triassic periods. Progress was delayed in that Ms Nicolas had considerable problems in streamlining the computer database during 2005. These problems have been overcome and Ms Nicolas plans to submit her PhD early in 2006.

## 2.8 Dr A Yates

2.8.1. The origin and early evolution of the dinosaurian titans: New evidence of early sauropod history from South Africa. This National Geographic Funded Project was initiated during 2004 in collaboration with Drs Matt Bonnan (University of Western Illinois), Johann Neveling (Council for Geoscience) and John Hancox. One week of fieldwork was undertaken to Heebo Farms in the Rozendal district in April to continue with excavation of a new species of sauropod dinosaur was discovered previously

2.8.2 Description of the cranial morphology of *Melanorosaurus*. The only one skull of this dinosaur is known from the Triassic of South Africa. Dr Yates has continued his description of the specimen and a paper will be submitted in 2006.

2.8.3 During November Dr Yates spent five days in the field exploring potential dinosaur nesting sites in Golden Gate and Ladybrand districts with Prof. Robert Reisz from the University of Toronto. This is part of a long project to study early dinosaur nesting behaviour.

2.8.4 Dr Yates undertook a study trip to China funded by PAST. Early sauropodomorph dinosaurs were studied in the IVPP, Beijing; Kunming Municipal Museum, Kunming; Lufeng Dinosaur Museum, Lufeng; Chuxiong Museum, Chuxiong. During this trip a plan for collaboration between himself and Dr. Lü Junchang, Institute of Geology, Chinese Academy of Geological Sciences, Beijing, was worked out. Several papers on the taxonomy of dinosaurs from Yunnan are now in preparation as a result of this collaboration.

## 3. PUBLICATIONS

### **3.1. Published articles**

#### **CATEGORY 1 - BOOKS**

##### **Submission type: Books**

D'Errico, F. and **Backwell**, L. (Eds) 2005. From Tools to Symbols. From Early Hominids to Modern Humans. Witwatersrand University Press, Johannesburg.

ISBN: 1-86814-4178.

McCarthy, T.S. and **Rubidge**, B.S., 2005. The Story of Earth and Life. A southern African perspective on a 4.6-billion-year journey. Struik Publishers, Cape Town.

Contributing authors include: **Backwell**, L., **Bamford**, M.K., **Berger**, L.R., **Raath**, M.A.

**\*\*Berger**, L.R. and Smilg, J.S. (2005) the Handling of Medical Emergencies in the Cradle of Humankind. *Prime Origins Publishing* and *The National Lottery*. Cape Town. ISBN 0-620-34248-x

**\*\*Berger**, L.R. (2005) Working and Guiding in the Cradle of Humankind. *Prime Origins Publishing* and *The National Lottery*. Cape Town. ISBN 0-620-31866-x

**\*\*Hilton-Barber**, B. and **Berger**, L.R. (2004) Field Guide to the Cradle of Humankind (**2<sup>nd</sup> edition**). *Struik*, Cape Town ISBN

**LEE – To get any credit the Research Office must have the copies and supporting documentation – all of which I have given to you to fill in and get reviews. PLEASE return BEFORE 30 Jan.**

### **Category 2 – Chapters in books.**

Galton, P.M., van Heerden, J and **Yates**, A.M. 2005. Postcranial anatomy of referred specimens of the sauropodomorph dinosaur *Melanorosaurus* from the Upper Triassic of South Africa. In: Tidwell, V. and Carpenter, K. (Eds.) *Thunder-Lizards*. Indiana University Press, Bloomington, pp. 1-37.

**Yates**, A.M. 2005. Dinosaurs. In: Selly, R.C., Cocks, L.R.M. and Plimes, I.R. (Eds). *Encyclopaedia of Geology*. Academic Press, London. Pp. 490-496.

### **Category 3 – Published conference Proceedings**

**Backwell**, L. and d’Errico, F. 2005. The origin of bone tool Technology and the identification of early hominid cultural traditions. In: D’Errico, F. and Backwell, L. (Eds) 2005. *From Tools to Symbols. From Early Hominids to Modern Humans*. Witwatersrand University Press, Johannesburg. pp. 238-275.

**Bamford**, M.K. 2005. Environmental changes and hominid evolution: what the vegetation tells us. In: D’Errico, F. and Backwell, L. (Eds) 2005. *From Tools to Symbols. From Early Hominids to Modern Humans*. Witwatersrand University Press, Johannesburg. pp. 103-120.

**Berger**, L. 2005. The impact of new excavations from the Cradle of Humankind on our understanding of the evolution of hominins and their cultures. In: D’Errico, F. and Backwell, L. (Eds) 2005. *From Tools to Symbols. From Early Hominids to Modern Humans*.

Witwatersrand University Press, Johannesburg. pp. 152-162.

D'Errico, F. and **Backwell**, L. 2005. Searching for common ground in Palaeoanthropology, Archaeology and Genetics. In: D'Errico, F. and Backwell, L. (Eds) 2005. From Tools to Symbols. From Early Hominids to Modern Humans. Witwatersrand University Press, Johannesburg. pp. 1-8.

#### **Category 4 – Academic Journal Articles (ISI Listed)**

**Abdala**, F., Hancox, P.J. and Neveling, J. 2005. Cynodonts from the uppermost Burgersdorp Formation, South Africa, and their bearing on the biostratigraphy and correlation of the Triassic *Cynognathus* Assemblage Zone. *Journal of Vertebrate Palaeontology* 25: 192-199.

**Bamford**, M.K. 2005. Early Pleistocene fossil wood from Olduvai Gorge, Tanzania. *Quaternary International* 129: 15-22.

Bordy, E.M., Hancox, P.J., **Rubidge**, B.S. 2005. The contact of the Molteno and Elliot Formations through the main Karoo Basin, South Africa: a second order sequence boundary. *South African Journal of Geology*, **108** (3), 351-364.

**Cisneros**, J.C., **Abdala**, F. and Malabarba, M.C. 2005. Pareiasaurids from the Rio do Rasto Formation, southern Brazil: biostratigraphic implications for Permian faunas of the Paraná Basin. *Revista Brasileira de Paleontologia*, 8: 13-24.

Cukrowska, E.M., McCarthy, T.S., Pole, S., **Backwell**, L. and **Steininger**, C. 2005. The chemical removal of manganese dioxide coatings from fossil bones from the Cradle of Humankind, South Africa. *South African Journal of Science*, 101: 101-103.

De Ruiter, D., **Steininger**, C. and **Berger**, L.R. 2005. A composite cranium of *Paranthropus robustus* from the hanging remnant of Swartkrans, South Africa. *American Journal of Physical Anthropology*, ????????????????????

Gastaldo, R.A., **Adendorff**, R., **Bamford**, M., Labandería, C.C., Neveling, J. and Sims, H. 2005. Taphonomic trends of macrofloral assemblages across the Permian-Triassic boundary, Karoo Basin, South Africa. *Palaios* 20: 479-497.

Häuler, M., Isler, K., Schmid, P. and **Berger**, L. 2004. 3D-digital mapping of the early hominid cave site of Gladysvale Cave, South Africa. *Human Evolution* 19(1), 45.

Reisz, R.R., Scott, D., Sues, H-D., Evans, D.C. and **Raath**, M.A. 2005. Embryos of an Early Jurassic prosauropod dinosaur and their evolutionary significance. *Science*, 309, 761-764.  
ISSN: 0036-8075

**Rubidge**, B.S. 2005. Re-uniting lost continents – Fossil reptiles from the ancient Karoo and their wanderlust. *South African Journal of Geology*, **108** (3), 135-172.

Sues, H-D, Reisz, R.R., Hinic, S. and **Raath, M.A.** 2004. On the skull of *Massospondylus carinatus* Owen 1954 (Dinosauria: Sauropodomorpha) from the Elliot and Clarens formations (Lower Jurassic) of South Africa. *Annals of Carnegie Museum* **73**(4): 239-257.

Schoch, R.R. and **Rubidge B.S.** 2005. The amphibamid *Micropholis stowi* from the *Lystrosaurus* Assemblage Zone of South Africa. *Journal of Vertebrate Paleontology*, **25**, 502-522.

Sidor, C.A., O'Keefe, F.R., **Damiani, R.**, Steyer, S.J., Smith, R.M.H., Larsson, H.C.E., Sereno, P.C., Ide, O., and Maga, A. 2005. Permian tetrapods from the Sahara show climate-controlled endemism in Pangea. *Nature* 434, 886-889.

Steyer, J.S. and **Damiani, R.** 2005. A giant brachyopoid temnospondyl from the Upper Triassic or Lower Jurassic of Lesotho. *Bullétin de la Société géologique de France* 176 (3), 243-248.

**Yates, A.M.**, Hancox, P.J. and **Rubidge, B.S.** 2004. First record of a sauropod dinosaur from the upper Elliot Formation (Early Jurassic) of South Africa. *South African Journal of Science* 100: 504-506.

**Yates, A.M.** and **Vasconcelos, C.** 2005. Furcula-like clavicles in the prosauropod dinosaur *Massospondylus*. *Journal of Vertebrate Paleontology*, 25: 466-468.

#### **Category 4A – non-accredited Journal Articles**

**Backwell, L.** and d'Errico, F. 2004. Reassessing early hominid bone tool traditions through experimentation and microscopic analysis. *Microscopy Society of southern Africa, Proceedings*. 34: 91.

**Backwell, L.** and d'Errico, F. 2005. The earliest use of elephant bone. A Reappraisal of the Olduvai Evidence. In: Agenbroad, L.D. and Symington, R.L. (Eds). 2<sup>nd</sup> World of Elephants Elephants Congress. Short Papers and Abstracts. Mammoth Site of Hot Springs, South Dakota, USA 13-15 September 2005. pp. 13-15.

**Bamford, M.K.** and Grab, S. 2005. Highlights of Quaternary research in Southern Africa, and proceeding forward. Editorial. *Quaternary International* 129, 1-3.

Bordy, E.M., Hancox, P.J., **Rubidge, B.S.** 2005. Turner, B.R and Thomson, K. Discussion on 'Basin development during deposition of the Elliot Foramation (Late Triassic – Early Jurassic), Karoo Supergroup, Soouth Africa' (South African Journal of Geology, 107, 397-412) – reply. *South African Journal of Geology*, **108** (3), 454-461.  
ISSN: 1012-0750

**Lacruz, R.** and Maude, G. 2005. Bone accumulations at brown hyena (*Parahyaena brunnea*) den sites in the Makadikgadi Pans, northern Botswana: behavioral and palaeoecological implications. *Journal of Taphonomy* 3: 43-53.

**Rubidge, B.S.** 2005. Middle-Late Permian tetrapod faunas from the South African Karoo and their biogeographic significance. *New Mexico Museum of Natural History and Science Bulletin*, **30**, 292-294.

**Rubidge, B.S.** 2005. The Karoo – a fossil Mecca. *Quest* 2(1), 16 – 21

## **Category 5**

### **Submission Type: Conference abstracts**

**Bamford, M.K.**, Andrews, P. and Harrison, T. 2005. Reconstruction of the Pliocene vegetation at Laetoli, Tanzania, based on fossil woods and modern vegetation analysis. (Abstract volume p. 12.) Pan African Archaeological Association for Prehistory and Related Studies, 12th Congress, University of Botswana, Gaborone, 3-10 July 2005.

Van der Merwe, N.J. and **Bamford, M.K.** What could early hominins eat in a wetland? (Abstract volume p. 28). Pan African Archaeological Association for Prehistory and Related Studies, 12th Congress, University of Botswana, Gaborone, 3-10 July 2005.

Blumenschine, R.J., Peters, C.R., Masao, F.T., Hay, R.L., Stanistreet, I.G., Stollhofen, H., **Bamford, M.K.**, Albert, R.M., Andrews, P.J., Ebert, J.I., and Njau, J. 2005. Traces of Oldowan Hominid Land Use during the Lowermost Bed II landscape succession in the palaeo-Olduvai Basin, Tanzania. (Abstract volume p. 13-14). Pan African Archaeological Association for Prehistory and Related Studies, 12th Congress, University of Botswana, Gaborone, 3-10 July 2005.

**Yates, A. M.** 2005. The skull of the Triassic sauropodomorph, *Melanorosaurus readi*, from South Africa and the definition of Sauropoda. *Journal of Vertebrate Paleontology* 25 (supplement to no. 3): 132A

## **CATEGORY 8:**

### **Submission type: Editorships Other**

**Bamford, MK, Raath, MA & Rubidge, BS.**  
*Palaeontologia africana* **41**.

**Rubidge, BS**

Editorial Board of *Annals of the South African Museum*.

**Rubidge, BS**

Editorial Board of *Researches of the National Museum*.

**Bamford, M.K.** and Grab, S.W. 2005. Guest Editors, *Quaternary International*. Volume 129. Highlights of Quaternary Research in southern Africa and proceeding forwards,

**Published Abstracts:** (not submitted to Research Office)

Pole, S., Cukrowska, E., McCarthy, T.S., **Backwell**, L. and **Steininger**, C. 2005. The chemical removal of manganese dioxide coatings from fossil bone. Abstract: V International Bone Diagenesis Meeting, University of Cape Town. P. 36.  
<http://www.uct-cmc.co.za/conferences/2005/bonediag/info.html>

**Yates**, A. 2005. The skull of the Triassic sauropodomorph, *Melanorosaurus readi*, from South Africa and the definition of Sauropoda. Abstracts of Papers. 65<sup>th</sup> Annual Meeting of the SVP, Arizona. *Journal of Vertebrate Paleontology*, 25, suppl to No. 3. p.  
Adam - need page no

**Technical Reports/other**

Berger, L.R. and Hilton Barber, B. (2004) An Explorer's Guide to the Cradle of Humankind World Heritage Site – South Africa. *Map Studio*. ISBN 1-86809-743-9

Berger, L.R. and Hilton-Barber, B. (2005) Kruger Park Animal Map. *Prime Origins*.

Hilton-Barber, B. and Berger, L.R. (2005) Kruger Park Birding Map. *Prime Origins*.

**3.2 Papers and books in press**

**\* Articles which have appeared in print subsequent to submission of articles to Wits Publications**

**CATEGORY 1**

**Submission type: Books**

**CATEGORY 2:**

**Submission type: Chapters in books**

Hilton-Barber, B. and Berger, L.R. A Concise Guide to the Cradle of Humankind. *Struik*

Galton, P. M., J. van Heerden, J. & A. M. Yates. (in press). The postcranial anatomy of referred specimens of the sauropodomorph dinosaur *Melanorosaurus* from the Upper Triassic of South Africa. In Tidwell, V. & Carpenter, K. (Eds.) *Thunder-lizards: the Sauropodomorph Dinosaurs*. Bloomington: Indiana University Press.

\*Yates, A. M. 2005. *Vertebrate Palaeontology: Dinosaurs*. In *Encyclopedia of Geology* (R. C. Selley, L. R. M. Cocks, I. R. Plimer, eds) Elsevier: Oxford. Vol.2, pp. 490-496 (is this still in press)

#### CATEGORY 4:

##### Submission type: Academic Journal articles DE Submissible

**F. Abdala** and M. Allinson. The taxonomic status of *Parathrinaxodon proops* and the morphology of the palate in Late Permian non-mammaliaform cynodonts. *Palaeontologia africana*.

**F. Abdala**, J. Neveling and J. Wellman. A new trirachodontid cynodont from the lower levels of the Burgersdorp Formation (Lower Triassic) of the Beaufort Group, South Africa and the cladistic relationships of Gondwanan gomphodonts. *Zoological Journal of the Linnean Society*.

Albert, R.M., **Bamford, M.K.** and Cabanes, D. (in press). Taphonomy of phytoliths and macroplants in different soils from Olduvai Gorge, Tanzania: application to Plio-Pleistocene palaeoanthropological samples. *Quaternary International*.

Angielczyk, K.D. and **Rubidge, B.S.** A new robertiid dicynodont (Therapsida, Anomodontia) from the Upper Permian of South Africa and its significance for the biostratigraphy of the Karoo Basin. *Paleontology*

Barale, G., **Bamford, M.K.**, Gomez, B., Broderick, T.J., Raath, M.A. and Cadman, A. (in press). A fossil peat deposit from the Late Triassic (Carnian) of Zimbabwe with preserved cuticles of Pteridospermopsida and Ginkgoales, and its geological setting. *Palaeontologia africana* 41.

Barrett, P. M. and **A. M. Yates**. in press. New information on the palate and lower jaw of *Massospondylus* (Dinosauria: Sauropodomorpha). *Palaeontologia africana*.

**Bamford, M.K.**, Albert, R.M. and Cabanes, D. (in press). Plio-Pleistocene macroplant fossil remains and phytoliths from Lowermost Bed II in the eastern palaeolake margin of Olduvai Gorge, Tanzania. *Quaternary International*. (18p)

**Bamford, M.K.**, Peters, C.R., Stanistreet, I.R., Stollhofen, H. & Albert, R.M. (submitted Sept. 2005). Late Pliocene grassland from Olduvai Gorge, Tanzania. *Palaeogeography, Palaeoclimatology, Palaeoecology*.

**Berger, L.R.** (in press) Predatory Bird Damage to the Taung Type-Skull of *Australopithecus africanus* Dart 1925. *Am. J. Phys. Anthropol.*

**Berger, L.R.** (in press) Comments on Dobson (2005), body proportions in early hominins and the joint and limb proportion differences between Stw 431 (*A. africanus*) and A.L. 288-1 (*A. afarensis*). *J. Hum. Evol.*

**Damiani, R.**, Sidor, C.A., Steyer, J.S., Smith, R.M.H., Larsson, H.C.E., Maga, A. & Ide, O. The vertebrate fauna of the Upper Permian of Niger. IV. The primitive temnospondyl *Saharastega moradiensis*. *Journal of Vertebrate Paleontology*, MS 46 pp, 5 figs.



d'Errico, F. & **Backwell, L.R.** 2005. From Swartkrans to Arcy-sur-Cure. The use of bone tools in the Lower and Middle Palaeolithic. In E. Baquedano (Ed.), *El Universo Neanderthal*. Spain. (In press).

d'Errico, F. & **Backwell, L.R.** 2005. Bone tool technology and the emergence of modern cognition. Book chapter. *McDonald Institute for Archaeological Research*, University of Cambridge. (In press).

deRuiter, D., **Steininger, C.** and **Berger, L.R.** (in press) A composite cranium of *Paranthropus robustus* from the hanging remnant of Swartkrans, South Africa. *Am. J. Phys. Anthrop.*

Flores, D.A., Giannini, N. P. and **Abdala, F.** Comparative postnatal ontogeny of the skull in an australidelphian metatherian, *Dasyurus albopunctatus* (Marsupialia: Dasyuromorpha: Dasyuridae). *Journal of Morphology*.

Hartstone-Rose, A. **Berger, L.R.** (in press) A saber-tooth cat (*Megantereon cultridens*) from the Coopers site, South Africa. *Vertebrate Paleontology*.

Hall, G., **Berger, L.R.** and Schmid, P. (in press) A new handaxe locality at the Gladysvale site, South Africa. *S. African Journal of Science*.

Pole, S., Cukrowska, E., McCarthy, T.S., **Backwell, L.** and Steininger, C. 2005. The chemical removal of manganese dioxide coatings from fossil bones. *South African Journal of Science*. **101**: 1-3.

**Raath, M.** and **Yates, A. M.** Preliminary report of a large theropod dinosaur trackway in Clarens Formation sandstone in the Paul Roux district, northeastern Free State, South Africa. *Palaeontologia africana*

**Rubidge, B.S.**, Sidor, C.A. and **Modesto, S.P.** A new burnetiamorph (therapsida: Biarmosuchia) from the middle Permian of South Africa. *Journal of Paleontology*.

Sidor C.A. and **Rubidge B.S.** *Quaggasaurus hopsoni*, a new biarmosuchian (Therapsida: Biarmosuchia) from the lower Beaufort Group of South Africa.

Smith R.M.H., **Rubidge B.S.** and Sidor, C.A. *Paraburnetia* (Therapsida: Biarmosuchia) from the Late Permian of South Africa: implications for trans-Pangaeian therapsid migration.

Yates, A.M. A new carnivorous dinosaur from the Early Jurassic of South Africa with a mosaic of coelophysoid and derived theropod characteristics. *Palaeontologia africana*.

## **CATEGORY 5:**

**Submission type: Academic Journal articles, Other**

Steininger, C., Hardy, Y. and Backwell, L.R. 2005. *Walking Tall. The Story of Human Evolution*. An Educator Booklet for Senior Learners. Published by the Palaeontology Scientific Trust (PAST).

#### 4. CONFERENCES

Staff and students of the BPI Palaeontology participated in the following conferences.

##### **Abdala, F.**

August 2005: Congresso Brasileiro de Paleontologia/ VI Congresso Latino-Americano de Paleontología. 14-19 de agosto 2005, Aracaju. Papers presented:

Malabarba, M.C., Weiss, F.E. and **Abdala F.** 2005. Ultrastructural analysis on dental enamel of traversodontids (Synapsida, Eucynodontia) from the Triassic of Rio Grande do Sul. XIX Weiss, F.E., Malabarba, M.C., **Abdala, F.** 2005. Dental enamel microstructure in traversodontids (Synapsida, Eucynodontia): 1. *Santacruzodon hopsoni*. II Congresso Latinoamericano de Paleontologia de Vertebrados, 10-12 agosto, 2005. Rio de Janeiro. Boletim de Resumos, editores: Kellner, A.; D. Henriques & T. Rodrigues, p. 272-273.

October 2005: Gondwana 12, Argentina. Papers presented:

**Abdala, F.**, Neveling, J. and **Rubidge, B.S.** 2005. *A new cynodont from the base of the Cynognathus Assemblage Zone (Lower Triassic) of the Karoo Basin: wrong teeth or wrong skull?* In: Pankhurst, R.J. and Veiga, G.D. (eds.) Gondwana 12: Geological and biological heritage of Gondwana, Abstracts, Academia Nacional de Ciencias, Cordoba, Argentina, p. 31.

Malabarba, M.C., **Abdala F.** and Weiss, F.E. 2005. A new record of a traversodontid cynodont from the Santa Maria Formation (Middle-Upper Triassic), southern Brazil, and a comparison of the enamel pattern among Brazilian and Argentinean traversodontids. In: Pankhurst, R.J. and Veiga, G.D. (eds.) Gondwana 12: Geological and biological heritage of Gondwana, Abstracts, Academia Nacional de Ciencias, Cordoba, Argentina, p. 236.

##### **Backwell, L.R.**

September 2005: “*The World of Elephants*”, 2<sup>nd</sup> International Congress, Hot Springs, South Dakota, USA.. Paper presented: **Backwell, L.R.** & d’Errico, F. 2005. *The earliest use of elephant bone. A reappraisal of the Olduvai evidence.*

August 2005: *Fifth International Bone Diagenesis Conference*, University of Cape Town. Paper presented: Pole, S., Cukrowska, E., McCarthy, T.S., **Backwell, L.** & **Steininger, C.** 2005. *The chemical removal of manganese dioxide coatings from fossil bones from the Cradle of Humankind.*

##### **Bamford MK:**

July 2005: Pan African Archaeological Association for Prehistory and Related Studies, 12th Congress, University of Botswana, Gaborone.

Papers presented: (presenter underlined)

Bamford, M.K., Andrews, P. and Harrison, T. *Reconstruction of the Pliocene vegetation at Laetoli, Tanzania, based on fossil woods and modern vegetation analysis*. (Abstract volume p. 12.)

Van der Merwe, N.J. and Bamford, M.K. *What could early hominins eat in a wetland?* (Abstract volume p. 28).

Blumenschine, R.J., Peters, C.R., Masao, F.T., Hay, R.L., Stanistreet, I.G., Stollhofen, H., Bamford, M.k., Albert, R.M., Andrews, P.J., Ebert, J.I., and Njau, J. *Traces of Oldowan Hominid Land Use during the Lowermost Bed II landscape succession in the palaeo-Olduvai Basin, Tanzania*. (Abstract volume p. 13-14).

May 2005: 3rd International Workshop on the Olduvai Landscape Palaeoanthropology Project, ICREA, and University of Barcelona, Barcelona, Spain, 3-6 May 2005.

Paper presented: Bamford, M.K. *Fossil plants from Olduvai Gorge: status quo and future research*.

### **Berger LR:**

April 2005 – World Presidents Organization – Cape Town – Paper presented: *Out of Africa*.

June 2005: Young Presidents Organization – Johannesburg, - Paper presented: *The African origins of Humanity*.

July 2005: 12<sup>th</sup> Congress of the Panafrican Archaeological Association for Prehistory and Related Studies. Gaborone, Botswana. Anne R. Skinner, Steven Churchill & Lee R Berger, *Dating at Plovers Lake by electron spin resonance...*

### **Cisneros, J.C.**

### **Lacruz, R.**

### **Rubidge BS**

October 2005: Participation in International Nonmarine Permian Symposium, Albuquerque, New Mexico, USA. Keynote paper: Rubidge, B.S. *Middle-Late Permian tetrapod fauna from the South African Karoo and its biogeographic significance*.

July 2005: Participation in 5<sup>th</sup> International Conference of Animal Health Information Specialists, University of Pretoria, Onderstepoort, South Africa, Invited paper: Rubidge, B.S. *Catalogue to our past and clues for the future – What the fossil record tells us*.

February 2005: Participation in Fossils X3; Pretoria, South Africa (3<sup>rd</sup> International Congress of Palaeoentomology with 2<sup>nd</sup> International Meeting on Palaeoarthropodology and 2<sup>nd</sup> World Congress on Amber and its inclusions) Invited paper: Rubidge, B.S. *Palaeontology in South Africa*.

### **Yates, AM**

October 2004: 65<sup>th</sup> Annual meeting of Society of Vertebrate Paleontology, Mesa, Arizona  
Paper: Yates, A. *The skull of the Triassic sauropodomorph, Melanorosaurus readi, from South Africa and the definition of Sauropoda.*

## 5. VISITS TO OTHER INSTITUTIONS

The staff of the Institute have visited various institutes for the purpose of collaboration and/or loan of material:

### **Dr F Abdala visited**

Iziko South African Museum, Cape Town.  
Stellenbosch University, Stellenbosch.  
Geological Survey of Namibia  
National Museum, Bloemfontein.  
Rubidge collection, Wellwood, Graff Reinet.  
Museo de Ciencias Naturales y Antropológicas, Juan Cornelio Moyano, Mendoza, Argentina.  
Museo de Paleontología de la Universidad Nacional de San Juan, Argentina.  
Colección Paleontología de Vertebrados Lillo, Universidad Nacional de Tucuman, Argentina.

### **Dr Lucinda Backwell**

Denver Museum of Nature and Science, Colorado, USA.  
Mammoth site, Hot Springs, South Dakota, USA.  
University of Bordeaux, France.  
Transvaal Museum, Pretoria.

### **Dr Marion Bamford**

National Museum, Nairobi, Kenya  
National Museum, Gaborone, Botswana  
University of Botswana, Gaborone  
Harry Oppenheimer Okavango Research Centre, Maun, Gaborone  
Arusha Natural History Museum, Tanzania  
South African Museum, Cape Town  
Albany Museum, Grahamstown  
Botany Department, Rhodes University  
SANBI, Pretoria  
University of Barcelona, Spain

### **Prof. Lee Berger**

South African Museum, Cape Town  
University of Cape Town  
Transvaal Museum, Pretoria  
Georgia Southern University, Georgia  
Natural History Museum, London  
National Geographic Society, Washington D.C.  
La Brea Tarpits, Los Angeles, California

**Dr Mike Raath**

South African Museum (to collect returned loan);  
Albany Museum, to present the Hewitt Memorial lecture on 9 Sept 2005

**Professor Bruce Rubidge**

Albany Museum, Grahamstown.  
South African Museum, Cape Town  
National Museum, Bloemfontein  
Rubidge Collection, Graaff-Reinet  
Transvaal Museum, Pretoria  
Natural History Museum of New Mexico, Albuquerque, USA.

**Dr Adam Yates**

National Museum, Bloemfontein  
Museum of Paleontology, University of California, Berkeley

**6. VISITING SCIENTISTS**

**From South Africa**

Dr Jennifer Botha	Iziko: SA Museum of Cape Town
Dr Billy de Klerk	Albany Museum, Grahamstown
Dr Michiel de Kock	University of Johannesburg
Dr Heidi Fourie	Transvaal Museum, Pretoria
Dr Johann Neveling	Council for Geoscience, Pretoria
Dr Roger Smith	Karoo Palaeontology, IZIKO SA Museum, Cape Town

**From the Americas**

Dr Darryl de Ruiter	Texas A&M University
Dr Robert Gastaldo	Colby College, Dept Geology Waterville ME USA

Prof. Steven Churchill Duke University, North Carolina  
Dr Conrad Labandeira Palaeobiology Dept, National Museum of Natural History, Smithsonian  
Dr Sean Modesto University Colelge of Cape Breton, Canada  
Dr Charles Peters Anthrogeology & Ecology, University of Georgia, USA  
Dr Robert Reisz University of Torronto, Canada  
Dr Christian Sidor NYCOM, New York, USA  
Dr Hallie Sims Dept Palaeobiology NMNH Smithsonian.

## From Australia

## From Europe

Dr Bernard Battail	Museum National d'Histoire Naturelle, Paris, France
Dr Francesco d'Errico	institut de Prehistoire, Univ. Bourdeau, France
Dr. Peter Schmid	University of Zurich, Switzerland
Dr Andfer Ivanstol	Paleontological Institute, Moscow Russia
Dr Herve Sauquet	Sweedish Museum of Natural History, Stockholm

## From ASIA

Dr Somsak Pramankij	Mahidol University, Thailand
Dr Vadhana Subhaven	Mahidol University, Thailand

## 7. LECTURING AND STUDENTS

### 7.1 Postgraduate Students

#### PhD Students

ADENDORFF, R. “*The habitat, variation and biostratigraphic correlation of Glossopteris in South Africa*”. Graduated 2005.

Supervisor: M.K. Bamford

CISNEROS, J. “*The Triassic parareptile procolophon: Cranial anatomy, variation, biostratigraphy and biogeographic distribution*”

Supervisors: B.S Rubidge, R. Damiani

GESS, R. *A taxonomic, biogeographic, biostratigraphic and palaeoecological synthesis of the Famennian Witpoort Formation of South Africa (Cape Supergroup, Witteberg Group)*

Supervisors: B.S. Rubidge, M. Coates, P. Gensel.

GOVENDER, R. “*Morphological and physiological analysis of the postcranial anatomy of the*

Triassic dicynodont *Kannemeyeria* (Therapsida: Dicynodontia).  
Supervisors: P.J. Hancox, A. Yates.

LACRUZ, R.S. “*The analysis of growth markings in enamel tissue of Plio-Pleistocene hominids of Africa*”.  
Supervisor: L.R. Berger, F Rossi, T Bromage.

NICOLAS, M. “*An assessment of vertebrate biodiversity changes through the Permo-Triassic Beaufort Group (Karoo Supergroup) of South Africa and its significance in terms of biological basin development, hiatus periods and extinction events.*”  
Supervisor: B.S. Rubidge

POLE, S. ‘*Development and validation of non-invasive chemical methods for cleaning of palaeontological specimens*’.  
Supervisors: E. Cukrowska, L Backwell.

SANDERSEN, A. “*A later Cretaceous biostratigraphy based on palynomorphs derived from southern African sediments*”.  
Supervisor: P.J. Hancox, L. Scott.

STEININGER, C. “*The emergence of early Homo and the extinction of paranthropus robustus: environmental and faunal change in the Blaauwbankspruit of South Africa*”. Supervisor: L. Berger, N van der Merwe, P Unger..

ZIPFEL, B. “*An investigation into the morphological and pathological variation of the first metatarsal ray in the genus Homo during the Pleistocene and Holocene*”. Graduated 2005.  
Supervisor: L.R. Berger, R Kidd

#### MSc Students

BOSHOFF, P. “*Fossil coprolites in the Plio-Pleistocene aged cave deposits of South Africa*”  
Supervisor: L.R. Berger

FRANKLIN, R. “*The recognition, frequency and taxonomic association of pathologies from the Plio-Pleistocene Aged sites of Coopers D, Witwatersrand, South Africa*”  
Supervisors: L.R. Berger, L Backwell

MASON, R. “*A stratigraphic and biostratigraphic synthesis of the Ecca-Beaufort contact in the Eastern Cape Province, South Africa*”.  
Supervisors: BS Rubidge, PJ Hancox.

PICKERING, R. “*The chronostratigraphy of a Pleistocene cave fill, Gladysvale Cave (South Africa): a key to understanding climatically controlled cyclic cave fills*”. Graduated 2005.  
Supervisors: L.R Berger, PJ Hancox

RENAUT, R. “*The morphology and physiology of the Permian sphenophytes of South Africa and the implications to taxonomy and biostratigraphy*”.  
Supervisor: M.K. Bamford.



RUTHERFORD, A.B. “A multi-disciplinary sedimentological, stratigraphic and palaeoenvironmental appraisal of the Permian and Triassic Karoo strata in the vicinity of Thaba Nchu, in the Free State.”

Supervisors: P.J. Hancox, B.S. Rubidge.

VASCONCELOS, C. “Proposal of a neotype for *Massospondylus carinatus* Owen (Dinosauria, Sauropodomorpha): the postcranial morphology and implications for prosauropod phylogeny”

Supervisors: M.A. Raath, A. Yates

Zondo, H. 0114710V (first registered Feb 2003; full time) “A morphological and taxonomic analysis of the South African fossil Hyracoidea including the relative abundance of Hyracoidea and correlations of South African hominid localities in the Sterkfontein Valley, South Africa”

Supervisors: Dr L.R Berger, Dr D de Ruiter

### BSc Honours students

The following students successfully completed their BSc Honours degrees during 2005

Jubair Jinnah **student no**

**Nonhlandla Vilakazi**

**Teboga Mothupi**

### Undergraduate students

As in the past, the Palaeontology Department has been involved in teaching undergraduate courses in the schools of Geosciences, APES (Animal, Plant and Environmental Sciences) and GAES (Geography, Archaeology and Environmental Sciences):

<b>COURSE</b>	<b>STUDENTS</b>	<b>LECTURERS</b>
College: Geol 123	<b>34</b>	B S Rubidge, L.Backwell
Geology 1: Geol 104	<b>111</b>	B S Rubidge, L.Backwell
Geology III: Geol 302	<b>61</b>	B S Rubidge, M Bamford
Anthropology 1	<b>300</b>	L. Backwell
Palaeontology & Palaeoecology APES 301T	46	M.Bamford, L.Backwell, A. Yates
Form & Function (APES II)	<b>17</b>	A. Yates

## 8. OUTREACH PROGRAMME

Apart from the normal research and teaching activities, the BPI has also been active in several public awareness and outreach programmes which are run by **Ian Mc Kay**. To mark the 60<sup>th</sup> anniversary of the BPI Palaeontology a day long programme entitled “*The Story of Life – A new perspective on South Africa’s 3.5 billion year fossil record*” was organised by **Bruce Rubidge** and **Terence (Spike) Mc Carthy**. This programme, which was widely acclaimed by the more than 1000 members of the public who attended, comprised a series of 15 minute

lectures on the origin and development of life. Our thanks to all the palaeontologists from around South Africa who participated in the programme and made it possible (Table 1). The evening before this series of lectures the book “*The story of Earth and Life – a southern African perspective on a 4.6-billion year journey*” edited by Terence Mc Carthy and Bruce Rubidge was launched in Johannesburg.. Within two months of the launch the entire print run was sold, and it has now been reprinted.

**Table 1: The Story of life – a new perspective on South Africa’s 3.5 billion year fossil record.**

Speaker	Title
1. Maarten de Wit	Clues to the origin of life in the Barberton Greenstone Belt
2. Nic Beukes	Life in the Proterozoic and its effect on the Earth’s atmosphere
3. John Hancox	Gondwana – Last of the supercontinents
4. John Almond	Complex organisms colonise a new southern supercontinent
5. Marion Bamford	Floral radiations
6. Bruce Rubidge	Life before dinosaurs
7. Roger Smith	Mother of all extinctions – Resetting the evolutionary clock
8. Adam Yates	Dinosaurs dominate
9. Mike Raath	The world’s oldest dinosaur eggs and embryos
10. Anusuya Chinsamy-Turan	Dinosaurs` way of life- What the bones tell us
11. Billy de Klerk	Cretaceous landscapes
12. Uwe Reimold	Impact catastrophes and mass extinction
13. James Brink	Plio–Pleistocene faunal radiations
14. Lee Berger	Hominid origins and radiations
15. Himla Soodyall	Human origins - genetic clues
16. Lyn Wadley	Human technological development
17. Ben Smith	The origins of art and religion
18. Terence McCarthy	Lessons from the past

### **Setting up the Kitching Fossil Exploration Centre at Nieu Bethesda**

One of the major projects that the BPI initiated in 2005 with funding from the DST and a private donor, was setting up the Kitching Fossil Exploration Centre (KFEC) down in Nieu Bethesda. This was done as a partnership between the BPI Palaeontology, the Albany Museum, and the Owl House Foundation. Setting up the KFEC turned out to be a far more involved process than any of us ever anticipated. First, we had to renovate an old building next door to the Owl House. Next we had to fill the space with exhibits and reconstructions, mainly adapted from existing displays in the Albany Museum, BPI and the South African Museum. Then we had to advertise, interview and appoint guides. Setting up the exhibits in Nieu Bethesdsa had its own special challenges: many of our graphics spontaneously delaminated (aging Billy De Klerk visibly overnight), replacing a missing screw entailed an hour and a half trip to Graaff- Reinet, and frequent power breaks resulted in us having late night group wall plastering and hole drilling sessions- all of which turned out to be great fun and an adventure. The task was also made a great deal easier because of the considerable support which we received from the Nieu Bethesda community.

Together the displays pay tribute to a century of palaeontological endeavour in the area as well as give insight into life at Nieu Bethesda during the late Permian. The displays also covered the End-Permian Extinction event, which is scripted in stone not far away in the Loodsburg Pass. A special feature of the KFEC is that after visitors have studied casts and reconstructions in the Centre itself they can experience the thrill of finding real fossils in the Gats River Bed only 100's of meters away under the supervision of trained guides. All in all we hope that the KFEC will inform and entertain visitors for more than an hour extending their knowledge for the history of the area from decades to hundreds of millions of years. .

Renovating a building and setting up displays was only part of the story. We also trained five guides from the local community to guide tourists around the centre and the Gats River fossil trail. For the guides this meant intensive on site training and also visiting BPI for two weeks for more advanced palaeontological training. This was an eye opening experience as this was their first visit to Johannesburg. Lastly, KFEC needs to be managed and for that a Section 21 company was set up under the direction of Bruce Rubidge.

KFEC was opened on 27 November and thus far has been visited by over 500 visitors, whose response, as recorded in the visitors book, has been very good. So if you know of somebody who is visiting Nieu Bethesda, please have them pop-in and tour the KFEC.

### **Outreach Programme**

2005 was an extremely busy year for our programme. 1500 visitors, mostly school children visited the museums as part of formal organised tours mostly guided by graduate students. In addition, we had to assemble an exhibition for the annual "Yebo Gogo" show organised by the Biologists more formally known as the School of Animal Plant and Environmental Science. This show proved to be a challenge because the theme was the TV show "Survivor"- we had to scratch our heads and puzzle over which fossil plants and animals could be considered "survivors" or "runners up", or even more sadly, "voted out"- a conversation which caused considerable acrimony around the BPI tea table. Next, there was organising school children for the day of talks in the Great Hall in September- Wits invited 100 learners to attend the talks free of charge- which they duly did. Most learners stayed the day, and afterward, said that they really enjoyed the talks even if they were a bit difficult to understand in places. Finally, we also helped set up the KFEC- an event which is reported elsewhere.

### **Launch of the Geosciences Educators Association**

Another exciting event of the year for outreach was the launch of the Geosciences Educators Association, which is actually a division of the Geological Society of South Africa. The division has among its members; school teachers, education department officials, museum curators, researchers, and university lecturers. It aims to use the unique assembly of talents, skills and networks of its members:

- To promote and support geoscience education in South Africa at all levels
- To work for the enhancement of quality in the provision of geoscience education in South Africa/Southern Africa
- To encourage the developments that raise public awareness of geosciences.
- To Bridge the gap between industry and educators at all levels and in all contexts.

In 2005 the GEA organised a “Geoscience Education Symposium” as part of the GSSA Conference in Durban. We also organised an excursion for teachers and education department officials that looked at the Geology of Durban. The GEA would very much like to work with all Geoscientists and societies, including the PSSA, in achieving its aims- so if you are interested in outreach please do join up by contacting Ian McKay at the BPI..

### **Field Guide Training**

On behalf of the South African government and the Field Guides Association of South Africa, Professor Berger undertook the development and implementation of the first field guides specialty course in palaeoanthropology. During 2005 Prof. Berger developed and executed a national training course for field guides in Palaeoanthropology as well as the supporting course materials and trained and certified 18 trainers in Palaeoanthropology. In December of 2005 the course graduated 43 learners as specialist guides in Palaeoanthropology.

## **10. CURATION OF COLLECTIONS**

### **General**

#### **General**

It seems that in recent years each new year brings with it a major disruption to one or other of the collections. This year it was once again the turn of the Cenozoic collections housed in The Wedge building. Because of the fact that the entire roof of the building needed to be replaced as part of the major renovations and alterations related to the rock art Origins Centre development, the entire ground floor of the BPI section of The Wedge had to be cleared. This meant that spaces downstairs in the basement were crammed full of fugitive desks, chairs, showcases, reprint collection box-files and sundry other items. This spilled over into the collections store and the comparative fauna lab as well. As a result, the collections were essentially inaccessible for most of the year. Apart from the difficulty of physical access, there was also the very real danger of falling builders’ debris. By the end of the year the premises were still not accessible, and a big task awaits the curatorial and technical team in the new year to get matters back to normal once the building is handed back.

But, as detailed below, the Karoo Collection was also significantly affected by changes.

The routines for curating the collections on both the Main Campus and the Medical School Campus settled down into smooth working order during this year. It remains rather disruptive having to move backwards and forwards between the two campuses, often at short notice, but this should improve dramatically if and when the collections are eventually united in one place.

### **Karoo Vertebrate Collection**

Having completed the replacement of the old wooden shelving with steel shelving mentioned in the last report, the new year began with a major project to re-shelve all the specimens that had been affected by the change and at the same time to carry out a physical stock-take – the last one having been carried out in 1996/97, shortly after the current Curator took up the curatorship. With the excellent assistance of two Honours students who “owed departmental hours”, Zubair Jinnah

and Bonita de Klerk, all specimens were checked back onto the shelving units and their new storage locations recorded in a working-copy print-out of the catalogue for latest transcription into the computerised database. The relocation project was completed by the end of the 2005 academic year.

### **Fossil Plant and Insect Collection**

Growth on the palaeobotanical side has again mainly been in terms of fossil wood collected by or submitted to Dr Bamford. 395 pieces of wood from the Koobi Fora region of Kenya have been added to the collection, as well as modern plants from South Africa and Botswana.

Rose Adendorff and Conrad Labandeira continued the morpho-typing of the leaves and insect damage from the old and new collections of the *Glossopteris* flora to add to their large database.

### **Cenozoic Fossil Mammals**

Material from several sites in the Cradle of Humankind World Heritage Site continued to enter the collection store at The Wedge as a result of ongoing excavations at those sites, in spite of the disruptions due to the Origins Centre building project.

### **Recent Comparative Osteological Collection**

The status of the other BPI collections remains as reported in the last annual report.

### **Trace Fossil Collection**

The status of the other BPI collections remains as reported in the last annual report.

## **11 PROPOSED RESEARCH PROGRAMME 2006**

### **11.1 Dr F Abdala**

11.1.1 Assessing the palaeobiology of South American cynodonts. This study is based largely on histology of limb bones from the microscopic study of limb bones and will be undertaken in collaboration with Prof Anusuya Chinsamy-Turan (University of Cape Town). Pending of advance in the description of the palaeohistology by Prof. Chinsamy. Completion ?????

11.1.2 Cynodonts from the Omingonde Formation, Namibia. Several cynodonts from the Omingonde Formations are housed in the collections of the Geological Survey in Namibia. These specimens will be described and are important as they provide the link between Anisian east and western faunas from Africa. Two papers are expected to be produced from this project. A first short one will be delivered this year. In relation with this project it is intended to do field trip to the Omingonde Formation to collect additional material with Dr. Roger Smith from the South African Museum. Completion ??????

11.1.3 Postcranial anatomy of basal cynodonts. Several complete skeletons of the cynodonts *Procynosuchus*, *Galesaurus* and *Thrinaxodon* are present in museum collections in

South Africa. As the postcranium of basal cynodonts has not received much attention in recent years, Dr Abdala aims to provide a detailed morphological and functional description of the postcranial anatomy of these genera. Completion ????

- 11.1.4 Alfa-taxonomy of the Therocephalia. This taxon of therapsids forms an important component of the fauna of the Beaufort Group. The taxonomy of this group is in need of revision and Dr Abdala aims to address this. He will start on the Bauriidae. A first draft of a ms about taxonomy of Bauriidae by Abdala, F., van den Heever, J. and Rubidge, B.S. was produced and it is expected the submission to a journal in this year. Completion ????

## 11.2 Dr L. Backwell

- 11.2.1 Early hominid bone tools. Additional resin replicas of experimental comparative collections will be cast and sent to France for analysis using the interferometer in the next month. A paper on our results will be submitted in response to Kuman *et al.* when they publish on the Drimolen purported bone tools. We anticipate that this will be in 2006, but it is the 13<sup>th</sup> year that we await their publication.

A paper on the earliest use of bone tools will be submitted in March for inclusion in the proceedings of the *World of Elephants Congress*.

A paper on early hominid bone tool culture will be presented at the Paleoanthropology Meeting in Puerto Rico in April. The abstract will appear in the *Journal of Human Evolution*.

Two book chapters on early hominid bone tools have been submitted:

d'Errico, F. & Backwell, L.R. 2005. From Swartkrans to Arcy-sur-Cure. The use of bone tools in the Lower and Middle Palaeolithic. In E. Baquedano (Ed.), *El Universo Neanderthal*. Spain.

d'Errico, F. & Backwell, F. 2005. Bone tool technology and the emergence of modern cognition. Book chapter. *McDonald Institute for Archaeological Research*, University of Cambridge.

- 11.2.2 Fossil hair. A large set of scanning electron micrographs of the fossil hairs and comparative modern hairs have been sent to two colleagues in England for study. Additional hairs have been extracted and await inspection in Pretoria using an environmental scanning electron microscope. Verified hairs will be sent to other colleagues in the next few weeks. They will study the fossilisation process, and the morphology by means of microscopic thin sections. When exactly the first publication will be submitted depends upon my collaborators. I've done what I can from my side. Additional breccia blocks containing coprolites will be excavated for ongoing analysis.
- 11.2.3 Cut-marks on fossil human remains. A manuscript has been written and sent to co-authors for comment. Figures will be completed in February. These include scanning electron micrographs and line drawings. Submission is anticipated in March. Fossil bone samples may be sent for DNA analysis.

- 11.2.4 Wonderkrater peat mound. A second field season is planned for June. Excavations will

focus on sampling a long and continuous peat sequence in the centre of the mound for dating, and resumption of activities in the ash deposits, found to contain Middle Stone Age tools on the last day of last year's field season. Isotope results are anticipated soon. Combined pollen, isotope, archaeological, palaeontological and radiocarbon results will be published next year.

- 11.2.5 Heelbo donga site. A second field season of excavations is planned for August. Excavations will be positioned to test whether two channels exist in the deposition of the fauna, and to retrieve additional material for taphonomic analysis. Results will be published 2007.
- 11.2.6 Donga taphonomy and sedimentation. A long-term taphonomic study of a modern eland carcass placed in a donga near the site was started last year. Developments will be documented in August.
- 11.2.7 Termites and early hominid diet. Modern termites found in the Cradle (*Trinervitermes*) will be collected every two months to understand seasonal changes in insect behaviour and morphology linked to reproductive status. A paper will be submitted by the end of the year once results are known. We hypothesise that termites were only viable as a hominid food resource in winter, following the surprising discovery that at present (rainy summer season) mounds are rare, and contain only tiny, undifferentiated termites.
- 11.2.8 Taphonomy of Cooper's D assemblage. Chemical removal of manganese dioxide coatings from fossils is ongoing. The fossil assemblage is large, and cleaned part-time by Steve Pole. Results will be submitted for publication next year.
- 11.2.9 Hillwash and gravitational processes. A long-term experiment is to be set up at a cave site in the Cradle. The aim is to gauge the amount and contents of infill seasonally. I hypothesise that first summer rains are the most significant accumulators of bone due to little vegetation cover. This ties in with a winter termite foraging hypothesis as bone tools are in a good state of preservation, indicating relatively rapid burial. An additional aspect will be documenting surface modifications on strategically positioned modern bones subjected to the natural sedimentary processes.
- 11.2.10 East Africa. Analysis of the Koobi Fora faunal assemblage was planned for later in the year. This followed a Tanzanian researcher proposing that unidentified bone tools exist in the collection. However, following research conducted using the profilometer at the end of last year, we proposed a research project to Tim White concerning reassessment of the three Herto skulls he discovered in Ethiopia. These are the earliest anatomically modern humans, and are thought to bear traces of polishing, interpreted as evidence of curation. White is currently in the field, so has not responded. If he agrees, then we would favour the Ethiopian research over the Koobi Fora project.

### **11.3 Dr M K Bamford**

#### **11.3.1 Karoo Fossil Woods**

I will continue adding to the Karoo wood database to check for any new taxa, refine the

biostratigraphy of the woods and modify as necessary.

#### 11.3.2. Karoo palaeobotany:

The NSF (USA) funded project collaboration with Dr Hallie Sims, Dr Conrad Labandiera, and of the Smithsonian Institution, Washington DC, USA, and Prof Bob Gastaldo of Colby College, Maine, USA, Dr Johann Neveling (Council for Geosciences) and Dr Rose Adendorff (Albany Museum) has almost ground to a halt because of the non-communication of Hallie Sims with any of the members. Nonetheless the rest of the team will continue with the research on the material we have already collected and Dr Labandiera and Prof Gastaldo have applied for more funding. Fieldwork is planned for June 2006. Dr Cindy Looy and Dr Grigor Aitken will publish his thesis.

Completion: ongoing.

#### 11.3.3 Cretaceous and Tertiary Woods

The paper on the Vryburg and **Mahura Muthla** fossil woods will be submitted to the South African Journal of Geology this year when Prof John Ward and Dr Mike de Wit return from the DRC.

Continued research at **Olduvai Gorge**. We have applied for funding from the Wenner-Gren foundation for a small team to continue with fieldwork in July-August 2006. More collecting of macroplants and phytoliths is planned to further the research already published (See Albert et al., in press; Bamford et al., in press).

Completion: Ongoing.

Identification of **West Coast** offshore and onshore woods, in collaboration with De Beers Marine geologists Ian Stevenson, and Lourens Myburgh and Namdeb's Jurgen Jacobs, continues and any interesting finds will be published.

Completion: ongoing.

Drs David Cantrill, Hervé Sauquet and Bamford will collect more material in June and publish on their pollen and macroplant findings later this year for the **Biodiversity** in Southern Africa, SIDA-NRF project.

Completion: end 2007.

Two chapters on the fossil woods (Bamford) and the modern vegetation (Andrews, Bamford, Njau and Leliyo) will be submitted by September 2006 for the monograph on the **Laetoli** (Tanzania) and its palaeoecology to be edited by Prof Terry Harrison.

Completion: mid 2007.

Continue to build up a **modern reference collection** of plant materials (wood, leaves, seeds, pollen) with Prof Charles Peters for comparisons with Tertiary fossil materials as well as study the ecology of modern wetlands (Seekoeivlei, Nylsvley, Okavango Delta, Ol'Balbal Depression, Lakes Makat, Eyasi, Masek and Ndotu. Collaboration with botanists and archaeologists. Project funded by PAST. Completion: Ongoing.

Two palaeoecology papers on the **Koobi Fora** sites are planned for this year and I will



continue with sectioning and identifying the 395 specimens. We will apply to the Wenner Gren Foundation for funding for field work and expand the number of sites. Team: Prof Jack Harris, David Braun, Jack McCoy, Chris Dupre (Rutgers University, New Jersey, USA) and Bamford.

Completion: ongoing.

For the Early Miocene **Rusinga Island** Flora project with funding from the Leakey Foundation, in collaboration with Prof Margaret Collinson (Royal Holloway University, UK) and Prof Peter Andrews, (British Museum of Natural History, London), I will visit the collections in Nairobi in May-June and in London in August.

Completion: early 2007

The identification of the **Ndondondwane** charcoal from the Tugela Valley, KwaZulu Natal, with Prof Haskel Greenfield (University of Manitoba, Winnipeg, Canada) will continue and we plan to submit one of several papers for publication this year.

Completion: ongoing.

A new project comparing the angiosperm floras of **South America** and southern Africa with Dr Alba Zamuner, (University of La Plata, Argentina) and Prof Tania Dutra, (Unisinos, Brazil) using funding from the Wits University Council Overseas Fellowship, will begin with a trip to Argentina in February.

Completion: 1 year funding but ongoing research.

#### **11.4 Prof L R Berger (this requires deadline dates for at least sub-projects)**

11.4.1 Continued research in the taphonomic signatures of birds of prey on bone including the recovery of additional material from the Taung site, South Africa.

11.4.2 Continued collaborative work on fossil hair from hyaena coprolites: Fossil hair has been recovered from 250 000 year old hyaena coprolites from Gladysvale as noted in Dr. Backwell's report above.

11.4.3 Collaborative work on cannibalism with Dr. L. Backwell.

11.4.4 Ongoing field work at the sites of Coopers, Plovers Lake and Gladysvale continuing the recovery of micro- and macro- animal remains and archaeological remains from these important sites.

11.4.5 Specific research into early hominin postcranial morphology with the goal of understanding body proportions and modes and tempos of human evolution in the late Pliocene.

11.4.6 A continued programme of dating the early hominin sites of South Africa utilizing new and independent methods of radiometric dating.

11.4.7 Completion of plans for a fossil expedition to Zimbabwe in 2007.

#### **11.5 Prof B S Rubidge**

- 11.5.1 Litho- and Biostratigraphy of the Lower Beaufort around the basin:  
Eastern Cape – although much bio and lithostratigraphic field work has been undertaken to the Lower Beaufort in recent years more collecting is needed in order to understand the Biostratigraphy of the lower Beaufort in the area between Grahamstown and Jansenville. Completion: 2006 for area north of Grahamstown, otherwise ongoing.
- KwaZulu-Natal – Fieldwork has been completed, but a cast of the footprint site must be made from the mould taken in 2005. This is the responsibility of de Klerk. The final manuscript needs to be put together. Completion: December 2006.
- 11.5.2 Description of the postcranial skeleton of *Tapinocaninus*, a new primitive tapinocephaline dinocephalian. A draft manuscript in collaboration with Govender, and Renault has been written up for the vertebral column, and another will provide a description of the girdles. Completion: 2006.
- 11.5.3 Taxonomic revision of the Dinocephalia (with Dr J A van den Heever, University of Stellenbosch) (ongoing project). The Dinocephalia are a large and important group of synapsids known only from southern Africa, China and Russia. This revision is a long-term project which will take a lifetime to complete, as the animals are large and take a long time to prepare.  
Taxonomic revision of the Anteosauridae. Completion December 2006.
- 11.5.4 Taxonomic revision of the "Biarmsuchia". The "Biarmsuchia" are considered to be the most primitive therapsid taxon. Fossils of this group have been found in the Permian rocks of only South Africa and Russia. In order to understand the ancestry of the therapsids from the pelycosaurs. During 2006 a redescription of the cranial morphology of *Hipposaurus* will be completed in collaboration with Prof Chris Sidor. Completion: December 2006
- 11.5.5 Description of new dicynodonts from the lower Beaufort Group. An exciting small skull of *Eodicynodon* was collected above the first maroon mudrocks of the Beaufort Group by Charlton Dube in the Prince Albert Road area. A draft manuscript has been written by Zubair Jinnah and Bruce Rubidge. Completion: June 2006.
- 11.5.6 Rhinesuchid amphibian taxonomy. This much neglected amphibian group are the only temnospondyls from the Permian of South Africa and are critically important in temnospondyl phylogeny. This project is in collaboration with Dr R. Damiani and Ms E. M. Latimer. Completion: December 2006
- 11.5.7 A taxonomic and cladistic re-assessment of Triassic dicynodonts. This project is in collaboration with Dr PJ Hancox (Geology) and involves studying fossils from different countries including China, Germany and the UK. Completion; June 2006.
- 11.5.8 Postcranial anatomy of therocephalian therapsids. This project is an extension of the PhD project of Heidi Fourie (Transvaal Museum) who completed her thesis under the

supervision of Professor Rubidge. Fourie and Rubidge have written a draft manuscript on the postcranium of *Ictidorhinus* and are in the process of finalising this. Completion: July 2006

- 11.5.9 The bio- and lithostratigraphy of the Permo-Triassic boundary in the northern part of the Karoo Basin. Anthony Rutherford is in the final stages of completing his MSc on the bio- and lithostratigraphy of the middle Beaufort in the Thaba Nchu area. He has been doing this on a part-time basis since 2004 under the joint supervision of Dr John Hancox and Prof Bruce Rubidge. Completion: June 2006
- 11.5.10 Database of Karoo fossil localities: For her PhD thesis Ms Merrill Nicolas has embarked on the very large task of compiling a GIS database of all fossils housed in South African Institutions with data on their localities. This project, under the supervision of Prof Bruce Rubidge, will have important implications for understanding and enhancing biogeography, biodiversity and Biostratigraphy of continental faunas of the Permian and Triassic periods. Completion: June 2006.

## 11.6 Dr A Yates

- 11.6.1 Continue National Geographic project. The final National Geographic trip to Heelbo will be held from 12 March to 1 April 2005. Dr Yates expects to submit the first reports on the new sauropod to a high profile journal by the end of 2005. Date of completion: ongoing
- 11.6.2 Revision of the phylogenetic relationships of certain Chinese sauropodomorphs. Continued collaboration with Dr Lü, and a potential return trip to china to study newly collected dinosaur remains is planned for 2006 or 2007. Completion: Ongoing
- 11.6.3 Measuring of stratigraphic columns at Damplaats (Northern Karoo Basin) and Barkley Pass (Southern Karoo Basin) upon which precisely located diagnostic dinosaur remains can be plotted in order to determine if dinosaurs yield any useful fine-scale stratigraphic discrimination within the lower Elliot Formation (Late Triassic). In collaboration with Dr. Neveling. Completion: Ongoing, first paper in 2006 [What is the status of this project, you do not report on it.](#)
- 11.7.3 Finalisation of a rediagnosis and redescription of *Plateosauravus cullingworthi* a potentially abundant index taxon for the Late Triassic in South Africa. A paper entitled “*A redescription and revised diagnosis of the sauropodomorph dinosaur Plateosauravus cullingworthi (Haughton) from the Late Triassic of South Africa*” is in the final stages of preparation. Completion: 2006.
- 11.7.4 Preparation of a manuscript redescrbing the forgotten South African dinosaur “*Eucnemosaurus fortis*”. This rare dinosaur is a diagnostic taxon that includes material described as *Aliwalia rex*. Nevertheless it is an important because it is geographically widespread, stratigraphically restricted. It is also the sister taxon of a South American taxon, *Riojasaurus incertus*, and thus can help with intercontinental correlation. Completion: December 2005. [What is the status of this project, you do not report on it.](#)

11.7.6 Together with RR Reisz, Dr Yates will be researching dinosaur developmental digit shift. A paper is in advanced stage of preparation. Completion: March 2006.

## 11. CONCLUSION

With the devolvement of the running of Research Institutes from the Research Office to Science Faculty several funding and management changes have occurred. The research activities of the Institute now fall under the University approved Research Thrust “Evolution of Species and National Heritage”. Bruce Rubidge, as champion of this thrust was required to write up the required documentation for the thrust. So far no material benefits of being a member of this Thrust are evident.

At the beginning of 2004 the Palaeoanthropology Research Unit for Research and Exploration (PURE) based in the School of Geosciences under the leadership of Professor Lee Berger, and the Sterkfontein Research Unit based in the School of Anatomical Sciences under the leadership of Professor Phillip Tobias, were united in an umbrella Institute known as Human Evolution Institute for Research (HEIR) under the part-time research directorship of Professor Trefor Jenkins. For administrative purposes Professor Paul Dirks, with the approval of the DVC Research and the Dean of the Faculty of Science, placed the administration of all palaeontological research and teaching in the School of Geosciences under Professor Rubidge.

Dr Mike Raath has been put in charge of all the fossil collections at the University. In this capacity he has had to fulfill a very difficult role as the collections are housed in widely separated facilities in the School of Anatomical Sciences and the School of Geosciences and is required to be both at Medical School and on Main Campus at the same time in order to attend to the requirements of visiting scientists who wish to study specimens housed at the University. I am extremely grateful to Dr Raath for the diligent way he carries out his difficult task of maintaining and cataloguing collections, following up daily queries from scientists around the world, attending to the research requirements of scientists from Wits and other institutions, applying for loan permits from SAHRA, chasing up overdue loans and formulating policy for the collections to satisfy the requirements of the Code of Ethics of the South African Museums Association.

In line with the recommendations of the review of the School of Geosciences which was undertaken in 2003, Bruce Rubidge and Trefor Jenkins spent considerable time in 2004 lobbying with the Department of Science and Technology (DST) and writing proposals to obtain funding to support the almost R3 000 000 required to maintain the collections and the excavation and preparation of fossil on an annual basis for both the BPI and HEIR. I am happy to report that DST generously allocated R 2 783 550 to wards the maintenance of our collections as a National Facility during 2004.

The Wedge Building, which already houses part of the research activities and collections of the BPI, is being developed as “The Origins Centre”. When completed, this facility will house

research and museum facilities for the BPI Palaeontology, HEIR and RARI (Rock Art Research Institute). RARI have already raised sufficient funding to undertake the necessary building modifications for their research and display needs and building will commence in 2005. The BPI Palaeontology still has to raise the necessary funding set up exhibits and to renovate the building, but when the vision of a combined Origins Centre is achieved it will be a major tourist attraction for the city of Johannesburg and an internationally important research centre for the University.

During 2004 the School for Geosciences hosted the conference “Geoscience Africa” under the leadership of Professor TS Mc Carthy. This was an ambitious undertaking which drew several hundreds of delegates and incorporated the following participating societies: Geological Society of South Africa, Palaeontological Society of South Africa, South African Institute of Engineering Geologists, South African Geophysical Association. The BPI Palaeontology was very involved in the organization of the conference and Jacqui Thobois (the BPI secretary) had the huge role of being conference secretary, a task which she fulfilled with precision and dedication under very demanding circumstances. Almost half of the palaeontological papers presented at the conference were by staff and students of the Institute and attests to the dominant role that the BPI has in maintaining and researching the fossil heritage of South Africa.

Despite the drop in morale caused by the unwieldy review process in 2003, the relatively small academic staff complement of the BPI were responsible for the publication of 21 category 4 articles (DE recognized) in 2004. This attests to the enormous dedication and passion of every member of the academic staff toward carrying out research. BPI staff have been active in both undergraduate and postgraduate teaching, and during 2004 twenty-one MSc and PhD students were registered for projects at the BPI. This is a large number of students for the Institute and adds greatly to the lively research atmosphere which exists.

Apart from the educational outreach activities undertaken by the BPI which have been reported earlier, staff of the Institute were involved in numerous other palaeontological service activities during 2004. Staff continued their involvement in the development of the World Heritage sites in the Cradle of Humankind, as well as in the management and development of the Makapans Valley toward World Heritage Status. These activities, which require endless meetings with various stakeholders, are all toward the greater good of palaeontology of South Africa and BPI staff generously give of their time to develop these worthwhile endeavours.

The DST has recognised that Palaeontology is a field in which South Africa has a competitive advantage, and wishes to launch an “African Origins” science platform. Paul Dirks, Bruce Rubidge, Lucinda Backwell, Lee Berger and Marion Bamford were involved in researching and writing up a 200 page document on the State of Palaeontological Research in South Africa for the DST during March 2004. Later in the year Bruce Rubidge was asked to chair a DST appointed committee which was tasked to write up the documentation for an African Origins science platform.

During the reporting period volume 40 of *Palaeontologia africana* was finalized under an editorial panel led by Marion Bamford (Editor) with Mike Raath and Bruce Rubidge (Associate Editors). This journal enjoys a good reputation and a steady number of papers relating to the

palaeontology of Africa are being submitted by authors from many countries outside South Africa. I am grateful to Dr Bamford for the many hours of dedicated hours she and her editorial team unselfishly put toward the production of this journal.

This report details the varied research activities undertaken by the BPI during 2004, but by its nature such a report does not highlight the very great role that the technical staff of the Institute have played during the year. Without the dedicated work of Wayne Costopoulos as principal technician and technicians Charlton Dube, Joseph Sithole, Pepsin Makunela, Doctor Mbensi, Nthoapa Ntheri, Gladys Ndlovu and Sam Tshabalala research and maintenance of the collections would not be possible. Jacqui Thobois, as secretary of the BPI, is the motherly figure and always remains calm despite the very many onerous demands made on her by very many people on a daily basis. The productivity of this Institute is enormous considering the relatively small staff complement. This has been possible only because of the dedication of the staff who are all driven by passion for their science. I am greatly indebted to the BPI staff for all they do.

Bruce Rubidge  
**DIRECTOR**