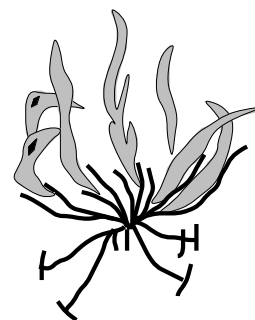

Geological Society of Zimbabwe



Newsletter



May 2006



Earth movements associated with the Mag 7.5 Earthquake on 22/2/2006

Faulted Save alluvium east of Massangena, Mozambique

With acknowledgements to Dr Roger Clark

Programme Manager MSc Exploration Geophysics

Leeds University

THE GEOLOGICAL SOCIETY OF ZIMBABWE, P.O. BOX CY 1719, CAUSEWAY, HARARE

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Editorial

Welcome to the first Newsletter under the 2006 Committee. We bring you a number of interesting articles, most with their origin from the time of the 2005 Summer Symposium. More topical, however, are the notes and facts relating to earthquake activity close to the south-east border of Zimbabwe along the Save Valley in Mozambique. Keep us in mind for our next edition in September, when we should have report back on various talks and field trips that are in the offing.

Those who wish to reach our Membership, please make use of our advertising space. This will be at the rate of \$2,000,000.00 per full page; \$1,000,000.00 per half page and at \$500,000.00 for a business card. These days you can't get cheaper than that, so support us.

Nyikadzino Matura and Tim Broderick



Chairman's Chat

H.N. Gumbo

I would like to take this opportunity to thank the 2005 Committee headed by Andrew du Toit for a job well done. It wasn't a case of simply keeping the Society going, but an introduction of new projects such as the atlas and geologists training. For the first time since its introduction a few years ago, the Summer Symposium was held outside Harare, in Bulawayo, followed by a well attended trip to Hwange. Thanks again for Tim Broderick's Macgregor Memorial Lecture, held both in Harare and Bulawayo. The AGM was well organised and attended.

This leaves this year's Committee with quite some homework. We hope to maintain the momentum with the assistance of the immediate past two chairpersons drafted into this year's Committee. Obviously without the members outstanding support in these difficult times, we can never make it.

Over and above the existing projects, this year we intend to embark on two new projects, which are facilitating publication of the 1: million Geology of Zimbabwe map and the UZ Lecture Fund.

The existing geological map of Zimbabwe was published in 1977, some 29 years ago! A lot of work funded by bilateral agreements, institutions and individuals has taken place and is yet to be incorporated into the map. There are some fundamental changes. In conjunction with the Geological Survey of Zimbabwe, the Society has appointed a subcommittee (Tim Broderick, Dennis Shoko and Gayle Hanssen) to get this project off the ground. They need all our support.

As you are all aware, the UZ Geology Department, at which most of us were trained, is very much understaffed due to the exodus of most lecturers for greener pastures. The Society will be making another attempt this year to mobilised industry support in cash or kind, not only to keep the remaining staff but to attract new members, either by participation from other UZ departments and/or industry in general. To achieve this, funds are needed to pay visiting lecturers, contribute to field trip expenses and the balance of raised funds could be used to top-up sitting staff. This will be an uphill task as most industry is under tremendous stress, but we have to give it a go.

Every effort is being made to produce a calendar of events. So far we have picked 1st December for the Summer Symposium to be held in Harare at a venue to be announced. An ambitious programme of six field trips and six talks is planned this year. The highlight of planned field trips will be one to Murowa sometime in July or August. Unfortunately, there is a limited number of participants allowed by the mine

for this one. The talk on the Snake's Head Platinum Project was done in March and Luckson Manda of Rockover Resources presented "An Environmental Scan of the Zimbabwe Mining Industry; Implications to Exploration and Mining Investment" at the School of Mines in Bulawayo on 2nd June 2006. It is our view that local events can be organised in different regions in order to enable easier attendance. So if any member has anything interesting to show they are most welcome.

Tim Broderick and Nyikadzino Matura are our newsletter editors. Please send us articles.

There has been some interest in the Society organising an international symposium. The Society will give this some consideration. Any suggestions are welcome.

The Society thrives on a good membership all round; ordinary, institutional, foreign and associate. The more of us who participate, the greater is our success! So if you have not paid your subs yet, please do so. For those in institutions, consultants, makorokoza, support the Society by placing your adverts in the newsletter for a small fee.

Thank you for your contribution in 2006.

Articles

A Summary of the 8th A.M. Macgregor Memorial Lecture, 2005

130 years of Regional Geological Mapping – Zimbabwe's Heritage and a Challenge for the Future

T.J. Broderick

Jeremy Prince & Associates, P.O. Box HG36, HIGHLANDS, Harare

From the archaeological record of Zimbabwe we acknowledge the keen observational ability of our Stone Age, San and Ancients in adapting their environment to their way of life. This resulted in their use of appropriate stone for tools, iron for hoes, clay for pots and gold and copper for trade and adornment. The observation of rock relationships and the development of stratigraphic principles came to a head only some 200 years ago and were recognized in the publication of William Smith's first geological map of Britain in 1815. It has been dubbed "The map that changed the World" and it is in the tradition of Smith that regional geological mapping in Zimbabwe and the World follows.

Although Thornton, geologist to Livingstone's Zambezi Expedition of 1858 to 1863, touched Zimbabwe at the Victoria Falls and at Kanyemba, it is the German explorer Carl Mauch who is recognized as the first geologist to traverse Zimbabwean territory. He walked the Bulye River Valley in 1868 before joining Henry Hartley in their quest for gold to the vicinity of the present-day Chegutu. He also recognized and documented the Tati Gold Belt. Mauch returned in 1871 when he crossed the Bempe (Limpopo) River, passed Marungudzi and crossed the waterless Nuanetsi lava field to reach Great Zimbabwe. He continued, to name the Kaiser Wilhelm Gold Belt at Makaha, before migrating east through Mozambique to Quelimane. He chronicled a wealth of geological, botanical and sociological detail, whilst his route was fixed by sextant, chronometer and aneroid barometer.

Organized regional geological mapping in southern Africa began with the Geological Commission of the Cape of Good Hope in 1895. Prof. Ernest Schwarz and Dr A.L. du Toit were on this Commission in 1904 when their masterful geological maps of the Langkloof and Eastern Cape were based on the survey of farm boundaries, but did not reflect the diverse topography they worked within. Schwarz advocated the damming of the Cunene and Chobe rivers and the diversion of waters to flood the Makarikari Pans. This engendered controversy and it was du Toit who was asked to mediate in the feasibility of the scheme. He, with the use of a South African DH9 aircraft,

initiated the use of aerial photography in the region by flying sorties out of Livingstone. The irrigation of Botswana was not achieved.

P.B. Fletcher was the first surveyor in Bulawayo. He was invited to plan and survey the streets in 1894 and these form the basis of the CBD and Suburbs today. More importantly, this survey work caused Fletcher to invite his elder brother, R.A. Fletcher and friend W.M. Espin to join him from Johannesburg. They published the first geological map of Matabeleland in 1897, a remarkable feat when the geodetic and primary triangulation of Rhodesia was only initiated in that year. Alexander Simms completed the survey up the 30-degree Arc of Meridian between Bulawayo and Salisbury by 1901, whilst Rubin continued this northwards across the Zambezi. Gordon then linked the chain from the Transvaal in 1906. Further triangulation in the country then remained dormant until 1928.

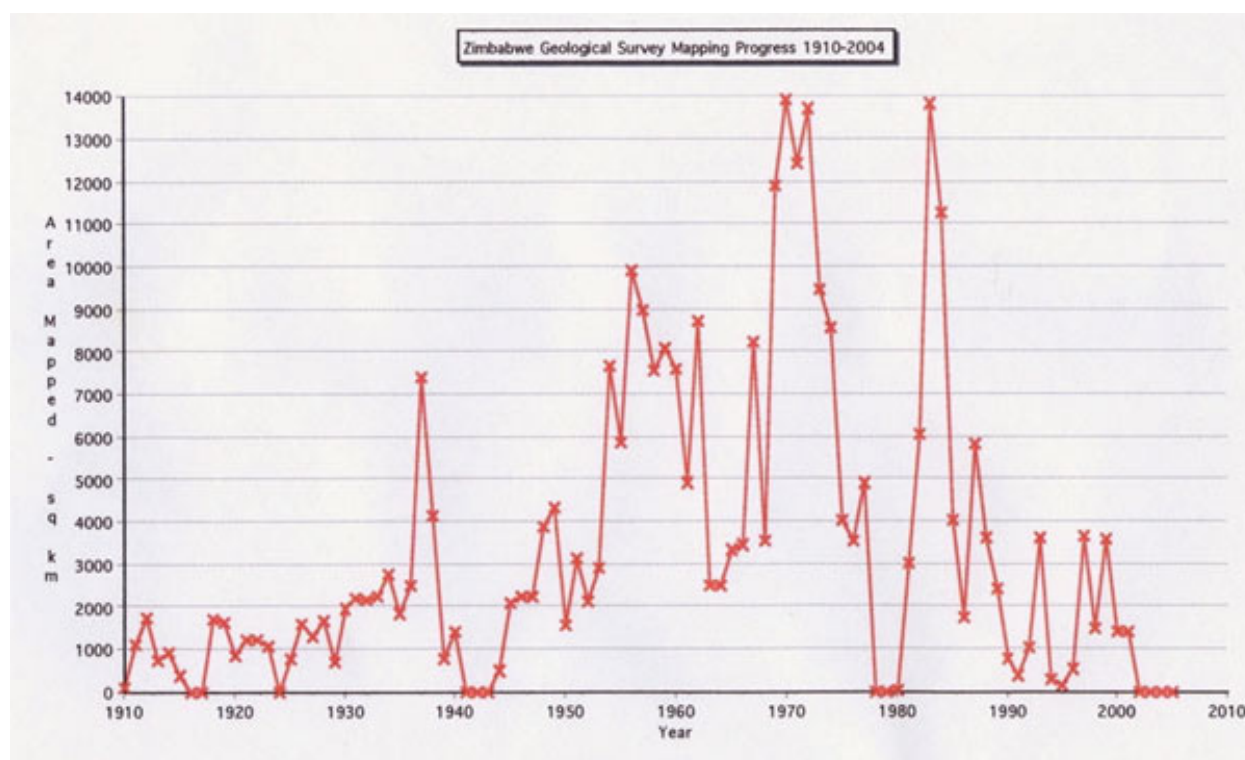
A.J.C. Molyneux was one of the earliest geologists and mining engineers active in the region. He, through the Chamber of Mines, was instrumental in founding both the Rhodesia Scientific Association (1899) and the Rhodesia Museum (1901) in Bulawayo. Chamber of Mines' support for a national museum required that the curator be a geologist. This was Frederick Mennell, whose service to mining and geology in the country earned him the title of being Zimbabwe's 'father of geology'. By 1904 he had accumulated sufficient knowledge on the geology to publish his own map. Mennell was to be one of the main protagonists, again through the Chamber of Mines and the BSA Company, for the establishment of a national Geological Survey, which came to fruition in 1910 with the appointment of H.B. Maufe as its first Director in Bulawayo. He immediately set to work to map the geology of the Enterprise Gold Belt with the aid of mule-drawn buckboard and plane table. He was to serve this country handsomely until his retirement in 1934 and again during WW II.

The first published Geological Survey map was of the Selukwe mining camp, representing the concerted efforts of Maufe, Ben Lightfoot and A.E.V. Zealley through 1911 and 1912 in what we now know to be an area of extreme geological complexity and difficult topography. Zealley had succeeded Mennell as Curator at the Museum before joining the Geological Survey whilst Lightfoot had followed Maufe from the British Geological Survey's Scottish Office. He was experienced in coal geology and went on to assess and map the Great Sabi Coal Syndicate claims and the Wankie Coal Concession in 1912. The mapping was at a scale of 800 Cape Roods to the inch. A.M. Macgregor, who had been Assistant Curator at the Museum, joined the Survey in 1914 and assisted Maufe in mapping Kalahari and Karoo stratigraphy west of Queens Mine. He returned after war service in 1919 to complete Zealley's mapping of the Somabula diamond field before returning to the Bembezi Valley to complete the geological mapping around the Lonely Mine in 1922. He was to complete a 27-year marathon of geological field work, which only terminated on his appointment as Director of the Geological Survey in 1946. He concentrated his efforts on the Basement Complex and he worked his way south from Kadoma through Battlefields and Kwekwe to Hunters Road, the latter being the first geological map at a scale of 1 : 100 000 and the work resulted in his famous tripartite subdivision of greenstone belt stratigraphy into the Sebakwian, Bulawayan and Shamvaian. As the author of over 50 geological publications, Macgregor's Doctor of Philosophy degree was awarded by the University of Natal in 1947. He was the Geological Society of South Africa Draper Memorial Medallist in the same year, was awarded the OBE in 1949 and became the Society President in 1951.

The first 1 : 1 million-scale geological map of Southern Rhodesia was published in 1921 and then again in 1928 to coincide with the 1929 World Geological Conference held in Pretoria. Accelerated progress of geological mapping was facilitated by the introduction of motorized transport in 1925 and the inauguration of aerial photography in 1935, when A.E. Phaup and F.O.S. Dobell were mapping the Lower Umfuli Valley. Maturity of the 1 : 1 million map continued to show itself through the 1936, 1946 and 1961 editions, the latter being the first to be scribed as opposed to being purely hand drawn. The 1970's saw an upsurge in the number of geologists employed in regional geological mapping, their efforts culminating in publication of the 1971 1 : 1 million map, designed to coincide with the Geological Society's international Granite '71 Conference. The passion for regional mapping was at its height under the directorship of Wiles and Stagman and the 1977 version of the million-map reflected this advance. The map and its accompanying bulletin remain definitive in the perspective of the Geological Survey of Zimbabwe as it has now been reprinted four times, although interpretive changes have been made in the publication of the 1 : 1 million-scale Tectonic map of Zimbabwe, an initiative that resulted from the British Geological Survey project on structural controls of gold mineralization in the country, but included the minds and research of others, notably Phillip Oesterlen, Tom Blenkinsop and Jim Wilson.

The Geological Survey now has access to digital mapping techniques and a modern linework camera. Extensive areas of new geological mapping have resulted from renewed efforts during the 1980's and 1990's and this has allowed for the compilation of a new national geological map. This is a landmark map that sorely requires to be published in the national interest, as information dissemination is essential for development planning and implementation, especially in this, our time of need. The challenge is there. If a map could change the course of geological thinking and a nation's, or indeed the World's fortunes in 1815, a similar one could certainly help Zimbabwe now. And, if Macgregor is anything to go by, there is a need for the passion and determination that he

showed to pull this project off and to revive the pressing need for the continuation of basic and routine mapping and documentation of our geological resource.



Potential Exploitation of Great Dyke Eluvial Chromite

Caston T. Musa

Zimbabwe Alloys limited

Apart from the concentrations of chromite in layers within the Great Dyke and other ultramafic complexes, chromite also occurs as interstitial grains throughout the olivine-bearing rock-types. These olivine-bearing rocks include norite, gabbro, dunite and pyroxenite. Chromite concentration (% Cr_2O_3) in these rocks varies from 0.48 to 3.09 per cent of the rock (Ahrens, 1965; Worst, 1960). A small portion of this chromite settled to form chromitite seams whilst the remainder is retained within the rock mass as finely disseminated chromite and chromite interstitial to olivine. This retained chromite is much finer grained than seam chromite and is the primary source of eluvial chromite (Cotterill, 1981). During weathering of the serpentine rock and transportation by rainwater, the heavier chromite and magnetite grains are re-deposited along watercourses and in vleis or valleys as the speed of the water is retarded sufficiently for the heavier particles to settle. The lighter serpentine material is removed and the chromite concentration in the soil is increased, thus resulting in eluvial chromite (Keech et al, 1961; Worst, 1960; Prendergast, 1978). This concentration of chromite in soil can be up to 15 or more % Cr_2O_3 concentration resulting in economically exploitable deposits particularly along the Great Dyke flanks. A preliminary evaluation indicates that the Great Dyke could be host to over 10 million tonnes of potential chromite, which could be processed from such eluvial concentrates. These chrome-rich soils can be mined more cheaply than the traditional seams and processed into chromite concentrates through simple mechanical techniques using spirals and Nelson concentrators. The resultant chromite concentrates are of high quality and can be used to produce briquettes, which are alternative to lumpy chromite feed for smelters. Challenges to eluvial mining include environmental concerns and the widespread distribution of these deposits, necessitating mobile plants and extensive infrastructure requirements. These challenges are not insurmountable as test mining and previous production runs have proved profitable.

Development of a Groundwater Flow and Contaminant Transport Model for Unlined Tailings Dumps

S. Ravengai, R. Owen, D. Love and M. Meck
University of Zimbabwe

Mining and mineral processing has a long history in Zimbabwe. Modern mining operations are bound by current environmental legislation, which is becoming more stringent in most countries. However, many places in Zimbabwe have a legacy of old mines and dumps that were not subjected to the same level of environmental legislation, because such legislation did not exist at the time. The production processes employed during mineral processing have necessitated the disposal of a variety of waste materials (tailings) and industrial effluent to tailings dams located around the mine site. Most of the older tailings dumps in Zimbabwe are unlined and were originally operated under poor management practice. Several studies carried out around old mine dumps in Zimbabwe show that the unlined tailings dumps develop pollution plumes beneath that affect the groundwater resources. The studies also show that even if these old dumps no longer actively receive waste, they continue to discharge chemical pollution into the ground.

A preliminary groundwater flow and contaminant transport model has been constructed using VISUAL MODFLOW for a site in northern Zimbabwe. The model shows that groundwater flow from the dump site discharges into the headwaters of a nearby river, and that over each model period of 10 years, an average volume in of some 5,000,000 m³ of groundwater is discharged into the stream that drains the site. Since the groundwater samples show significant chemical contamination, it is certain that some of this discharge carries pollutants into the wider environment.

The contaminant transport model shows that pollution plumes have developed that are associated with the unlined tailings dams, and that these plumes have flowed towards and into the river. The model shows that, although the closing of the unlined waste dumps has helped the situation by reducing the fluid effluent discharged onto these dumps, these dumps still contain materials that continue to react with the infiltrating natural groundwater recharge and thus continue to contaminate the aquifer, albeit at a reduced rate. The volumes of contaminant may be calculated from the model.

The model can be used to develop scenarios for the future of a dump site and to predict the duration and extent of pollution under different effluent management practices.

News



Geology Department, University of Zimbabwe

Nyikadzino Matura

The 2005-2006 academic year is coming to an end in June 2006. The Department of Geology successfully managed to run all its undergraduate courses, including the honours courses. 25 students are expected to proceed to second year, 20 to third year and 18 should graduate in August this year. Before the students in the current third year class graduate, they are supposed to embark on their last fieldtrip to the Belingwe Greenstone Belt and the second years are to go to Gokwe. The combined trips will require approximately

1500 litres of diesel to be successful. Any donations of fuel or lunches for the students will be greatly appreciated from the mining companies, who will be the future beneficiaries of this training exercise.

The 4th year honours students are almost through with their lectures and will be sitting for their examinations in June 2006. As soon as they complete their exams, they will be looking for honours places to carry out their main projects. We call upon the industry to assist them with areas to map, places to stay and food to eat during that period, which is normally of six weeks duration.

The Department is happy to note that its graduands are highly sort after by the mining industry. We wish to call upon the industry to take a keen interest in the training of students by supporting all the activities of the Department from fieldtrips to the offering of scholarships to individual students. This will go a long way to ensure that you get the best end product.

The Geological Survey of Zimbabwe

F.B. Mupaya

The Director and other Ministry heads attended the mining investment forum (Indaba) in Cape Town. Mr Hawadi then attended the Prospectors and Developers Association of Canada (PADC) meeting with the Secretary for Mines and Mining Development. These workshops provided opportunities to learn modern investment strategies applied by other countries.

The Department has maintained its duties by providing assistance mostly to small-scale miners, albeit under difficult conditions. The mapping section remains closed, although activities to speed up publication of the 8th edition of the 1 : 1 million geological map have been revived. Exclusive Prospecting Order applications and the Special Grant database were kept up to date, although the current apparent freeze on the granting of EPO's is a cause for concern.

The Department welcomes the return of Mr Mugumbate, who has been on secondment to Shabanie and Mashava Mines for the past year and a half. His services will definitely speed up publication of some of our articles. Early this year, the Department lost the services of Principal Geologist, Mr Sofelani Mangezi; Senior Geologist, Ms Rejoice Mjanja and Principal Cartographic Technician, Mr Westbury Nyahasha, who left for greener pastures. However, the Public Service Commission has allowed the Ministry to recruit new staff. Interviews were conducted in April and three new geologists have started work. These new geologists will each be encouraged to pursue their BSc Honours Degree so as to maintain Departmental standards. Currently, Ms Constance Kirenga is doing her BSc Honours course at the University of Zimbabwe. It is hoped that that programme is not interrupted again so that more geologists are trained to serve the industry.

Recent Earthquake Activity

Notes by N. Matura and T. Broderick

Earthquakes have become a common phenomenon to Mozambique and Zimbabwe of late. Although tremors from earthquakes are not uncommon, this year their magnitude and frequency seem to be more apparent than usual. The most intriguing thing is that nobody ever imagined that an earthquake of the magnitude of 4.3 on the Richter Scale could be centred near Dorowa, well within the craton, an area regarded as being highly stable. However, considering that 74 of the quakes measuring magnitude 3.0 or greater have occurred since the February 22nd 7.5 magnitude shake and are concentrated in the Save Valley just east of the Save-Runde junction inside Mozambique, it is highly likely that some dormant faults within the craton should be reactivated. This reactivation may have led to the latest double earthquake, which were centred just 8 km north of Shawa, close to the NNW Save lineament leading up to Wedza Mountain.

In fact, significant earthquake activity has always been a feature of Manica Province close to the Zimbabwe border. The earliest record we have is a quake of intensity V with its epicentre at -18.9S, 32.6E near Mutare on 20th October 1915 at 18.49.00. Other tremors have been a feature around Espungabera, east of Chimanimani and north of Mutare at regular intervals since then but the most consistent series took place between March and August 1951.

YEAR	MO	DA	ORIG TIME	LAT	LONG	INTENSITY	MAG	LOCATION
1940	10	20	03.39.33	-17.0	33.0	VI		East of Nyamapanda
1944	08	17	04.30.00	-20.5	32.8	V		Near Espungabera
1946	04	18	11.27.16	-22.5	33.0			South of Masengena
1951	04	03	06.43.20	-20.0	34.0	VII	5.8	Near Buzi Bridge
1951	05	10	09.18.13	-19.9	33.8	VII-VIII	6.6	Near Dombe
1951	05	10	12.05.00	-20.5	32.8	III		Near Espungabera
1951	05	12	03.03.53	-20.0	34.0	VII	5.3	Near Buzi Bridge
1951	05	14	21.45.00	-20.5	32.8	III		Near Espungabera
1951	05	20	03.25.00	-20.5	32.8	III		Near Espungabera
1951	05	20	12.04.49	-19.9	33.8	IX	6.4	Near Dombe
1951	05	20	12.11.00	-20.5	32.8	III		Near Espungabera
1951	05	20	14.05.00	-20.5	32.8	III		Near Espungabera
1951	06	09	19.17.00	-20.5	32.8	III		Near Espungabera
1951	08	01	10.52.54	-19.2	34.0	VIII	5.9	Nchope
1951	08	26	03.15.00	-20.5	32.8	IV		Near Espungabera

***Bulawayo Chronicle* 11/5/1951 Tremors (Few seconds to 3-minute spells) felt in Rhodesia. Umtali buildings crack in two disturbances. Window panes shaken out.**

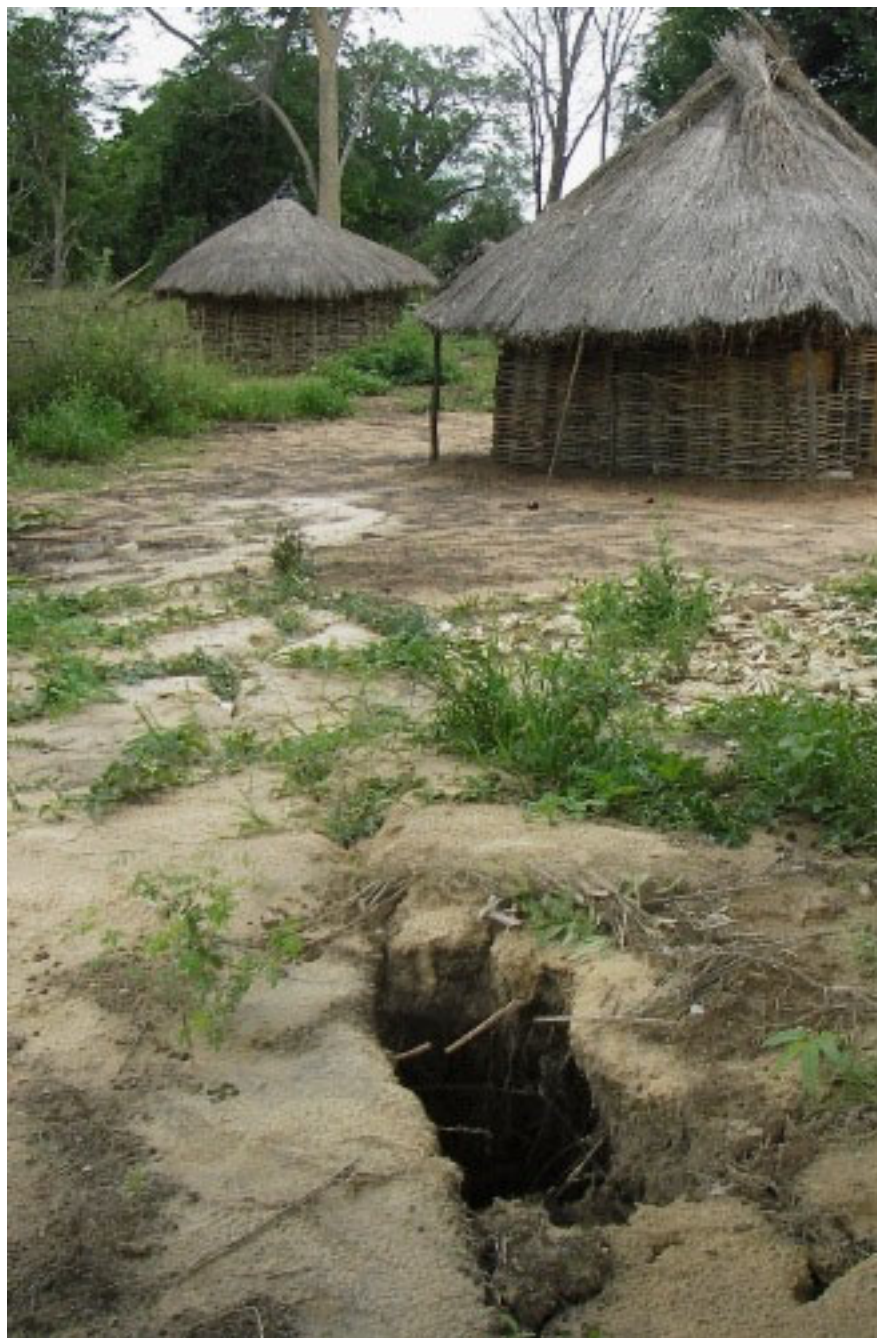
At Umtali at 11.15am yesterday crowds rushed out into the streets when buildings trembled and cracked and windows vibrated as the second earth tremor within two months shook the whole town for almost a minute. Reports show that the tremor was felt all over the Eastern Districts from Chipinga to Inyanga, and at Beira as well. Nineteen minutes later another tremor, lasting only a few seconds, was felt. At Chipinga the quake was preceded by heavy rain. No severe damage or injury to people was reported, although in Salisbury buildings shook, and people described the noise as being like a 'heavy convoy passing through a street.' Patients in a ward at the Bulawayo General Hospital said their beds shook at 11.23 am. Mrs O.F.T. Melville, who lives in Percy Avenue, Hillside, said that the tremor caused plaster to fall from the wall of her house. Two people at Milton School saw water slopping about in a glass jug. At Fort Rixon

windows of the Police Station were damaged. At Wanderer Mine it was felt at 11.20 am. Windows and doors rattled, pictures shook and furniture moved. No damage was done underground. The tremor was felt in Selukwe, but in Gwelo it was very slight and generally unnoticed. One household heard unaccountable jingling of utensils in the kitchen.

Sunday News 12/5/1951 Umtali shaken by seven tremors in 3 days. Smoke spouts from kopje. Mr G. Cavadias, an Umtali tobacco farmer, was called out of his house to see smoke rising rapidly from what appeared to be a crack in the side of a kopje, several miles from the town. He watched it for about 5 minutes before it disappeared. Skeptics believe the 'smoke' to have been a cloud of dust raised by falling rock dislodged during the vibrations. At Laughing Waters near Chipinga the walls of a farmhouse were cracked. At Melsetter the Government Office started rocking and cracks appeared in the walls. Eric Dawson, the Native Commissioner, received a report that a mountain had fallen down. On investigation, and after walking over several ranges, he found that a large area, about 500 yards across, had broken away and crashed to the bottom of a gorge, destroying everything in its path.

Here's what Peter Lowenstein up in the Bvumba wrote about the February 2006 event:

Just to make life even more interesting - good old "Gods Country" [Mozambique] over the border - produced a Richter Magnitude 7.5 earthquake on 22 February and sent MMI 5 - 6 ground motion lasting two minutes 300 km from the Save Game Park to give us a damn good shaking at 00.23 hours (local time) in the morning. It was quite frightening especially in the upstairs bedroom in my brick-under-tile house in almost total darkness as the ZESA power had gone off earlier that night! The house really moved and the noise produced by the structure creaking and furniture shifting around was very alarming - and for a few seconds I thought the place might really collapse. Surprisingly little damage was done - because the epicentre was so far away but lots of cracks in walls and along the ceiling was covered with black marks where dust from the loft came in. My earthquake alarm picked up the ground motion even before it started to be felt and sounded continuously for over ten minutes. Small aftershocks could be felt every few minutes for the next hour and have been coming in ever since at increasing intervals. We are still getting one every couple of days and last Wednesday we had two felt ones about MMI 2-3, which lasted about a minute each. How could anyone have anticipated that the earthquake alarm I built in Papua New Guinea to monitor the Rabaul Volcano would ever come in for so much use here - apart from picking up the footsteps of intruders outside the workshop? It has enabled me to keep an almost complete log of the arrival times and duration of most of the aftershocks.



Details on some of the recent earthquake activity that has effected Zimbabwe and Mozambique since February 2006

Magnitude 4.6 MOZAMBIQUE

Date-Time Monday, May 15, 2006 at 13:56:13 (UTC) - Coordinated Universal Time
Monday, May 15, 2006 at 03:56:13 pm local time at epicentre

Location 21.36S 33.37E

Depth 10 kilometers

Region MOZAMBIQUE

Reference230 km (145 miles) SW of **Beira, Mozambique**250 km (155 miles) S of **Chimoio, Mozambique**515 km (320 miles) N of **MAPUTO, Mozambique**975 km (600 miles) NNE of **Durban, South Africa****Location Quality**

Error estimate: horizontal +/- 21.9 km; depth +/- 0.0 km

Location Quality**Parameters**

Nst=18, Nph=18, Dmin=867.8 km, Rmss=1.52 sec, Erho=21.9 km, Erzz=0.0 km, Gp=138.6 degrees

Source USGS NEIC (WDCS-D)**Magnitude 4.3 (Light) ZIMBABWE****Date-Time** Sunday, May 21, 2006 at 21:55:03 (UTC) – Coordinated Universal Time

Sunday, May 21, 2006 at 11:55:03 pm local time at epicenter

Location 19.133S, 31.688E**Depth** 10 km (6.52 miles) set by location program**Region** ZIMBABWE

Distances 105 km (65 miles) W of Mutare, Zimbabwe
 140 km (85 miles) NE of Masvingo, Zimbabwe
 160 km (100 miles) SSE of Harare, Zimbabwe
 2055 km SSW of Nairobi, Kenya

Location Uncertainty Horizontal \pm 20 km (12.4 miles); Depth – fixed by location program**Parameters** Nst = 7, Dmin = 565.7 km, Rmss = 0.82 sec, Gp = 173o, M-type = body magnitude (Mb),**Version** = 6**Source** USGS NEIC (WDCS_D)**NEIC: USGS EARTHQUAKE DATA BASE**

For 2006, magnitude 3.00 and above

Latitude: 19.000S - 22.000S**Longitude:** 31.000E - 35.000E**Catalog Used:** PDE**UCT** = Co-ordinated Universal Time**Events** = 77**CAT YEAR MO DA ORIG TIME LAT LONG DEPTH MAGNITUDE**

PDE-W	2006	02	21	191042.49	-21.32	33.30	10	4.40
PDE-W	2006	02	22	221907.80	-21.32	33.58	11	7.50
PDE-W	2006	02	22	222652.65	-21.21	33.31	10	5.40
PDE-W	2006	02	22	222902.86	-21.33	33.49	10	4.90
PDE-W	2006	02	22	223644.10	-21.35	33.48	10	4.80
PDE-W	2006	02	22	230506.67	-21.39	33.27	10	4.60
PDE-W	2006	02	22	232639.02	-21.44	33.21	10	4.80
PDE-W	2006	02	22	234450.78	-21.29	33.46	10	4.70
PDE-W	2006	02	22	234937.78	-21.28	33.40	10	3.80
PDE-W	2006	02	23	054509.82	-21.32	32.96	10	4.40
PDE-W	2006	02	23	055249.39	-21.15	32.71	10	3.90
PDE-W	2006	02	23	082559.09	-21.44	32.59	10	4.70
PDE-W	2006	02	23	010629.63	-21.36	33.33	10	3.80
PDE-W	2006	02	23	011753.26	-21.68	33.44	10	5.00
PDE-W	2006	02	23	012342.20	-21.37	33.53	10	5.80

PDE-W	2006	02	23	022124.24	-21.41	33.09	10	
PDE-W	2006	02	23	022207.71	-21.42	33.49	10	5.30
PDE-W	2006	02	23	023938.58	-21.36	33.35	10	4.10
PDE-W	2006	02	23	024054.53	-21.40	33.42	10	4.30
PDE-W	2006	02	23	024556.70	-21.17	33.24	10	4.40
PDE-W	2006	02	23	035125.11	-21.53	33.27	10	4.10
PDE-W	2006	02	23	071938.04	-21.14	33.30	10	
PDE-W	2006	02	23	085155.28	-21.29	33.00	10	4.30
PDE-W	2006	02	23	101334.43	-21.34	33.18	10	3.10
PDE-W	2006	02	23	111545.79	-21.09	33.23	10	4.20
PDE-W	2006	02	23	172234.11	-21.35	33.12	10	4.40
PDE-W	2006	02	23	201722.70	-21.48	33.17	10	4.20
PDE-W	2006	02	23	213205.62	-21.31	33.54	10	5.00
PDE-W	2006	02	24	005255.68	-21.16	32.78	10	4.30
PDE-W	2006	02	24	014833.18	-21.36	33.20	10	4.50
PDE-W	2006	02	24	111013.88	-21.06	33.21	10	4.00
PDE-W	2006	02	24	213430.17	-21.33	33.28	10	4.20
PDE-W	2006	02	24	232440.04	-21.22	33.65	10	4.80
PDE-W	2006	02	25	013024.65	-21.25	33.31	10	4.40
PDE-W	2006	02	26	035326.71	-21.22	32.97	10	4.30
PDE-W	2006	02	26	135203.27	-21.23	33.20	10	4.50
PDE-W	2006	02	26	143544.95	-21.36	33.23	10	
PDE-W	2006	02	26	235851.32	-21.33	33.20	10	4.20
PDE-W	2006	02	27	030029.54	-21.46	33.20	10	
PDE-W	2006	02	27	054013.89	-21.17	33.18	10	4.00
PDE-W	2006	02	28	004204.92	-21.21	33.23	10	4.90
PDE-W	2006	02	28	035735.21	-21.52	33.49	10	4.60
PDE-W	2006	03	01	031603.59	-21.05	33.12	10	4.40
PDE-W	2006	03	05	015823.79	-21.40	33.26	10	4.40
PDE-W	2006	03	05	020834.87	-21.44	33.29	10	4.60
PDE-W	2006	03	05	021220.91	-21.40	33.46	10	4.50
PDE-W	2006	03	06	012947.13	-21.28	33.18	10	4.60
PDE-W	2006	03	06	112357.32	-21.27	33.21	10	4.40
PDE-W	2006	03	07	035844.11	-21.15	33.03	10	
PDE-W	2006	03	08	000526.29	-21.42	33.07	10	4.60
PDE-W	2006	03	08	151753.90	-21.08	33.22	10	4.40
PDE-W	2006	03	09	060710.07	-21.16	32.95	10	4.20
PDE-W	2006	03	11	232107.72	-21.29	33.07	10	
PDE-W	2006	03	12	011229.32	-21.41	32.67	10	4.70
PDE-W	2006	03	14	072529.16	-21.24	33.24	10	4.80
PDE-W	2006	03	14	073714.46	-21.44	33.56	10	4.40
PDE-W	2006	03	15	115254.07	-21.19	33.53	10	5.30
PDE-W	2006	03	15	141948.69	-21.14	33.72	10	5.60
PDE-W	2006	03	15	180859.87	-20.93	32.88	10	4.40
PDE-W	2006	03	16	080033.80	-21.38	33.06	10	4.30
PDE-W	2006	03	17	072907.30	-21.48	33.31	10	4.80
PDE-W	2006	03	18	131042.83	-21.33	33.12	10	4.50
PDE-W	2006	03	19	162342.87	-21.72	33.56	12	4.90
PDE-W	2006	03	19	162408.88	-21.02	33.55	10	4.60
PDE-W	2006	03	19	162644.38	-21.13	33.37	13	4.20
PDE-W	2006	03	22	113513.05	-21.34	33.26	10	5.10
PDE-W	2006	03	23	061441.51	-21.24	33.46	10	5.00
PDE-W	2006	03	25	101911.29	-21.05	33.13	10	4.50
PDE-W	2006	03	26	102139.12	-21.31	33.25	10	4.20
PDE-W	2006	03	27	145625.39	-21.36	33.37	10	4.50
PDE-W	2006	04	04	021327.75	-21.26	33.33	10	4.60
PDE-Q	2006	04	14	184139.49	-21.41	33.65	26	5.30
PDE-Q	2006	04	15	080145.49	-21.08	32.94	10	4.70
PDE-Q	2006	04	15	164419	-21.05	33.06	10	4.50
PDE-Q	2006	05	12	181218.92	-21.23	33.15	20	4.80
PDE-Q	2006	05	15	135613.34	-21.37	33.38	10	4.60
	2006	05	21	215503	-19.13	31.69	10	4.30

Research Funding Opportunities



GSZ Research and Development Fund

N. Matura

The objective of the Research and Development Fund is to give financial assistance for the development of earth science research and training in Zimbabwe. This financial assistance shall be in the form of annual Grants. Grants shall be made for activities over the course of up to one year. Those wishing to continue beyond one year must make subsequent and separate applications. The purpose of the Fund is to support:-

- Research projects on earth science topics of interest (Note that grants from the Fund will not be made to support projects which result in results that are not available to all members of the geological community in Zimbabwe);
- Scholarships for postgraduate study in earth sciences;
- Field trips and short courses for the training of Zimbabweans in earth sciences; and
- Travel to conferences to present earth science results.

In recommending the award of Grants, the following shall be considered:-

- The objective and purpose of the Fund;
- Potential benefits of the proposed activity to the geological and mining communities in Zimbabwe, in terms of development and/or the generation of new knowledge;
- The availability of matching funds, source or provided by the applicants; and
- The aim of awarding more than one Grant in a given year.

Grants made from the Fund shall be on condition that:-

- Results from the supported activity will be presented to the Society via a talk and an item or items in the Newsletter;
- Submission to the Fund Subcommittee of an annual report by 31 December of the year in which funding is granted; and
- Submission of a financial report to the Fund Subcommittee, with copies of receipts, by 31 December of the year in which funding is granted

All applicants for the award of Grants from the Fund shall be Members in good standing for the current membership year. Normally, the principal applicant should have been a member in good standing for at least twelve months.

Applicants for Grants should submit to the Research and Development Fund Subcommittee an application containing details of the applicants, summary of the activity, justification of the activity, proposed methodology, timeframe, budget for application and details of matching funds, if any. If you would like to apply for support, please contact the Research and Development Fund Subcommittee Secretary, N. Matura (nematura@science.uz.ac.zw) Applications for this year should be made by 30 July 2006.



SEG Timothy Nutt Memorial Fund

Brian Thomson and David Love

A fund in memory of Timothy Nutt has been established by the SEG Foundation at the request of his family and close friends. Tim was a prominent consulting economic geologist, a SEG Member and contributor to the Exploration Reviews pages of the SEG Newsletter. He worked extensively throughout Africa and had strong professional and emotional ties to the country of Zimbabwe. He was attacked and killed on April 12, 2003, while carrying out exploration work in Eritrea. He was 49.

In accordance with the wishes of Tim's widow, Jacquie, the fund is to provide financial support for students and young economic geologists located in Zimbabwe or in southern Africa with ties to Zimbabwe. The fund may be used to support travel to technical meetings, field trips, research grants, technical lectures, SEG student chapter activities or any other activities approved by the SEG Regional Vice President for Africa. SEG members resident in Zimbabwe will aid the Vice President in selecting recipients.

The Fund is now soliciting applications. If you would like to apply for support, please contact either Brian Thomson (brt@mweb.co.zw) or David Love (davidlove@science.uz.ac.zw). Applications for this year should be made by 30 July 2006.

Come Join Us for These Exciting Events!

Forthcoming Field Trips

VENUE	DATE	CONTACT
Belingwe Greenstone Belt	10-17 June	Nyikadzino Matura, UZ Geology Department. Tel.: (04) 303211 ext. 1427 or 011-871863. Fax.: (04) 303557. Email.: nematura@science.uz.ac.zw

GEOLOGICAL SOCIETY OF ZIMBABWE HONORARY MEMBERS

PROFESSOR J.F. WILSON

Jim Wilson came to this country in 1953, the year he graduated from Edinburgh University, to join the Geological Survey Department. His bulletins on the regional geological mapping around Masvingo and Mashava are well known, as are his 35 research papers authored during his association with the Geology Department at the University of Zimbabwe between 1967 and 1996, when he retired as Professor Emeritus of Geology. His untiring research on the granite-greenstone terranes of Zimbabwe earned Jim his DSc degree from Edinburgh in 1981. As a member of the Geological Society, Jim was on the organizing committee of the successful Granite '71 Symposium and has invariably presented papers at subsequent Society conferences. He became the inaugural speaker for the Macgregor Memorial Lecture in 1985 when he read "A Craton and its Cracks" and he has twice been awarded the Society's A.E. Phaup Award for papers of significance to Zimbabwe geology in 1979 and 1986. The proceedings of the 1997 conference on "Intraplate Magmatism and Tectonics of southern Africa" were named in Jim's honour.

DR A.C. COLVINE

Dr Sandy Colvine presented the second Macgregor Memorial Lecture in 1987 and was invited to present a concurrent workshop to members on “Genetic models in gold exploration”. His leadership in the geology of gold was further emphasised by publication of Ontario Geological Survey’s 1988 Miscellaneous Paper No. 139, “Archaean lode gold deposits in Ontario”.

MR E.R. MORRISON (d)

Euen Morrison had long been involved with the Geological Society in Zimbabwe. He was closely connected to the organising committee of the Granite ‘71 Symposium and chaired the Zimbabwe-Rhodesia Branch of the Geological Society of South Africa in 1979-80, becoming a founder member of our Society in 1981, and was again Chairman in 1990-91. He presented the inaugural lecture to the Coal ‘84 Workshop. Having graduated from the universities of the Witwatersrand and McGill, Euen worked in exploration in both Canada and southern Africa up until the time he joined the Geological Survey in 1967. He became Economic Geologist in 1969, publishing on Exclusive Prospecting Orders and mineral commodities, before becoming Deputy Director and then Director in 1978. He served in the latter post for almost 12 years until retirement in 1989, having achieved the virtual reconstruction of the Geological Survey in terms of its functions and the attraction of numerous projects funded by international aid. He died in Harare on 26th September, 2003.

DR L.A. LISTER

Linley Lister lectured in the Geology Department at our University for 34 years from 1963 to her retirement at the end of 1996. During this time her teaching affected every student to have passed through the Geology Department since its inauguration. One of her greatest contributions to the Geological Society was her editorship of the Granite ‘71 Symposium volume. Linley gained her PhD in 1976 and was awarded the A.E. Phaup Award for 1987 following publication of Zimbabwe Geological Survey Bulletin No 90, “The Erosion Surfaces of Zimbabwe”.

PROFESSOR K. ERIKSSON

Ken Eriksson was the 3rd A.M. Macgregor Memorial lecturer in 1992. His title was “Crustal growth, surface processes and atmospheric evolution of the early Earth”.

PROFESSOR R.G. PARK

As the 4th A.M. Macgregor Memorial lecturer for 1994, Professor Park spoke on “Early Proterozoic plate tectonics - an analogue for the Archaean?”

PROFESSOR E.G. NISBET

Euan Nisbet has long been associated with Zimbabwe, its geology, its people and its politics. He is one of the “Belingwe Group” with which his research work has been prolific, culminating in the 1993 issue of Geological Society of Zimbabwe’s Special Publication No. 2, “The Geology of the Belingwe Greenstone Belt”, which he edited with Mike Bickle. Euan gained his PhD degree from Cambridge University in 1974. Lecturing at Cambridge he then became Professor in Geology at the University of Saskatchewan and is presently Professor at Royal Holloway, University of London. Euan has been external examiner to the Geology Department at the University of Zimbabwe and was appointed a Life Member of the Zimbabwe Scientific Association in 1991. He has written or been part author of some nine books and in excess of 100 scientific papers, many of them relating to Zimbabwe. He is a winner of the A.E. Phaup Award for papers published on Zimbabwe geology in 1980 and 1993, and in 1998 he was invited to present the 5th Macgregor Memorial lecture entitled “The influence of life on the face of the Earth”. He is a tribute to Mount Pleasant High School.

PROFESSOR MAARTEN DE WIT

Maarten had worked for eleven years with Louis Nicholaysen at the Bernard Price Institute for Geophysics at the University of the Witwatersrand when he was invited to take the Chair at Cape Town. However, he stepped down in 1991. In 1993 he achieved the great distinction of being awarded an honorary Doctor of Science at Queens University, Ontario. He had been specifically involved with the geology of the Barberton Greenstone Belt. At Cape Town he attracted major funding from industry for the establishment of a laboratory specialising in computer graphics, a field with which he was familiar

from his long involvement with Gondwana reconstruction. He had always shown a special interest in the geology of Zimbabwe and he was invited to present the 6th Macgregor Memorial Lecture in 2000. This was entitled "Old rocks act lies: that's why it is so difficult to reconstruct what Earth looked like long ago".

DR K.A. VIEWING

Keith Viewing obtained his BSc (Hons) Degree from Durham University in 1952, following which he joined Rhodesian Selection Trust on the Zambian Copperbelt. In 1960 he read for his doctorate at the Royal School of Mines at Imperial College, from where he undertook 1300 km² of applied geochemical survey in central Sierra Leone. He returned to RST in this country in 1963 and joined the Ministry of Mines in 1967. In 1969 he was invited to head the new Institute of Mining Research at the University of Zimbabwe, gaining the Chair in 1974 and continuing to guide its fortunes until 1989. From 1989 to 1993, Keith was Consulting Geologist to the Anglo American Corporation in Zimbabwe before he retired to run his own consultancy. Keith Viewing has been closely associated with both the Institute of Mining and Metallurgy (Zimbabwe Section) and our own Society since the 1960's and was a Founder Member of the Geological Society of Zimbabwe in 1981. In recognising Dr Viewing's consistent support of the Society, Honorary Membership was conferred on him at the close of the 2002 Summer School.

PROFESSOR D.L. JONES

Dai Jones was accorded Honorary Membership of the Society on his retirement as Head of the Physics Department and at the Society's AGM in February 2003. He had been an integral part of the team, which established the Department as a leader in geophysics in the 1960's and he became particularly renowned for his research into and publications on palaeomagnetism. Dai has always supported the earth sciences, and he has served our own Society committee, and that of the Zimbabwe Scientific Association with distinction. His citation was read by his departmental colleague, Professor Teddy Zengeni, the Dean of Science. Dr Jones now teaches physics at St John's College in Harare.

PROFESSOR JAN KRAMERS

Jan Kramers had worked with Dr Hugh Allsopp in geochronology and isotope geophysics at the Bernard Price Institute for Geophysics at the University of the Witwatersrand before joining the Geology Department at the University of Zimbabwe. From 1980, the essentially field-orientated research of the Department was enhanced by a substantial and expanding analytical back-up. At the heart of this was the Isotope laboratory. Its solid source mass spectrometer, the basics of which were donated by the Max Planck Institute in Germany, was reassembled by Jan. The first Rb-Sr whole-rock ages were obtained in September 1984. The laboratory was later updated to serve the SADC region. As the laboratory developed, theoretical progress resulted in Dr J.D. Kramers' pioneering MARCY (MAantle ReCYcling) model, which attracted international attention. Jan became Chairman of the Geology Department in 1990-1991. He left to take a Professorship at the University of Berne, from where he continued to collaborate with his students in the research interests of the Department, notably the Limpopo Belt. Jan is a former Chairman, committee member and Phaup Award winner of the Society. He was invited to present the 7th Macgregor Memorial Lecture in 2003, entitled "The Limits of Uniformitarianism". At his presentation in Harare the 'Jan Kramers Museum in the Geology Department was named for him.

MR T.J. BRODERICK

Graduating from Rhodes University, Grahamstown in 1971, Tim Broderick joined the Geological Survey Department for which he undertook regional geological mapping in the Kariba, Makuti and Mateke areas. After a stint at the Economic Geology Research Unit at the University of the Witwatersrand on the study of the coal industry, he returned to the ZGS as Chief Field Geologist where he was closely involved in the restoration of regional geological mapping, mostly through the assistance of international aid programmes. He was also close to the developing exploration interest for coal, hydrocarbons and uranium that was centred on the Zambezi Valley and he established himself in the field of geological investigation for dam sites. Late in 1988 he joined an established ground water consultancy in Harare and has continued his services in the fields of hydrogeology and dam site investigation. Tim was a joint winner of the A.E. Phaup Award in 1983, was Chairman of the Geological Society of Zimbabwe in 1985 and 2002 and has served the Committee periodically. He was invited to deliver the 8th A.M. Macgregor

Memorial Lecture in 2005 with the title “130 years of Regional Geological Mapping - Zimbabwe’s Heritage and a Challenge for the Future”.

GEOLOGICAL SOCIETY OF ZIMBABWE: CONTACT DETAILS OF MEMBERS OF THE EXECUTIVE COMMITTEE

NAME	PORTFOLIO	EMAIL
Gumbo, Hillary	CHAIRMAN	hgumbo@mweb.co.zw
Musiwa, Kudzai	Vice Chairman	kudzai@eng.uz.ac.zw
Hanssen, Gayle	Secretatary	dms@zol.co.zw
Mwatahwa, Collins	Treasurer	cmwatahwa@unki.co.zw
Broderick, Tim	Newsletter Editor	jpaa@mweb.co.zw
Matura, Nyikadzino	Newletter Editor	nematura@science.uz.ac.zw
Du Toit, Andrew	Society Field Trips	dutoit@mweb.co.zw
Ravengai, Seedwel	Website	seedwel@yahoo.com
Chikutiro, Desire	Midlands Representative	dchikutiro@zal.co.zw
Hwata, Joseph	Bulawayo Representative	Joseph.hwata@zw.debeersgroup.com
Shoko, Dennis	Society Talks	dennis_shoko@excite.com
Temba Hawadi	Geological Survey of Zimbabwe Rep	zgs@africaonline.co.zw

Institutional Membership, 2006

Anglo American Corporation Zimbabwe Limited

Blanket Mine (1983) (Private) Limited

De Beers Zimbabwe Limited

Hwange Colliery Company Limited

Minerals Marketing Corporation of Zimbabwe

Pan-African Mining (Pvt) Limited

Rio Tinto Zimbabwe Limited

Rockover Resources (Pvt) Limited

Samrec Vermiculite Zimbabwe (Pvt) Limited

SRK Consulting Zimbabwe (Pvt) Limited

University of Zimbabwe, Geology Department

Zimbabwe Alloys Limited

Zimbabwe Platinum Mines Limited