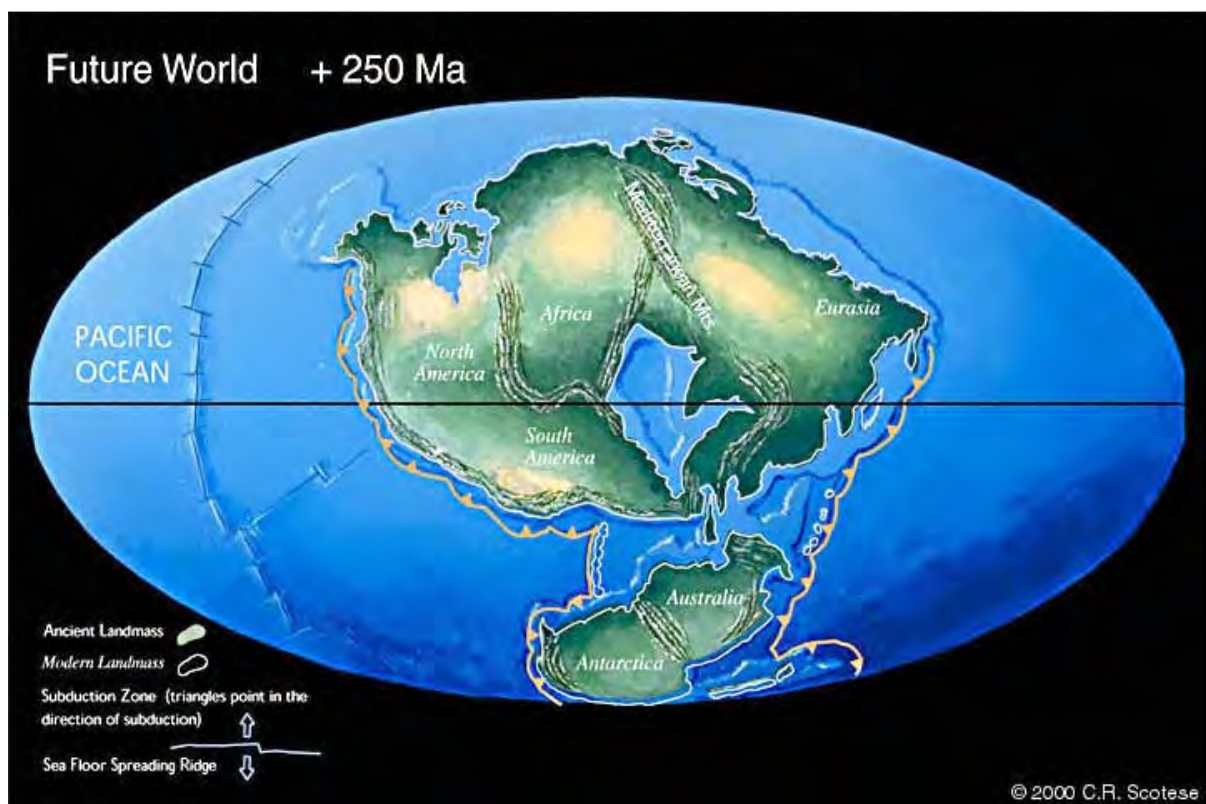


SOUTH AFRICAN GEOPHYSICAL ASSOCIATION

SOUTH AFRICAN GEOPHYSICAL ASSOCIATION

FOUNDED IN 1977

Earth Crust Displacement



This could be what the continents look like in 250 Ma time? Or will they?

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Albert Einstein

NOVEMBER 2011

SAGA

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FEES

Anyone wishing to join SAGA can please contact Charlene above.

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Adverts must preferably be submitted in either MS Word, Pdf or Jpg format, or some other format readable by either Eg. Ascii, etc.

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(to order, contact SAGA administrator)

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Practical Manual in the Resistivity Method	R50	US\$50
J S V van Zijl 1985. 136p.		
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*Students half price # Prices subject to change - copies made from masters

From the Presidents Desk

In the world today there is a lot of discussion about mankind's impact on the environment, with the Economist magazine going so far as to declare the 19th century the start of the 'Anthropocene' Age. While geophysics, along with other earth sciences, has a lot to contribute towards this developing debate, a more pressing issue of sustainability confronts us - that of the future intake of geophysics students. We now see few industry bursaries being given to promising students in South Africa, despite a buoyant labour market for those with a degree and that vital ingredient of experience. Few students or their families are able to fully support themselves for either course fees or living expenses. Your society is currently working on funding mechanisms for current and future students - we have already given ad hoc support to deserving students, and are currently working with members who have generously promised money and time to support and mentor students. The GSSA has also been very open about its own experience with supporting students. We intend to have more to announce before our next annual meeting.

Our relationships with our sister societies have never been better - Geosynthesis was an outstanding success, and George Smith deserves our thanks for his tireless efforts as chair. While the final tally is still awaited, it appears that close to 50% of the attendees were from SAGA, and more than 50% of the exhibitors were offering geophysics related services. This points to a healthy market for our discipline, which means we can work on the student funding I mention above.

Members are informed that the legal claims brought against SAGA by Sun International relating to the 2009 Swaziland conference are being defended. We are following what will be a slow (and probably expensive) legal process, and members will be informed of any significant developments.

I'd like to thank Gavin Selfe for giving me a lot of support in his role as Vice President since I'm on the road so much (this being written from my second home in Heathrow T5). I'd also like to thank Laurent Ameglio for his talk in September on the AUV he's developing with his French partners. SAGA is very ably administered by Charlene Skipp, who also deserves our thanks. Lastly, thanks to the council members for their oversight of the society - their contributions in time and skill are vital to our present and future success.'

-Mark Gibson

From the Editors keyboard.....

Well, having promised a newsletter every 6 months, I see one year exactly has passed. Muchas apologias everyone! I cannot believe how time flies.

In this newsletter I've decided to try some new things, and please let me know by email if you enjoyed them or not. Firstly, I decided to try more of an industry focus than the traditional academic one. Hence, I asked some people working in industry to write an article or two. I've also decided to do articles on home grown geophysical companies in southern Africa, not for free advertising but to encourage more entrepreneurs to get out there and start their own thing. The series of articles I intend publishing in subsequent

newsletters should be more of an insight on how certain successful service providers were started-up, and the potential pitfalls to look out for.

The article on Earth Crust Displacement (ECD) is timely I believe, because 2012 is just around the corner. I am no doomsday merchant, but as earth scientists we should all be interested in this theory, and in proving it or disproving it one way or the other. Who better to pass comment on ECD than geophysicists who spend their time mapping the deep lithosphere with continent-wide seismic arrays? And we have a few of those in the RSA.

The Geosynthesis conference was a great success and I hope you were all there. I have written up something on the whole affair and published the best paper and poster awards. Our relationship with the Geological Society (GSSA) is strong and as a result they are going to publish a current affairs article in each of our newsletters, and we are going to reciprocate with a regular column in GeoBulletin.

Finally, importantly, SAGA is getting involved with creating student geophysics scholarships. The current committee does not want to sit back and watch the potential demise of geophysics as a pure Honours, MSc or PhD degree at Wits. We should not forget that Wits is the *LAST* university offering these degrees in sub-Saharan Africa. Not only have we decided to start the ball rolling by offering SAGA scholarships for next year, but we are encouraging everyone in the industry to get involved and certain individuals have already done so. Please read the *Breaking News* section on scholarships and ask yourself if you or your company can contribute!

- Gavin Selfe

SAGA membership status

The current health of our society:

- **Current student membership** = 40
- **Current (paid-up) members** = 271
- **Members who joined in 2011** = 10

We have decided to stop reflecting those members who have not paid their subscription fees in the last 3 years. From now on, only members who are a maximum of 2 years outstanding in their subs will be considered members. Needless to say, anyone who is not paid up will not receive the special SAGA membership fees for courses and conferences.

This leaves us with the sobering thought that in fact we only have 271 members.



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Industry Colleagues Working Overseas

I thought it would be interesting for SA Saga members to see how their colleagues who have moved overseas are doing. Herewith the first in a series of industry articles, by Kazek Trofimczyk.....

"It's a year now since I left Johannesburg to join BHP Billiton's iron ore group in Perth, Western Australia. So for my friends and colleagues back in South Africa, an update from Oz.

Having worked in all other major commodity types in my career so far (excluding oil and gas), why iron ore? After all, the stuff all outcrops (at least it does in the Pilbara). The ore bodies are huge and shallow. So what's in it for geophysics? The big miners seem convinced – BHP Billiton Iron Ore employs more than one geophysicist, Rio Tinto has settled on six! I can think of other minerals possibly more 'deserving' of the attentions of geophysics with not an in-house geophysicist in sight.

So these iron ore guys are serious about geophysics! Actually, iron ore turns out to be a quite interesting business. And just in case you thought we knew all about iron ore (seeing as it does outcrop), there is still no consensus on how the enriched Pilbara iron ore bodies formed ... supergene vs hypogene and everything in between. What you think you're looking for dictates how you look for it, including what you make of your geophysics, and there is a lot of geophysics available for the Pilbara. Practically all of it is covered by multi-parameter airborne surveys of various vintage so it's a veritable geophysical feast.

But geophysics is also not just about finding ore bodies. It's also about defining them. For a shallow, bulk mining commodity, you just drill, and drill, and drill, and drill ... and since the Aussies are a practical, no nonsense bunch, most of the drilling is RC percussion and all of it gets the geophysics treatment. So this is the slice of the geophysical pie I get stuck into mostly.

Our geophysics team is based in Perth within Iron Ore Technical Development. The Pilbara iron ore deposits are located some 1100 km away in the north-west region of Western Australia, and with a geological exploration team of a couple hundred or so spread across 3 major mining hubs, there is no shortage of projects and interesting and challenging problems. The geophysical brief is a mixture of team service (technical input, training and mentoring), innovation and governance.

So it's lots of flying up to site, which is not a bad thing as it's a beautiful part of the world (see picture). And it's lots of planning so you're there when the people you want to see are there – almost everyone working in the Pilbara is on FIFO (fly in, fly out), 8 on 6 off, or 9 on 5 off, or 2 weeks on 1 week off (contractors), or 5 4 3 2 (don't ask, it exists) and others.

In summer there's the heat – daily 40 degree plus – and the flies, and the odd cyclone or two (one even got close to Perth last summer). All your basic requirements are provided including the work clothes – BHPB orange and blue (does not apply to Perth in case you were wondering...). Morning Safe Start is compulsory across all site operations and ends with an exercise session. Yes, we even get to do group stretches in the Perth office, although thankfully just once a week. But as the Aussies like to say, 'It's all good' !



The remote outback on the Pilbara craton.

Well, that's all for now folks. We have to increase the DSO (direct shipping ore) from 150 Mt/a to 300 Mt, so I gotta get going. Cheers for now, Kazek."

Deepest-living land animal found

By Jennifer Carpenter Science reporter, BBC News

Worms have been found living at depths in the Earth where it was previously thought animals could not survive.

Discovered in South African mines, the roundworms can survive in the stifling 48C (118F) water that seeps between cracks 1.3km beneath the Earth's crust.

The find has surprised scientists who, until now, believed only single-celled bacteria thrived at these depths.

[Writing in the journal Nature](#), the team says this is the deepest-living "multi-cellular" organism known to science.

The researchers found two species of worm. One is a new species to science, which the scientists have named *Halicephalobus mephisto* after Faust's Lord of the Underworld.

The other is a previously known roundworm known as *Plectus aquatilis*.

Until now, only single-celled organisms, like bacteria and fungi, have been recovered from kilometres beneath the Earth's crust. The lack of oxygen is thought to stymie attempts by anything larger to make its home there.

But this has not stopped scientists looking.

Impossible depths

The Earth's subterranean world is only accessible to researchers in a handful of places worldwide where ore-mining requires drilling to reach depths of more than 3km.

Taking advantage of two such sites - the Beatrix and Driefontein gold mines in South Africa - the international team of researchers placed filters over the mines' bore-holes through which thousands of litres of groundwater pour.

From these samples they usually recover only bacteria; so the worms were a surprise.

"It scared the life out of me when I first saw them moving," said geo-microbiologist Dr Tullis Onstott of Princeton University in New Jersey, US. "They look like black little swirly things," he added.

These worms seem capable of surviving in very low levels of oxygen - at 1% of the levels found in most oceans, explained Dr Onstott.

But how did the worms get there?

The water in which the worms were found is between 3,000 and 10,000 years old, and so it is unlikely that the researchers brought the worms with them into the mines.

An ancient seep

The scientists, for now, believe that the animals originally came from the surface but got washed down into the cracks in the Earth's crust by ancient rainwater.

Dr Gaeten Borgonie, a member of research team, explained that he thinks the animals look very much like the tiny worms that live in rotting fruit and soil at the surface, and probably descended from them.

Worms at the surface experience great extremes of temperature and can survive being frozen and thawed, dehydrated and re-hydrated, he told BBC News.

Dr Borgonie believes that worms already have some of the "attributes necessary" to survive at these great depths. So it wasn't a surprise to him that the first multicellular organism to be found in the deep subsurface of the Earth was a worm.

The authors of the study expect to find other multicellular animals far beneath our planet's surface, and are preparing to descend again to search for others.

Report-back on Geosynthesis

The Statistics...

446 delegates altogether, of which 96 were international, and 350 from SA and neighbouring countries.

3 field trips: 60, 54 and 4 participants making 118.

5 courses: 9, 11, 7, 16 and 38 participants making 81, with 15 presenters altogether.

40 exhibition stands, with 92 people manning them who were not delegates. Thus 446 plus 92 = 538 participants altogether.

138 papers, plus 116 Inkaba papers, plus 3 plenary speakers, making 257 altogether.

23 posters, plus 91 Inkaba, making 114 altogether.

135 students out of the 446 conference delegates.

The SAGA Best Paper/Poster winners were:

Best Paper: *'Magnetic Evolution of the Geothermal History of the Western Karoo Basin'* by Leonie Mare (Council for Geoscience), Michiel de Kock, Hassina Mouri and Bruce Cairncross (University of Johannesburg).

This contribution has implications for shale gas exploration, addressing the problem of dolerite intrusion into the Karoo stratigraphy, and how this may affect hydrocarbons.



Leonie Mare



Xiaoming Chen

Best Poster: *'Study of the Geoelectrical Anisotropy of the Cape Fold Belt'* by X. Chen and U. Weckman (Helmholtz Centre, Potsdam).

The work was done under the Inkaba yeAfrica program and documents modelling results for the character of magnetotelluric and electrical anisotropy along Cape Fold Belt collisional zones.

Also **highly commended** were: *'Using GOCE satellite data for the exploration of the African lithosphere'* by Aurelie Peyrefitte; *'Wavelet based raman spectral comparison'* by

Gordon Cooper; 'Another example of SPM effects in AEM data?' by Jaco Smit, and '3D inversion of full tensor magnetic gradiometry' by Glenn Wilson.

The GSSA/GASA Best Paper/Poster winners were:

Best Paper (1) – '*Kimberlites Sourced by Plumes from the Core-Mantle Boundary*' by Trond Torsvik (University of Oslo), Kevin Burke (University of Houston), Bernhard Steinberger (Geological Survey of Norway), Susan Webb and Lewis Ashwal (University of the Witwatersrand); delivered by Sue Webb.

This paper is a great example of innovative science from a global team, and it focuses on one of the major earth science debates of the day – plate motion or plume emplacement as the responsible agent for a host of geological phenomena.

Best Paper (2) – '*The Geological and Geochemical Characterization of Namakwa Sands Heavy Minerals Mine Ore Types and Their Effect on Beneficiation*' by Dennis Alchin, Sifiso Mhlongo, and Elaine Magnus (all from Exxaro); delivered by Sifiso Mhlongo.

The presentation took us through the geological and geochemical variation in the Namakwa Sands deposit, relating the geology to beneficiation.

Best Poster – '*Geological and Geophysical Characteristics of an Archean Suture Zone, Barberton Greenstone Belt, South Africa*' by Scott MacLennan, Maarten de Wit and Moctar Doucoure (AEON Centre, University of Cape Town).

The work is part of the Inkaba yeAfrica proceedings, and reports on the geological and geophysical evidence for interpreting the Inyoka Shear Zone, Barberton Greenstone Belt, as a major suture zone separating lower grade greenstones from higher grade gneiss complexes.

Congratulations to all winners, and to the authors of all presentations for the high quality of the conference proceedings !

Conferences of the size and calibre of Geosynthesis don't happen by themselves and SAGA would like to heartily thank all of the sponsors, as well as the following people on the **conference committee**:

Chair: George Smith (SAGA)

Vice-Chair: Mike Venter (GSSA)

Technical Committee Chair: Paul Macey (GSSA)

Tech Comm Vice-Chair: Sean Duggan (GASA)

Committee member: Craig Smith (GSSA)

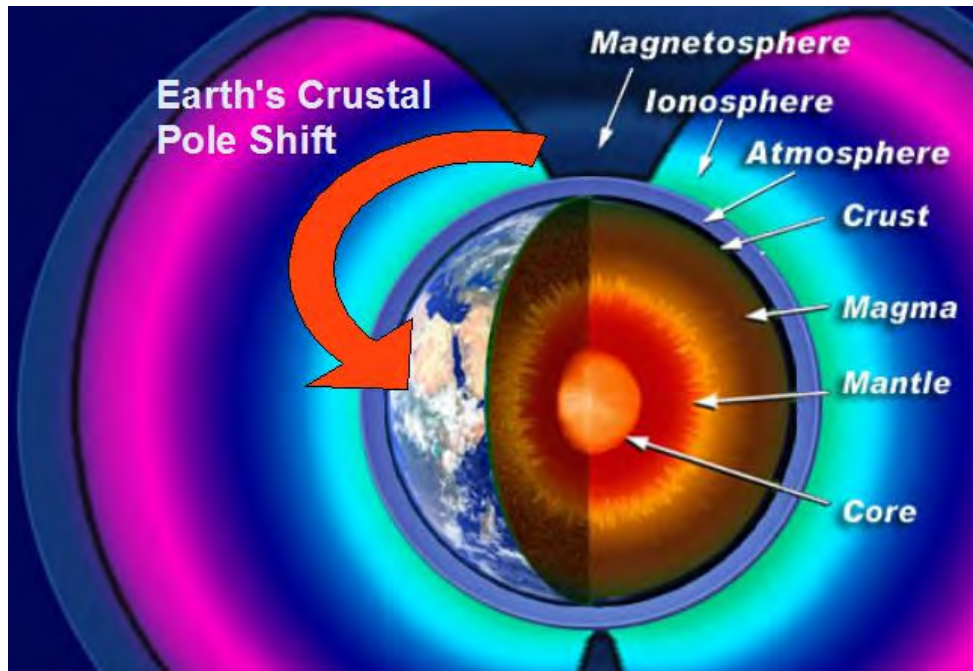
Inkaba ye Africa representative: Elronah Schaap (from Pretoria)

ILP representative: Leni Scheck-Wenderoth (from Potsdam)

A special mention is made of **Eddie Kostlin**, who brought in some big sponsors.

And at **SBS**: Peter Aspinall, Natalie Smit, Esther Xube and Antony Maltz. According to George you were a pleasure to work with.

Our Cover Story.....ECD



We don't have to like it, but we should know about it...

So what's the big deal about Earth-Crust Displacement (ECD)? Well, recently it's been put forward by Hollywood in the movie '2012' as the method by which the Apocalypse occurs. But this newsletter is a scientifically-based one so why should we care; and surely support from authors like Graham Hancock doesn't help? Well, ECD has a reasonably serious origin, one serious enough that apparently Albert Einstein wrote the foreword to the book in which it was first published.

The book was *EARTH'S SHIFTING CRUST: A KEY TO SOME BASIC PROBLEMS OF EARTH SCIENCE* by Charles Hapgood (published in 1958 by Pantheon Books, New York). On the 18th of May 1954, Einstein wrote this in his foreword:

"I frequently receive communications from people who wish to consult me concerning their unpublished ideas. It goes without saying that these ideas are very seldom possessed of scientific validity. The very first communication, however, that I received from Mr. Hapgood electrified me. His idea is original, of great simplicity, and - if it continues to prove itself, of great importance to everything that is related to the history of the earth's surface. I think that this rather astonishing, even fascinating, idea deserves the serious attention of anyone who concerns himself with the theory of the earth's development."

The basic notion of ECD is that the earth's lithosphere, although composed of individual plates, can at times move as a whole over the asthenosphere, like the loose skin of an orange. Hapgood indicated that his research was initiated because of an ancient map which showed Antarctica with free flowing rivers, and paleontological data that Woolly Mammoths, and other ancient animal species, have been found frozen solid with undigested vegetation in their stomachs. This suggests that a single cataclysmic event occurred with such ferocity that it killed these species in a very short space of time.

Hapgood claimed that the extensive weight and uneven placement of ice over the North American landmass during the last ice age period could possibly have caused such a massive slip. Einstein began to support the theoretical probabilities that such events could happen, and have happened, in earth's history.

Ref http://www.maar.us/crustal_displacement.html

Unfortunately Charles Hapgood was not a geologist; he was a professor of the history of science at Keene College in New Hampshire. His theory has not been taken very seriously because of this. Hapgood claimed that towards the end of the last ice age, around 12,000 years ago, the extensive mass of glacial ice covering the northern continents caused the lithosphere to 'slip' over the asthenosphere, moving Antarctica, during a period of at most several centuries, from a position in the middle latitudes to its current location, and at the same time rotating the other continents. Antarctica's movement to the polar region precipitated the development of its ice cap. Similarly, by shifting the northern ice sheets out of the arctic zone, the end of the ice age was facilitated. It is well-known through continental drift and plate tectonics that the earth's landmasses are not stationary, but form parts of large, independently moving crustal plates. This motion is, however, very slow in human terms, and the 30 degree shift proposed by Hapgood would take millions, if not hundreds of millions, of years to complete according to plate tectonics.

(Steve Krause, December 6, 1996)

(http://www.skrause.org/writing/papers/hapgood_and_eed.shtml)

So what do some of the scientists out there say about ECD ?

(We would be happy to hear from our local gurus, please email the editor and your response will be published in the next newsletter)

Lack of evidence alone does not disprove a theory. So far, no logical inconsistencies have been found in the theory of ECD itself. Perhaps a 'slip' with respect to Antarctica did not occur when and where Hapgood claims, but it might still be possible to save ECD as a theory and tie it to plate tectonics. Valid scientific theories in general have to do two things: explain current data, and answer questions that arise from the logical consequences of the theory. ECD runs into problems particularly with regard to the second requirement.

The first problem comes from the concept of isostasy, which is "the balance or equilibrium between adjacent blocks of crust resting on a plastic mantle" (Plummer and McGeary, 1996, p. 521). Einstein's claim in Hapgood (1958) that at a certain critical point, a slip of the earth's crust is bound to occur due to an unevenly distributed ice mass fails to take isostasy into consideration. The earth's crust is not rigid, as Einstein stated. Instead, as ice builds up on a landmass, that landmass is depressed an appropriate amount to carry the load. Greenland provides an excellent example of this process (Dyson, 1963, p. 103) Also neglected by Hapgood and Hancock when considering ice-masses is the fact that under high pressure, ice becomes plastic, that is, it will flow in a viscous fashion. As a result, glaciers are not static sheets of ice, but rather moving bodies of ice, that expand outward (continental) and downhill (alpine). When glaciers reach the sea, they don't simply continue to build up: pieces break off and form icebergs. Hence, between isostasy and the tendency of ice to flow plastically, the critical point mentioned by Einstein would probably never be reached.

http://www.skrause.org/writing/papers/hapgood_and_eed.shtml

(Also, one would think the deep, grounding roots beneath mountain chains would make any kind of rapid lateral shift extremely unlikely – Ed).

Palaeomagnetism is now a well-established branch of earth-science and provides credible evidence for gradual continental drift. Unusually large, rapid movements of any continent would surely have been detected as an anomaly by now. Although most palaeomagnetic work is done in the tens- and hundreds-of-millions of years bracket, it is possible to date ash layers from volcanic eruptions using these techniques in the thousands-of-years bracket.

The whole concept of the lithosphere gliding over the asthenosphere “as the skin of an orange over the inner part of the orange” (Hancock, 1995, p. 10) is misleading. Just as the lithosphere is not a rigid body, the asthenosphere is not as liquid as Hancock believes. Instead, it is composed of highly viscous rock, which, due to high pressure and temperature, behaves plastically (Plummer and McGeary, 1996, p. 425). The asthenosphere does act as a lubricating layer for the lithosphere, allowing it to move, but due to its highly viscous nature, it cannot permit the rapid, large-scale, motion claimed by ECD.

Also, if the lithosphere were to rotate around an axis over the asthenosphere, one would expect greater torque and friction between the lithosphere and asthenosphere near the poles of rotation than further away from the poles. Assuming ECD takes place, it seems logical that near the poles of rotation there should have been some form of increased geologic activity, such as faulting or volcanism, due to increased friction between the lithosphere and asthenosphere. However, Hapgood never covers this point.

A final nail in the casket for ECD might very well be the existence of hot spots, which are areas of “volcanic eruptions and high heat above a rising mantle plume” (Plummer and McGeary, 1996, p. 521). Yellowstone National Park, for example, sits on one such hot spot. Since the existence of a hot spot rests upon presence of a mantle plume, ECD would cause a dramatic shift in the locations of such hot spots. However, since evidence shows Yellowstone to be a very old hot spot, this weakens the possibility of such a shift due to ECD occurring.

Ref: http://www.skrause.org/writing/papers/hapgood_and_eed.shtml

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GSSA Update

*Update from the Geological Society of South Africa
Dr Craig Smith (Executive Manager, GSSA)
November, 2011*

Over the last couple of months, the major event of the GSSA, SAGA and GASA was the Geosynthesis meeting held in Cape Town in late August – early September. This was a first attempt at combining different earth science disciplines (geology, geophysics, and geostatistics) into one event, with the objective of promoting more networking across the disciplines. In today's world, the typical industry employee operates in all three of the sub-disciplines – and probably quite a few more as well. The Exhibitors and industry representatives that attend meetings like this want to get as much bang for their buck as they can, so they like to see the cross-disciplinary events that have the potential to attract larger numbers of delegates. Some would argue that the having very small meetings focused on very specialized topics is preferable, and this is appropriate for the R&D community when a detailed level of presentation and discussion is required to really pick apart a topic. But it's also useful to have the larger meetings – which is where networking and meeting new people who may become collaborators and partners is a key 'deliverable'. Let's face it, the larger meetings are where the most marketing of yourself and your science can occur outside your specific discipline.

Was Geosynthesis a success? We believe that it was, though it may not be appropriate to hold a joint meeting every year or even every two years. The GSSA, SAGA, and GASA management teams are the process of assessing this.

The GSSA hosts the Directorate of Professional Programs, which runs between eight and fifteen smaller meetings annually; these tend to be highly focused events and continue to be popular. Some of these are hosted in partnership with other organizations, and one in the planning stages is 'Geophysics for Geologists'. I believe this would be very popular for younger professionals in particular; we shall see how it develops.

There are a couple of major events coming up in the next few years which the geophysics community needs to be aware of. First, the Mineralogical Society of South Africa, a specialist division of the GSSA, is hosting the International Mineralogical Association meeting in 2014 (IMA 2014). While much of the subject matter may be peripheral to geophysics, there will almost certainly be sessions on hyperspectral scanning and imagery – as applied at mineral scale. I would also not be surprised to see contributions on tomographic imaging.

A bigger event is planned for 2016. The Council for Geoscience is the lead bidder, supported by the GSSA, in an effort to bring the first **International Geological Congress** to Africa since the 1920's. This meeting will be held in Cape Town, and it will attract thousands of delegates from a wide variety of earth science disciplines from across the globe. A differentiating feature of the IGC meetings has always been the emphasis on field excursions, and there will be large numbers of trips run into a variety of African countries. This is not a South African conference, but an African conference, and we are aiming for participation from across the continent. Geophysics aimed at geologists will no doubt play an important role in that meeting. The conference organization is well under way, the IUGS site visit has just been held, and the branding has been established, so watch this space.

SAGA Courses

A very successful SAGA course 'QC of Radiometric datasets' was held in Swakopmund at the end of October. Around 30 geologists attended, thanks to advertising through the GSSA. The course was given by Branko Corner and Greg Symons. A very big thank-you to you two from us at SAGA.

Dr Laurent Ameglio was recently asked to head-up a SAGA sub-committee for short courses. Laurent has sent us the following possible course titles to be held next year. These have yet to be finalised and you will all be informed timeously by email. Thank-you Laurent for taking this up.

1. Magnetic workshop. Joint SAGA / ASEG.
2. Geophysics for geologists (SAGA addressed to GSSA members and industry).
3. Geophysics for non-geologists (SAGA but addressed to other organisations such as SAIMM).
4. An inversion course (SEG DLP).
5. Downhole geophysics from data acquisition to interpretation (SAGA).
6. An EM course for geophysicists to coincide with the release of the updated SAGA EM manual.

Breaking News!!

Scholarships

It is with great pride that SAGA announces we will make two scholarships available in 2012, worth R50,000 each, to the top male and female students wanting to study Geophysics Honours !!

This has been brought about by the dire state that Geophysics finds itself in, according to Sue Webb. Sue tells us that nearly all the good Physics students are being attracted away by funding from the Square Kilometre Array (SKA) telescope and the nuclear development program, and most of them are doing pure Physics Honours as a result.

This is what Prof Michael Jones has to say:

Since 2003 I have been responsible for recruiting geophysics students, arranging the course and getting them through. Some of our students have been excellent , others mediocre, and some that have scraped through or failed without prospect of a job. One of the main obstacles in attracting top students has been the lack of bursary/scholarship funding that can be offered up front. Any support of this kind that can alleviate this aspect of student recruitment will ensure a better quality of future geophysicists. We are undersubscribed in that we can take in more students but we want the good ones.

Michael Jones

School of Geosciences, University of the Witwatersrand

SAGA has decided that we must get involved as we are talking about the next generation of geophysicists in southern Africa. Mark Gibson is actively engaging with heads of companies about an industry-funded scholarship trust which will be administered by SAGA. *We are therefore sending out a request to all exploration and mining companies, individuals and geophysical industry service providers to contact us if you would like to get involved (contact details on page 2).*

We have already had one very positive response. **Neville Brown of Geophysical Surveys and Systems (GSS)** has made the incredibly generous offer to sole fund two R30,000 geophysics scholarships in 2012!

Neville writes as follows:

"Neville Brown, a local contractor (Geophysical Surveys and Systems) has agreed to put up R60,000 towards geophysical students in 2012. This will probably be made up of two scholarships of R30,000 each but the format may vary depending on the individuals situation. The scholarship(s) would not necessarily carry a work obligation but may provide work and thesis opportunities. Students with an interest in electrical geophysics (IP/EM/AMT and its many variants) would be favoured. Award would be decided in consultation with the relevant Wits department heads.

This is being done on a one off basis for 2012 but it is hoped that the local industry and SAGA will assist in the creation of a more sustainable scholarship program. The SAGA committee and certain individuals are already working on this with Sue Webb. Anyone interested in providing support should contact Sue Webb.

A big concern to everyone who makes a living from geophysics should be that our industry is ageing. We only have to look around at SAGA meetings and conferences to realise that the geophysical service providers average age is probably 50+. As a technology driven industry we should have more youngsters that were born into the internet driven information age. Supporting our students is one way to change this demographic. This should be considered a challenge to everyone who can help either financially or through mentorship."

I suggest that a contractors/consultants group be formed with a view to providing financial support and/or mentorship and work opportunities to students. At some stage a round table meeting of everyone interested or with suggestions may be a good idea. If we involve the student group it could be a better party than book club!"



Neville Brown of GSS

There is not much more that we can say except a massive 'Thank-you, Neville'. And we will be taking up your suggestion of a round table meeting of everyone concerned, once we have gauged industry appetite for getting involved.

Industry Start-up Stories

This is Part 1 of a series on home-grown geophysical service providers that we would like to run to encourage more entrepreneurship. Any company that would like to feature can send their start-up story to the editor.....

New Resolution Geophysics (NRG)

By Faye Worrall

New Resolution Geophysics is an airborne geophysical contractor specializing in airborne gravity and helicopter borne magnetic and radiometric surveys. Ollie Wright, Roger Wright and Adam Wooldridge formed the company in 2005 with the objective of providing a technically superior, efficient and professional service.

Focusing on the African continent and Middle East, the company has completed in excess of 1 800 000 line km's of surveys in over 40 countries.

The group is unique in that it owns and operates a fleet of eight new generation turbine powered aircraft. With each technology offered NRG aims to deliver an industry-leading product.

NRG are very aware that their good name is their most important asset and are extremely focused on providing an exceptional service to the exploration industry.



Starting a new survey company had many rewards as well as challenges. The issues that initially needed addressing were:

- Financial viability.
Millions of rand would have to be used as seed capital. Was there a market to sustain and return this investment? Research indicated that there was a requirement for a professionally run, high-resolution airborne contractor in Africa.
- Geophysical equipment
The electronic equipment commercially available at the time did not meet our stringent design criteria. We had to develop a new magnetic counter and acquisition system from scratch. The counter had to be capable of sampling the Lamor frequency at over 1500 hz and the acquisition system was required to routinely sample and record all the ancillary channels at 20 hz. These specifications were roughly double of what was available at the time. The prototypes were also subject to intensive oven and vibration testing to ensure that the system would be reliable in the often-demanding field environment.
- Aircraft selection
A helicopter was required that could carry the Geophysical payload and be reliable in operating in remote areas. The AS350 "Squirrel" turbine helicopter was selected, as it is ideal for the close terrain following required for geophysical surveys. The unique Starflex rotor system and ample power ensure that even the most stringent survey specifications maintained. The AS350 has an exemplary safety record.
- Staff and training
A very rigorous selection criterion was applied to the programmers, electronic engineers, pilots and field processors required to start the company. The field staff needed to be committed to spending protracted time in the field in sometimes fairly basic conditions. Pilots were trained how to fly low-level survey in a safe and exact manner. Field processors needed to be proficient in the new generation software and data vetting procedures.
- Testing and commissioning of a new system
In order to ensure that we would provide high quality data from the onset we flew numerous non-revenue generating test surveys locally. The data from these surveys were critically reviewed and minor system modifications introduced. Pilot and field staff training was also monitored and refined until we could routinely capture excellent data.

A three-month period was allocated to the above and it is a testament to the capability and dedication of the team that the first prototype was completed within this period. Our first survey in Tanzania resulted in a high quality end product and the NRG team will always be grateful to the clients who had the confidence to initially make use of our services.

Even though we now have hangars at Lanseria, offices in Cape Town and Pretoria and employ over 40 staff we are still highly committed to retaining the personal and professional approach that has helped us grow into a leader in the airborne geophysical market.

With the continual development of new hardware and software NRG ensures that it remains at the forefront of geophysical data collection.
