# *Geological Society of Zimbabwe*

# *Newsletter*

February 2017 No. 1 of 3 of 2017

**The last great dino hunt, Kariba lakeshore, January 2017**
Joint Environmental Studies Institute, Wits; Natural History Museum, Kensington; National Museums and Monuments expedition
*Photo: Lucy Broderick*

www.geologicalsociety.org.zw

The Geological Society of Zimbabwe, P.O. Box CY 1719, Causeway, Harare

# Contents

# Editorial

Through dint of hard work and perseverance Darlington Munyikwa managed to secure permits from the Research Council and National Parks for members of the Evolutionary Studies Institute (the old Bernard Price Institute merged with the Wits palaeo-anthrapologists) to visit the Sibilobilo islands and part of the Matusadona lake shore on Kariba. This recce trip was in the company of Dr Paul Barrett from the Natural History Museum in Kensington, London, Darlington Munyikwa and Mike Zondo of our own Museums and Monuments, guide Steve Edwards and host Dave Glynn. Jonah Choiniere mustered the funding and enthusiasm with Rowen McNiven from San Francisco making a generous contribution. Dr Pia Viglietti and PhD student, Kimi Chapelle, did much of the hard ground work whilst the Broderick's were invited to provide local support and background information. Ali, unfortunately, was visiting family in Algeria and France.


On a bone site with the Environmental Studies Institute, Wits and Paul Barrett of the Natural History Museum, Kensington, January 2017.
L to R: Darlington Munyikwa (NM & M), Jonah Choiniere (ESI), Coster (Captain), Rowen McNiven, Simba (Crew), Never (Crew), Dave Glynn, Trish Broderick, Kimi Chapelle (ESI), Tim Broderick, Pia Viglietti (ESI), Godfrey (Cook), Lucy Broderick, Mike Zondo (NM & M), Paul Barrett (NHM, London), Steve Edwards
*Photo: Lucy Broderick*

With the lake level at its lowest ebb the time was ripe for investigation of the exposed shoreline, notably along the wave-sculpted scarp slopes of the islands and in the vicinity of Musango Island in the Ume estuary. Although bone was widespread on most islands, its occurrence tends to be isolated. However, a good coverage and understanding of the

prevailing geology was gained. Steve Edwards had been noting fossil locations since he started at Musango in 1990. Visits to these locations proved fruitful and the conclusion is that the area warrents the planning of a more focused expedition when excavation sites can be identified and developed where there is the potential for proving the presence of both archosaur and prosauropod remains.

Jeff Chaumba, now at the University of North Carolina at Pembroke, gave a talk to the Society on 16th December entitled "A brief outline of the geologic evolution of the southern Appalachians, USA, and some of its associated metals mineralization". In the Appalachian regionhere were three diachronous Palaeozoic Mountain-building events or orogenies, the last being the Alleghanian Orogeny 325 to 260Ma ago.


To find out more about the ongoing influence that Africa is having upon the face of North America, Jeff's *Power Point* can be viewed on our Society website along with many more records, including those of the November and previous Summer Symposiums and of historic Newsletters.

Dr Poppe de Boer of Utrecht University in The Netherlands is the visiting lecturer sponsored by the International Association of Sedimentologists (IAS) to Mozambique, South Africa and Zimbabwe. He is to address the Geological Society of Zimbabwe in Harare on Friday 31st March 2017 on the subject of "Modern versus ancient controls on sedimentary systems". His abstract is reproduced in this newsletter. We look forward to welcoming Poppe, and will advertise his address closer to the time. Thanks are due to Dr Emerse Bordy of UCT for suggesting that Poppe extends his visit to Zimbabwe.

This newsletter would not materialize without the support of our regular contributors to whom grateful thanks are extended.

*Tim Broderick*

# Chairperson's Chat

*Brent Barber*

My tenure as the Chair of the Zimbabwe Geological Society, the second time that I have had the honour of serving in this position, is drawing to an end. That the year has gone by so quickly is difficult to believe – you may remember how long a time it used to 'feel' between birthdays, Christmas and school holidays ……

Pleasingly, through the efforts of your Committee, my belief is that the incoming Chairperson, Maideyi Meck, is taking over a well functioning organisation. Not that your Society isn't facing challenges. Amongst these are the issue of providing greater representation nationwide. An example being that we annually award prizes to students from the Bulawayo School of Mines and Geology Department of the University of Zimbabwe. This was previously sufficient but isn't any longer. A change in this appreciation is required.

Once my time of heading a committee has ended I have previously always stood-down. However, in this instance I will stay with the ambition of:

- Assisting in tackling the conundrum facing geoscientists in Zimbabwe over Professional Registration including continued knowledge development. A Special Meeting of the Society will be convened in the coming months directed solely at addressing this issue and providing members with a platform to air their views and offer direction.

- Initiating the organisation of an international geological conference, drawing on the goodwill and expertise of the geoscientific community both in and outside Zimbabwe. It is hoped that such an event will bolster and stimulate our chosen fields of practise and maintain Zimbabwe with its supurb geology in the limelight.

In closing, I would like to thank all for the support given to the Committee throughout the year. To merely report that its member have done a sterling job is a gross understatement.

# Conference

11th International Kimberlite Conference, Gaborone, Botswana 18-22 September 2017. 50 years of Diamonds in Botswana

# Articles and Reports

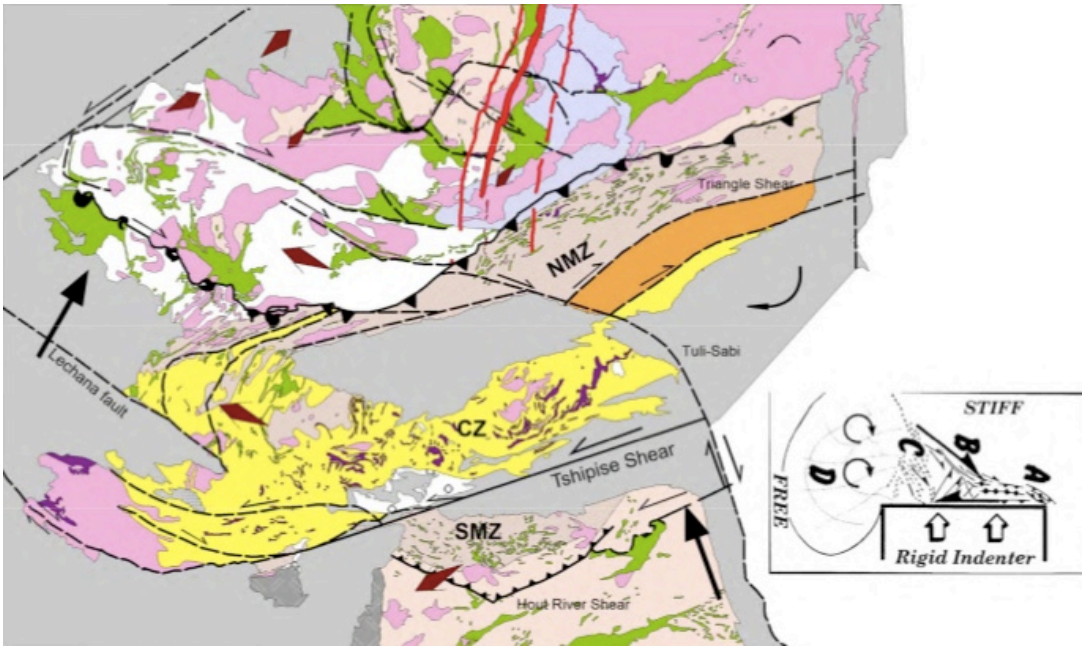
## Framing Himalayan-Tibetan style indenter-escape style collision for a Neoarchaean Limpopo orogen and Zimbabwe Craton since 2.75-2.74Ga

Mark Tsomondo
mtsomondo@metcorp.co.uk

The high grade Limpopo Metamorphic Belt comprising the Northern and Southern marginal zones and a larger near-axial Central Zone has been the subject of multidisciplinary research based on an integration of geological-geophysical and P-T-t path studies. Yet there are at least five contrasting models for parts of the entire Limpopo Belt and several workers increasingly cast doubt on uniformatariian analogues for the belt. Early versions of the Himalayan-Tibetan indenter-escape style collisional tectonics were regarded as largely 'untenable' on shear-sense evidence or ignored in models of complex thrust-stacked granite-greenstones. Elsewhere, a postulated westward, lateral ramp-like tectonic escape of the Central Zone on sinistral and dextral shears in the Archaean was also rejected in favour of a Palaeoproterozic age of dextral transpressive motions on the zone-bounding the Triangle and Palala-Tshipise ductile crustal-scale shears. Thus a coherent and predictive global geotectonic framework for a collisional Limpopo orogen between the Zimbabwe and Kaapvaal cratons has hitherto remained elusive, including for other reasons such as, 1). the unresolved structural/tectonic issues on the nature of convexity of the southern margin of the Zimbabwe Craton with the Limpopo orogen, 2). model-driven assumptions on hinterland-foreland relationships, plate and plate boundary definitions and width and, 3). failure to define assymmetrical tectonic escape structures such as an east-tapered Centrral Zone, 'the smoking gun' of Neoarchaean oblique convergence, as defined in this paper.

By extending studies on corner-indentation by the 3.35Ga Mont d'Or Granite in the Shurugwi Belt and conjugate faulting together with detailed consideration of results of pertinent analogue modelling, this study frames indenter-escape tectonics for the Limpopo orogen during a Neoarchaean dextral oblique convergence between a stationary Tokwe protocraton and a NNW-directed subduction-driven Kaapvaal protocraton of the Kalahari Craton, since 2.75-2.74Ga. Such an older start to the entire Limpopo orogeny (ending at ca 2.5Ga) has far-reaching geodynamic consequences for not only the subzones of the entire Limpopo orogen, but also the evolution of 1). the ca 2.7Ga Ngezi Group of the Belingwe Greenstone Belt, 2). intrusion of the 2.75-2.74Ga komatiitic Mashaba Ultramafic Suite and, 3). the older >2.74Ga komatiite-dominated Mutare Greenstone Belt as being indentation-linked rather than mantle-plume induced. Yet most researchers have divorced the origin and deformation of the Belingwe Belt from a Limpopo hinterland, despite 1). its proximity and high angle trend (hence it is a strain gradient marker) to the ENE-trending Limpopo orogen, 2). a postulated NNW-directed foreland-type (topmost) Cheshire Formation in the Belingwe Belt, and 3). location of the belt within the very frontal domain of the Tokwe indenter of this study. Did rotational strains assist in the preservation of kernels of low strain? Is the Mtshingwe Fault a domain of ductile dextral trishear fault-fold propogation, pre-Great Dyke? Is it part of a distributed dextral ductile shearing including the Jenya Fault? What is the link between distributed dextral strike-slip and the convergent thrusting in the North Limpopo Thrust Zone?

In sum, the fundamental weakness in applying uniformatarian and mechanical analogue models to block kinematics and tectonic reconstructions based on indentation-extrusion in the Archaean of both the Zimbabwe and Kaapvaal cratons are a general lack of definition of the archetypal shape, size and convergence of the initial protocraton indenters and subsequent effective indenters.



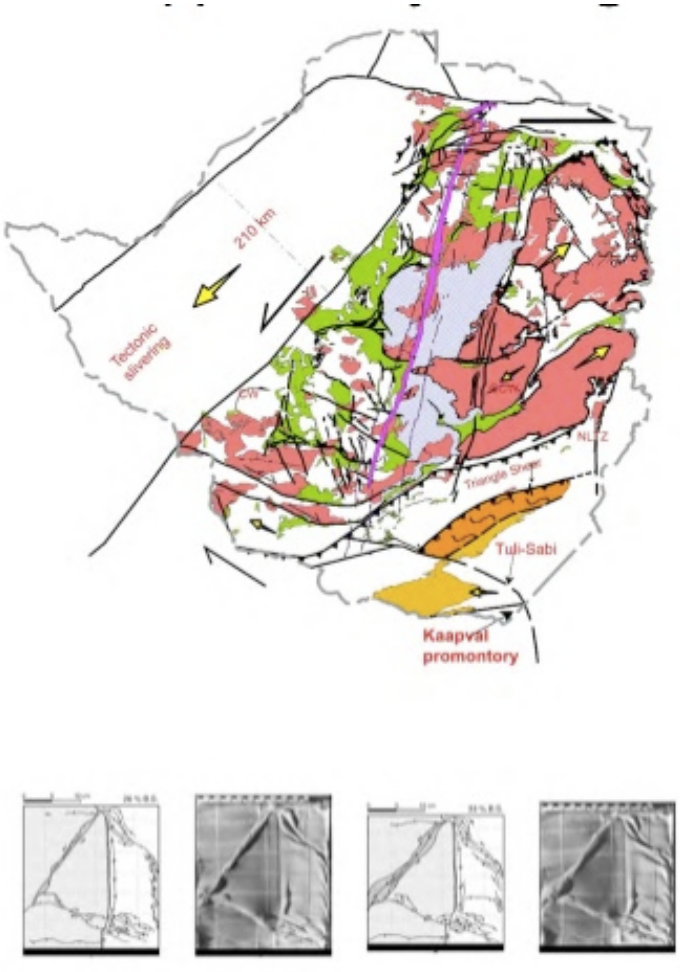

Tectonic domain map of the Limpopo orogeny assuming a rigid Kaapvaal protocraton indenter

## A field trip to the western margin of the Murehwa Batholith

Led by Mark Tsomondo, 26th November 2016

Stop 1 was at sheared gneiss forming the structural footwall to the Murehwa granite batholith between Juru Township and the Nyagui River. Here banded and foliated gneiss is cut by predominantly dextral shears with moderately inclined, up to 45$^{o}$ easterly dips. The sheart zone trends and shear sense are both anomalous in terms of Treloar and Blenkinsop's 1995 intraplate strike-slip model whereby shears with NE trend are sinistral and ESE trend are dextral. Such dextral shears would be inconsistent with a simplistic NNW-SSE regional compressionlinked to the Limpopo orogeny. Alternatively transcurrent shearing within the structural footwall to the 2600Ma Murehwa Batholith way relate in part to a dextral trastension. Discussing transtensional tectonic controls versus vertical emplacement of granites in the Zimbabwe Craton, it was noted that east of the Great Dyke there is a distinct younging towards the ENE and NNE that is yet to be explained, including the peculiar fan shapes of intrusions that are reminicent of tectonic escape structures under a form of constricional flow. It was also noted that the Arcturus extent of the Harare Greenstone Belt is wedge-shaped eastwards being bounded by sinistral Umwindsi and dextral Chinyika shear zones. This suggests an escape to the east with rotation to the NE under N-S regional shortening, a similar direction noted in the emplacement of the late porphyritic phase of the Chinamora Batholith.

Mark Tsomondo discusses his indenter-escape concept as adapted to the emplacement of the Murehwa Batholith. *Photo: Tony Martin*




Tectonic domains within the Zimbabwe Craton as supported by analogue modelling

Stop 2 was at the southern extent of Domborembudzi Mountain where an outwardly massive granite displays cm-scale syn-magmatic and solid-state foliations including magmatic

layering where K-feldspar megacrysts show a northerly alignment and coresponding shallow easterly dip to the bounding gneissic footwall.

Due to threatening rain stops 3 and 4 where omitted and Stop 5 in a road cutting just beyond the Chivake River was visited. This exposes an oblique section of complex tonalitic gneiss with a sub-horizontal attitude and a porphyroclastic style of shear that are internal to the batholith. The overall impression implies a NW-directed intrusion to this margin of the Murehwa Batholith. Rain stopped play.

## Adrift again: recent geochronology and palaeomagnetics undermine a Neoarchaean collision model for the Limpopo Belt

Jan Kramers
jkramers@uj.ac.za

Some of the first radiometric age determinations from Africa were carried out on metamorphic minerals from the Limpopo Belt and they yielded ages around 2600Ma. Subsequently wholerock Rb-Sr as well as zircon U-Pb ages on granitoid intrusions, mainly in the Central Zone (CZ), were used as time markers. These included the Singelele suite of S-type granites occurring interlayered with metasedimentary rocks. Neoarchaean ages between 2600 and 2700Ma dominated the data. High grade metamorphism, observed throughout the Central Zone as well as in the Northern (NMZ) and patchily in the Southern (SMZ) marginal zones, was then naturally linked to this evidence of crustal melting and thereby also dated to the Neoarchaean. Throughout the 1980's the concept of a Neoarchaean Limpopo orogeny was built and consolidated, with structural, metamorphic and geochronological studies mainly carried out or co-ordinated by the Geology Department at the Rand Afrikaans University in Johannesburg with seismic studies by the University of the Witwatersrand. It was based to a large extent on work in the CZ and SMZ, with the NMZ receiving relatively little attention. The model that emerged was essentially one of a continental collision between the Zimbabwe and Kaapvaal cratons, producing a mountain belt of Himalayan proportions. From crustal structures, a south-dipping subduction zone was envisaged to have preceded the collision.

Then from the mid-1990's on, ages around 2030Ma obtained from metamorphic mineral assemblages (lead isotope dates mainly on garnet and argon dates on amphibole and micas) accumulated. These were mainly from the CZ, and in most cases were associated with shear zones, but were also found in the Northern Marginal Zone. Further research in the CZ revealed many such young metamorphic zircon ages, clearly indicating two episodes of high grade metamorphism. Research groups were divided into two camps regarding which of these two events was associated with the amalgamation of the two cratons; the 2000Ma camp proposing a dextral transpressive orogeny at that time. Nevertherless the Neoarchaean Himalayan model continued to dominate mainstream thinking, while later major strike-slip movements along the belt, possibly associated with the Kheis-Magondi orogeny, were acknowledged to exist.

Jan Kramers delivers his keynote address to the 2016 Summer Symposium *Photo Andrew du Toit*

The picture has now changed again. Since 2000 a great deal of hafnium isotope work on zircons from the Central Zone and the Francistown region, combined with neodymium isotope work on the NMZ and Zimbabwe Craton has suggested that there was northwards subduction underneath the NMZ and along the Craton margin, which fitted with the idea that the CZ could be a leading continental edge. But now the chronology did not fit with the collision model. This subduction zone should have existed at around 2600Ma. However, more recent geochronological work, mainly U-Pb on zircon but also Ar/Ar on amphibole, in the SMZ has shown that peak metamorphism there occurred at around 2730Ma. If the collision followed on subduction of an ocean crust, then the metamorphism in the SMZ should postdate it, not predate it by >100Ma. In addition a palaeomagnetic and regional facies reconstruction places the Pilbara Craton only 100km north of the Kaapvaal margin at 2700Ma, a position overlapping with the present position of the Zimbabwe Craton.

It follows that the Neoarchaean tectonometamorphic event in the SMZ must be considered separately from those in the CZ and NMZ. One possible suggestion for the latter could be that they represent an Andean-type continental margin; the regionally rather high concentrations of U and Th mean that no excessive crustal thickening or heat advection from below is necessary to generate high grade metamorphism and even melting in the lower crust. The SMZ on the other hand is, like the Kaapvaal Craton, a province of low U and Th content, and here considerable crustal thickening and/or anomalous heat flow is required to cause the high grade metamorphism. If a continental collision occurred here at around 2730Ma, the resulting assembly has been broken up since and we do not know where the other part is.

Regarding the 2030Ma event, this has now been detected in Ar/Ar dates on amphiboles and micas in the SMZ. The rather sharp isochronism of this event over a very large area, and its close coincidence with the age of the Bushveld Igneous Complex, possibly suggests magmatic underplating of the crust during this igneous event. With the crust weakened, strain from large-scale tectonic forces could have been focused in the Limpopo Belt, leading to extensive shearing and at least a repositioning of the two cratons relative to each other.

# Modern versus ancient controls on sedimentary systems; the present is not always the key to the past

Poppe L. de Boer
Sedimentology Group, Utrecht University, P.O Box 80.115, 3508TC Utrecht
The Netherlands

The basic idea of uniformitarianism dates back to the late 18th century - when Hutton, Whewell, Lyell and others proposed the idea of uniformitarianism in contrast to catastrophism. The idea is that physical and chemical laws have not changed, and that also in the distant geological past sedimentary processes have acted as they do today. However, various types of sedimentary processes and deposits, e.g. large-scale black shale deposition during the middle Cretaceous, the deposition of up to 4km-thick evaporites in large basins, the rise and fall of dinosaurs during the Mesozoic, testify changes in the controls of sedimentary processes in the course of geological time.

The Black Sea is considered one of the end members of marine systems with black shale deposition, the other one being upwelling zones along continental margins. Why is the Black Sea the only example of the "black-sea model" today, and when and where did such a situation occur in the past? Why is extensive anoxia, as in the North Atlantic and Tethys Oceans during the middle Cretaceous, not encountered in present-day oceans?

Orbital (Milankovitch) forcing, that is forcing of climate and oceanography by varying eccentricity, obliquity and precession, has been active throughout geological history. Orbital cyclicity in marine and terrestrial sediments is reported, however, much more frequently from certain stratigraphical periods (e.g. Cretaceous and Jurassic) than from others. Is this due to variations of the orbital parameters and their influence on climate and oceanography, or are other factors involved?

Saline Giants, accumulations of evaporitic salts of up to several kilometres thick, have been intermittently deposited in sedimentary basins during some few 100,000 years, on average about once every 5 million years. There are no recent examples of such large basins with evaporite salt accumulation. The Miocene Mediterranean example, which formed during the Messinian Salinity Crisis some 5.5 million years ago, is the most recent one. Is the absence of present-day saline giants accidental or are conditions different from the past? Can we expect other saline giants in the future, and where?

The present-day Earth's surface with high mountains (Himalaya, Andes) is not representative for various other parts of the geological record. For example, after the break-up of Pangea major plate collisions were largely absent, with consequences for the continental relief and the character and extent of terrestrial and shallow marine environments. Such differences may explain biological evolutionary trends and the occurrence of sedimentary facies without recent analogues. For example, the rise and fall of dinosaurs may be related to the gradually changing face of the Earth during the Mesozoic, rather than to a catastrophic event.

# LINLEY ALICE LISTER MSc, DPhil, PGSSA
## 5th August 1936 – 15th December 2016

Many may not have really known the Person who was amongst us, whether she may have been met at Pleasant Ways, within the realms of music, as a fellow teacher, a student in the lecture theatre or in the field, or even as a member in an audience at one of her talks on the subject of *Final Exit*. For we all have a story, and I hope that I can impart to you just a little on the Life of Linley Alice LISTER, who was born KING in Pietermaritzburg on 5th August 1936.

Linley was born to her Mother, Molly – a New Zealander, and Father – Lester Charles King. Lester had emigrated to New Zealand from London in 1925 to be a teacher in a subject in which he was to become World renowned – that of the shape and evolution of our own Earth. With degrees behind him and an interest in playing the cello, he and Molly then moved to their new home in South Africa in 1934 where Lester took up a post as Lecturer at the University College of Natal in Pietermaritzburg. Here Lester earned his further degrees in the subject of the Earth he loved from UNISA and the University of New Zealand, he wrote his famous textbook *South African Scenery*, became Professor in 1946, was president of the South African Geographical Society and of the Geological Society, and a Fellow of the Royal Society of South Africa. In 1948 Lester was asked to found the Geology Department at the University of Natal in Durban, and the family moved to their new home at 314 South Ridge Road in Glenwood, where more books and papers on geomorphology, seafloor spreading and an expanding Earth were born.

The influence on Linley was overwhelming. She had already become proficient at playing the piano and the vibrant atmosphere of ideas on how the surface of the landscape around her had evolved was electric. Perhaps there is little wonder in the fact that she followed in her Father's footsteps and achieved in her own right. Linley gained her BSc (Honours) degree in Geology in 1958 and, whilst teaching in her subject back in Pietermaritzburg, achieved her Masters Degree with distinction on her study of the *Post Karroo Stratigraphy across Durban*. She presented this research at the First Annual Congress of the Geological Society of South

Africa held in Johannesburg in 1958, a meeting also attended by her father and by a person who would have a further great influence in her life, one Geoffrey Bond. In 1959 Linley was to write a joint paper with Lester on their ideas on a structure known as the Natal Monocline, which dominates the scenery of South Africa northwards from Hluhluwe through Swaziland to the Lebombo Range marking the eastern border of South Africa with Mozambique.

There was a need for Linley to spread her wings and in 1961 we find her teaching in the Department of Geography at the University of Queensland in Brisbane, Australia. During 1962 and 1963, with the help of a small inheritance, we find Linley describing an amazing flight that had her hanging out of the aircraft window absorbing the morphological wonders that passed beneath her up the length of Africa to Israel and Iran, over Pakistan and India to Thailand, Hong Kong, Japan, the Philippines and Singapore, and then across the Indonesian archipelago to her roots in New Zealand and back across the expanse of Australia via the Cocos Islands and Mauritius to her home in Durban. Then, gathering her belongings, Linley flew to Salisbury in April 1963 to join Professor Geoffrey Bond as junior lecturer in geomorphology in his fledgling Geology Department at the University College of Rhodesia and Nyasaland. It was not long before they, with colleagues Clive Stowe and John Morgan moved from their temporary hut to the new aluminium-clad Geology Building, which became known as 'Bond's Biscuit Box'. The six inaugural students of 1960 gained their degrees, four of whom continued to Special Honours in Geology. It is true to say that Linley had an influence on the lives of every student, some 850 individuals, who passed through the Geology Department up until the time of her joint retirement with Professor James Wilson on 31st December 1996.

Linley was given the intricacies of crystallography to teach and, apart from geomorphology, her lecturing load included imparting the detail of South African stratigraphy. She became Senior Lecturer in 1975 and when Geoff Bond was appointed Deputy Vice Chancellor and Vice Principal to the University in 1978, Linley took on the teaching of palaeontology to the students. As number two in the Department, she would take on the administration should it be either Bond or Wilson who was away, and time-tabling became her forte. Not only did Linley lecture to the Geology students but she also gave talks at schools and was author to a book, *African Landscape Studies*, based on a TV lecture series. She earned Honorary Membership to the student's Mennell Society and was elected a Professional Member of the Geological Society of South Africa.

Her interest in the game of badminton led her to meet her husband, Jim Lister, another ardent player. They were married on 31st August 1965. Linley took periods of sabbatical leave in the late sixties and it was Jim who accompanied her all over Zimbabwe and Malawi driving a Landrover in her quest to define and describe succeeding land surfaces and landforms as a basis for her DPhil thesis. Fellow lecturer, Dave Bowen, supplemented her analysis by flying her to observe much of the country from on high. Her 1967 publication on the *Erosion Surfaces of Malawi* remains current in that country and her doctorate on the *Erosion Surfaces of Rhodesia* was granted by the University of Rhodesia in 1976. During the intervening period, however, Linley applied herself to what might be considered her *magnum opus* in the formidable task of editing the 55 papers that comprise the proceedings of *Granite '71, a Symposium on Granites, Gneisses and Related Rocks* staged by the Rhodesian Branch of the Geological Society of South Africa and produced locally in 1973. Within the 509 pages of this tome rests Linley's own contribution describing the microgeomorphology of granite hills in northeastern Rhodesia. Linley was invited by the Director of the Geological Survey to abridge her thesis with the view to reproducing this as a Bulletin. This was eventually

achieved in 1987 following editorial work by Euen Morrison and assisted by Tim Broderick. The consequence of the publication of Bulletin 90 was that Linley was awarded the 1989 A.E. Phaup Award for the most important contribution to the furtherance of Zimbabwe geology in the period under review. She also became an Honorary Member of the Geological Society of Zimbabwe.

Linley Lister did not remain static in her passion to see the World for she spent two sabbatical leaves studying Alpine Landscape in Switzerland; she visited the Gregory Rift and Olduvai Gorge in East Africa; she taught as a guest at the University of Adelaide, South Australia and attended a palaeontology conference in Sydney; and then she visited some of the scenic wonders that grace the United States. She then took on various consultancies such as the study of soil erosion in the Sinamatella region of Hwange National Park, and took up an interest in the subject of 'medical geology'. Sadly, however, this momentum was checked with the unexpected death of her husband Jim on 26th February 1989 followed closely by the demise of her father, Lester, in Durban on 1st April of the same year. She remained in the family home at No. 7 Waller Avenue in Mount Pleasant, Harare and continued to sustain her lecture programme at the Geology Department until the time of her joint retirement with her great friend and colleague Professor Jim Wilson at the close of 1996.

Whilst maintaining her domestics of long service and her beloved dogs at Waller Avenue, Linley now turned her focus to rekindling her first love, that of music. She practiced daily on the piano, took lessons with Neil Chapman of the College of Music, held musical recitals with a group that involved Dawn Siemers and others, and she attended concerts and shows with her friends who included Dawn and Marina Bond.

It was only in 2008 that the decision was made to sell the house at Waller Avenue and to buy into Pleasant Ways where she acquired a cottage. Linley effected the move on her own, a monumental task of down sizing but also involving the difficult decision to put down her dogs. However, her music went with her and she continued to be part of a musical group led by Dawn Siemers and to impart joy in her new community. Her love for opera and the classics was satisfied through her formidable collection of some 312 compact discs.

Linley had always held an interest in the *Living Will* and she involved herself with the local chapter of the international organization *Final Exit*, later to become its Chairperson. Together with colleague Keith Martin, Linley would regularly give talks to groups on various relevant subjects including the right to die with dignity. She authored the local Newsletter for Final Exit until 2010 before passing on the baton. She downsized again to a single room at Pleasant Ways and later, with her descent into Alzheimers, she was moved into a care facility. The love and support from her colleagues at Pleasant Ways and from her close friends continued until her peaceful passing on 15th December. We all lived with and were enriched in some way by the life of this many-facetted, unassuming, meticulous and intelligent person whose life we celebrate.

Tim Broderick
*With the help of so many*

# News

## Geology Department, University of Zimbabwe

*Maideyi Meck*

The Geology Department continues to do well. There have been some minor staff changes with the departure of Messrs **Lameck Maninji** and **Demand Gwatinetsa**. The remaining staff remain unchanged. The university has now filled the professorial chair for mining-related departments, which is funded by ZIMPLATS. **Prof. M. Ityokumbul** is the professorial chair and will be leading the departments of Geology, Metallurgy and Mining Engineering. Teaching programmes progressed well, and the department managed to carry out assessments for all attached students. Many thanks to those mining houses who facilitated these assessments. The department hopes the mining industry will once again accommodate our students for the crucial experience that they need this coming year.

Five of our students from the first group following the straight honours degree programme have now been employed. The department witnessed and celebrated the graduation of 12 students on 29th September. However, the department remains under resourced in terms of its ability to function efficiently and effectively.

**Contact details as of February 2017:**

| Name | Position | Email | Cell | Office Number | Office Phone 04-303211 (Extension) |
|---|---|---|---|---|---|
| Prof M Ityokumbul | Chairman | | | | 15032 Secretary |
| Dr T. Njila | Senior Lecturer | drtnjila@gmail.com | 0783696888 | 21A/5A | 15029 |
| Dr M.L. Meck | Senior Lecturer | mabvira@science.uz.ac.zw | 0772906612 | 25 | 15027 |
| Dr M. Tewelde | Senior Lecturer | mulugheta1@yahoo.com | 0775471789 | 6A | 15030 |
| Dr. A. Martin | Lecturer | anthony.martin2107@gmail.com | 0772211224 | 2A | 15036 |
| Mr. T. Marova | Lecturer | taka.marova@geofieldmining.com | 0773297796 | 3A | 15026 |
| Mr. F.B. Mupaya | Lecturer | fbmupaya@gmail.com | 0773599433 | 26 | |
| Ms. S.Ncube | Lecturer | sinikiwencube26@gmail.com | 0776746145 | 19 | |
| Mr. G. Chinoda | Teaching Assistant | grecie.chinoda@gmail.com | 0773000324 | 15 | 15025 |
| Ms. S. Sibanda | Teaching Assistant | selinasibanda64@gmail.com | 0782707852 | 1A | 15192 |
| Ms. N. Magaranhewe | Teaching Assistant | nancy.magaranhewe@gmail.com | 0774065415 | 18 | 15191 |
| Mr D. Maguze | Chief Technician | dmaguze@science.uz.ac.zw | 0712639792 | 24 | 15033 |
| Mrs G. Chipari | Secretary | gchipari@science.uz.ac.zw | 0772950681 | 21A | 15032 |
| Mr. F. Zihanzu | Technician | fzihanzu@science.uz.ac.zw | 0772218208 | 1 | 15024 |
| Mrs. E. Hamah | Technician | emhamah@gmail.com | 0773924053 | | |
| Mr. D. Mupambo | Technician | DIDYMUS@science.uz.ac.zw | 0772916652 | 16 | 15024 |
| Mr. P. Sena | Technical Assistant | psena@science.uz.ac.zw | 0772390026 | | 15193 |
| Ms. S. Gorogodo | Messenger/Cleaner | | 0772390026 | | 15029 |

# The Professor Tom Blenkinsop UZ Geology Field Trip Fund

Following the successful presentation of the 2013 A.M. Macregor Memorial Lecture in Harare and Bulawayo, and his lead of the field trip in the Renco Mine area, Professor Tom Blenkinsop made a generous donation of $200 to the Geological Society of Zimbabwe (GSZ). This was in support of University of Zimbabwe (UZ) geology student field trips. Over the years the UZ Geology Department has been under funded, resulting in their failure to raise sufficient money to conduct the mandatory field trips for its students. The GSZ responded by donating funds and materials from its own resources as well as from members. This assistance went towards the welfare of the geology students, especially in meeting costs for field trips.

Using the donation from Prof. Blenkinsop as seed money, the GSZ has now established the *"Professor Tom Blenkinsop UZ Geology Field Trip Fund"* to be administered by its Executive Committee. Tom has indicated an interest in supporting the Geology Department on a long term basis, not only to help in mobilizing funds for various activities, but by also providing moral and material support. Annually the students go on their main field trip, which lasts around 2 weeks with direct costs being in the range of $6000 per class. Therefore we are appealing to all our members to donate generously to this worthy cause both in cash or in kind. Materials such as fuel and food are most welcome.

The direct benefits that accrue to the geological profession are that it ensures a properly trained graduate. Referring to the adage that he best geologist is the one who has seen the most rocks, our students need quality field trips. From these field excursions we also want to develop the Zimbabwe Geology Atlas.

Your donations, either in cash or in kind, should be forwarded to our Treasurer, Collins Mwatahwa – E-mail: cmwatahwa@Angloplat.com or to our Administrator, Julie Kuhn - E-mail: geol.soc.zimbabwe@gmail.com

THANK YOU FOR YOUR GENEROSITY

H. N. Gumbo

ZIMBABWE

# Geological Survey Department

*Ernest T. Mugandani*
etmugandani@gmail.com

## Staffing

The department started the year on a sad note following the passing on of an accountant, **Garikai Francis Machengete** on the 15th January 2017 after a short illness. He had served the department for seven years. May his soul rest in eternal peace.

**Sokesimbone Lunga, Frank Muzanenhamo** and **Ms Sibongubuhle Mpindiwa**, all Principal Geologists, continue to act respectively as Provincial Mining Directors for Matabeleland South, Mashonaland West and Masvingo mining districts, while the writer continues as Acting Deputy Director for the department.

**Amicable Hove,** a former Cadet with the department, completed his BSc (Hons) Geology degree in December 2016 and is currently completing recruitment procedures with the Public Service Commission.

**Ms Charlaine Chatambudza,** a geological technician, was transferred from Mashonaland Central Mining District, Bindura to Harare with effect from 1st January 2017.

**Denis Bob**, Senior Laboratory Hand, assumed duty on the 1st January 2017 for a further six-months contract. However, thin section making consumables and repairing of the rock cutting machine is still to be done. This is likely to jeopardize the chances of our geological technicians from effectively benefitting from Bob's 37 years of rock laboratory experience before his contract expires.

## Training

**Mathias Ndoro, Abenezel Makuvaza, Joseph Chimhini, Ms Gengezha Vimbayi and Ms Portia Mungate,** all geoscientists, participated in the annual Japan Oil Gas Metal National Cooperation (JOGMEC) seminar, competition and workshop on remote sensing held in Gaborone, Botswana from 28th November to 9th December 2016. Zimbabwe participated in the competition for the first time since 2008 following the signing of the MOU with JOGMEC on 10th September 2015.

**Alice Mudzi, Nyasha Chimuka, Laiza Chibove** and **Marita Matsatswa,** all cartographers, **Tendai Kashiri**, senior geologist, **William Chiriseri** and **Esnath Mpomhori**, geological

technicians, participated in the training on Geoinformatics using ArcGIS for ditigital map production in South Africa from 28th November to 16th December 2016. This was a customized training course by ESRI, South Africa courtesy of African Development Bank (AfDB) funding under the Governance and Institutional Strengthening Project (GISP).

**Ms Emeldah Gengezha Vimbayi**, **Trust Magidi Tapiwa** and **Ms Mudyawabikwa Junior,** all geologists, are currently in Japan undergoing a month-long training on the Application of Remote Sensing in Geothermal Energy investigations and Geological Information Management for Mineral Exploration. The training was organised and sponsored courtesy of Japan International Cooperation Agency (JICA).

## Editing of Publications

Editing of the 12 geological bulletins, short reports and minerals resource series together with 7 maps is progressing well despite having missed the completion timelines due to a number of challenges. Editing of six of these publications has now been completed and the texts are being reviewed for conformity to required standards.

# MINING INDUSTRY NEWS

*Forbes Mugumbate*
fmugumbate@gmail.com

**Gold Production**

In January 2016 Minister of Mines and Mining Development, Walter Chidakwa, through a Memorandum to the Cabinet, set a national gold delivery target of 24 tonnes based on various assumptions. By end of year about 23 tonnes had been produced. With a contribution of 40% to the 23 tonnes of gold produced in 2016, small-scale miners can be said to be playing a significant role in national gold production. This contribution is expected to increase as gold production from large mines remain static as no new mines are being developed, and there is very little expansion on the ageing mines. Of concern, however, is the fact that although production figures may suggest a vibrant small-scale mining sector, the situation on the ground shows that there are very few small mines with the requisite infrastructure with which to sustain gold production. Most of them are haphazard diggings for subsistence mining. As a result, custom milling centres that process ore from whatever source have now become the most important areas supporting small-scale gold mining. Several Chinese companies have realised the lucrativeness of the custom milling business, and have established these mills in many gold mining areas.

**The Inaugural Gold Sector Awards, 2016**

To ensure a sustained increase in gold production, the Minister of Mines and Mining Development has introduced a scheme for awarding high performers in the gold sector. These awards and other interventions and incentives are expected to see gold production increasing to 28 tonnes in 2017.

The inaugural Gold Sector Awards event was held at a colourful ceremony on 20th January 2017 at the Harare International Conference Centre. The following prizes were awarded according to the category of the gold producer:

| **Category** | **Prize** |
|---|---|
| For the Best Gold Custom Miller in each of the eight provinces. | A generator each. |
| For the Best Small-scale Gold Miner in each provinces. | A compressor each. |
| For the Best Gold Buyer in each province. | A motorbike and a portable scale. |
| For the Best Overall Large Producer. | Royalty reduced to 3%. |
| For the Second Best Overall Large Producer. | Export Incentive Scheme increased from 2.5% to 3.5 % for a period of 12 months. |
| For the Most Improved Large Producer. | Export Incentive Scheme increased from 2.5% to 3.5 % for a period of 12 months. |

**The Chrome Mining Sector**

As a way of broadening indigenization in the chrome sector, the Government directed that 50% of claims held by both ZIMASCO and ZIMALLOYS be released and made available to other players. ZIMASCO has already released 22,746 hectares while negotiations with ZIMALLOYS are ongoing. The Minister has already released information on the details of how the released ground is going to be accessed. This will be distributed as follows:

| **Beneficiary** | **Purpose** | **Allocation (ha)** |
|---|---|---|
| Government (Zimbabwe Geological Survey) | Future development | **5746** |
| Medium-scale beneficiation plants & new smelters | To support beneficiation and value addition | **7000** |
| Small -scale miners<br>1. Individuals;<br>2. Special-interest Groups e.g. War Vets, Women, Youth & others | To promote indigenization and the empowerment of marginalised groups | **10,000** |
| **Total** | | **22,746** |

**The Platinum Sector**

The Government has made a fresh bid to compulsorily acquire land measuring 27,948 hectares of land held by Zimplats under Special Mining Lease Number 1. The new notice has repealed all previous notices issued in respect of the proposed acquisition of this portion of the mining lease area, but the company is engaging the Government of Zimbabwe on this matter.

**The Lithium Sector**

Exploration at the Zulu Lithium and Tantalum prospect located about 80km north-east of Bulawayo is progressing with the completion of 2500m of drilling and assaying that has

revealed encouraging potential. The prospect covering an area of 3.5 $km^2$ is regarded as potentially being the largest undeveloped lithium-bearing pegmatite in Zimbabwe. The area was first pegged in 1955 but was not explored until the early 1960's. The larger pegmatites are rich in spodumene and lepidolite whilst the smaller pegmatites have a petalite concentration.

---



---

**Notice** is hereby given that the Annual General Meeting (AGM) of the Geological Society of Zimbabwe will be held as follows:

**Date:** 24th February 2017 **Time:** 1700 hours
**Venue: The Country Club (CFX) Brompton Road, Highlands, Harare**

The Guest Speaker is **Dr Ali Ait-Kaci** who will be giving a talk on Algerian Geology.
A cost of $15 includes supper.

**K. Musiwa**
Hon. Secretary

## GSZ Research and Development Fund

Enquiries relating to the distribution of funds through this facility should be made through the standing Chairperson.

## SEG Timothy Nutt Scholarship Memorial Fund

This fund will be available to provide financial support for geology students and young economic geologists located in Zimbabwe or in Southern Africa with ties to Zimbabwe. The fund may be used to support SEG student chapter activities, travel to meetings, field trips, for research or study grants, technical lectures or any other activities approved by the SEG Regional Vice President for Africa.

# Applicants must describe what the project is, why the research is important and how it is to be done.

# An estimate of expenses for the project must be included with the application.

# Grants are expected to be fully utilized by year-end.

# Grant recipients are required to provide a year-end accounting of how the money was spent together with a suitable progress report or final abstract.

See the Society of Economic Geologists website for further details and the next call for applications.

# GEOLOGICAL SOCIETY OF ZIMBABWE:
## CONTACT DETAILS OF MEMBERS OF THE EXECUTIVE COMMITTEE FOR 2016

| NAME | PORTFOLIO | EMAIL |
|---|---|---|
| Barber, Brent | Chairman | barber.brent@gmail.com |
| Meck, Maideyi | Vice-Chairman & UZ Representative | maideyimeck@yahoo.com |
| Musiwa, Kudzai | Hon. Secretary | kudzimusi@gmail.com |
| Kuhn, Julie | Administrator | geol.soc.zimbabwe@gmail.com |
| Mwatahwa, Collins | Hon. Treasurer | cmwatahwa@angloplat.co.zw |
| du Toit, Andrew | Summer Symposium | andrewdutoitzim@gmail.com |
| Mugandani, Ernest | ZGS Representative & Newsletter | emghans@yahoo.co.uk |
| Bouammar, Houda | Talks & Meetings | Houda.bouammar@gmail.com |
| Chikandiwa, Nevison | Talks & Meetings | wchikandiwa@yahoo.co.uk |
| Ait Kaci Ahmed, Ali | | ali_aitkaci@yahoo.fr |
| Mugumbate, Forbes | Regional Representative | fmugumbate@gmail.com |
| Duma, Steven | Summer Symposium | Steven.duma@zimplats.com |

# Institutional Membership, 2016

Bruker RSA

Chamber of Mines of Zimbabwe

Freda Rebecca Mine

Goldsearch Technical Services

Metallon Gold

Mimosa

Murowa Diamonds (Pvt) Limited

New Dawn Mining

RioZim Limited

Samrec Vermiculite Zimbabwe (Pvt) Limited

Sandvik

SMC Drilling

Trojan Nickel Mine

University of Zimbabwe Geology Department

Unki Mines (Pvt) Limited

Vast Resources

Zimbabwe Geological Survey

Zimbabwe Mining Development Corporation

Zimbabwe Mining Investments

Zimbabwe Platinum Mines Limited