

Novarupta — The Most Powerful Volcanic Eruption of the 20th Century June 6th, 1912

THE MORNING OF JUNE 6TH arrived on the Alaska Peninsula to find the area which is now Katmai National Monument being shaken by numerous strong, shallow earthquakes. The most powerful volcanic eruption of the 20th Century was about to begin – but very few people knew about it. The Alaska Peninsula has a low population density today, but in 1912 it was even lower. Beyond the land shaken by the earthquake activity, the beginnings of this event were almost unnoticed.

Volcanic Monitoring — 1912 vs. Today

Today the stirring of an important volcano draws enormous global attention. Weeks or even months before most large eruptions, a buzz circulates through an electronically-connected community of volcano scientists as clusters of small earthquakes are detected by a global array of seismographs. Many scientists working at diverse global locations interpret this data and begin to collaborate about an awakening volcano and the eruption that might follow. Reports are posted on the internet and news stories communicate the volcano's activity to millions of people. Often it is a false alarm – the volcano is simply stirring.

If the earthquakes strengthen and begin moving upwards, many of these scientists will travel to the area of potential eruption to make observations and set up a local network of data-gathering instruments. However, in 1912, Alaska was not a US state, very few scientists were supported to do volcanic studies and a worldwide network of seismic monitoring was not in place. Scientists were just starting to understand the mechanics of volcanic eruptions.

Novarupta Volcano Erupts!

On June 6th 1912 a tremendous blast sent a large cloud of ash skyward and the eruption of the century was underway. People in Juneau, Alaska, about 750 miles from the volcano, heard the

sound of the blast – over one hour after it occurred.

For the next 60 hours the eruption sent tall dark columns of tephra and gas high into the atmosphere.

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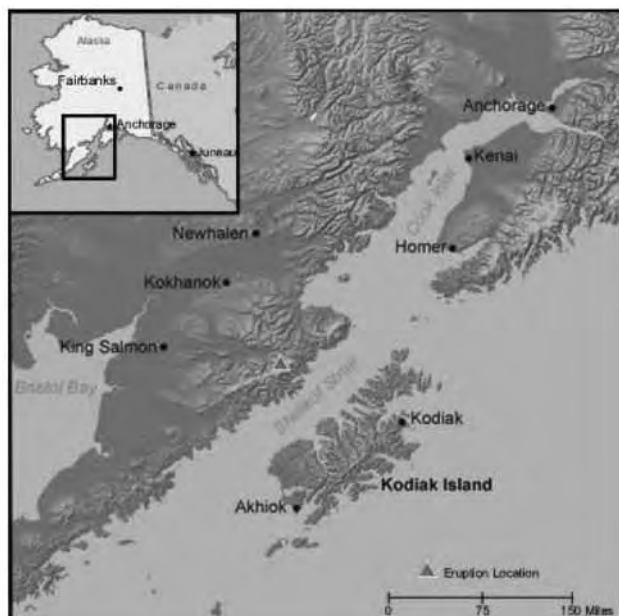


Figure 1. Approximate location of the June 6th, 1912 eruption. Ash fell on the town of Kodiak for three days and although the town was about 100 miles from the volcano, it was covered with over one foot of ash which collapsed many buildings.

Map by Geology.com and MapResources.

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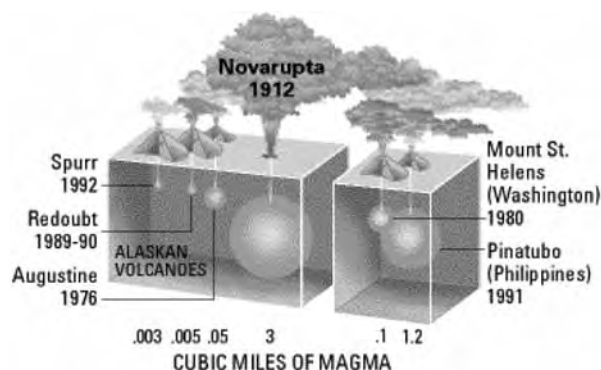


Figure 2. The relative size of the Novarupta eruption compared to other volcanoes on the basis of cubic miles of magma ejected. USGS Image.

By the time the eruption ended the surrounding land was devastated and about 30 cubic kilometres of ejecta blanketed the entire region. This is more ejecta than all of the other historic Alaska eruptions combined. It was also thirty times more than the 1980 eruption of Mount St. Helens and three times more than the 1991 eruption of Mount Pinatubo, the second largest in the 20th Century.

Impact of the Eruption

The inhabitants of Kodiak, Alaska, on Kodiak Island (Figure 1), about 100 miles away, were among the first people to realize the

severity of this eruption. The noise from the blast would have commanded their attention and the visual impact of seeing an ash cloud rise quickly to an elevation of 20 miles then drift towards them would have been terrifying.

Within just a few hours after the eruption a thick blanket of ash began falling upon the town — and ash continued falling for the next three days, covering the town up to one foot deep. The residents of Kodiak were forced to take shelter indoors. Many buildings collapsed from the weight of heavy ash on their roofs.

Outside, the ash made breathing difficult, stuck to moist eyes and completely blocked the light of the sun at midday. Any animal or person who was caught outside probably died from suffocation, blindness or an inability to find food and water.

Pyroclastic Flow

Back on the peninsula, heavy pyroclastic flows swept over 20 kilometres down the valley of Knife Creek and the upper Ukak River. (A pyroclastic flow is a mixture of superheated gas, dust, and ash that is heavier than the surrounding air and flows down the flank of the volcano with great speed and force.) These flows completely filled the valley of Knife Creek with ash, converting it from a V-shaped valley into a broad flat plain (Figure 3). By the time the eruption was over, the world's most extensive historic ignimbrite (solidified pyroclastic flow deposit) would be formed.

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From Your President

THIS IS MY FIRST REPORT to AIG members since taking on the role of President in May this year. It is an honour, and will no doubt be a challenge at times, to serve in this role for such a thriving organization.

A new AIG Council was also elected in May and we are fortunate to again benefit from the skills and capabilities of a committed group of geoscientists with a wide range of expertise and experience. In this issue of AIG News we include brief profiles of AIG Councillors for 2012-13 and encourage you to keep in contact with your Councillors and your state branch committee members.

I wish to acknowledge and sincerely thank outgoing AIG President, Andrew Waltho, for his contributions. He has given an extraordinary amount of time and effort to the AIG, both as a member of the Council and of the Queensland Branch Committee over a number of years. In the new Council for 2012-13 Andrew has responsibility for AIG's external relationships.

Since the election of the new AIG Council we have held a weekend meeting of Councillors in Brisbane to discuss and facilitate progress on the AIG strategic plan. Ongoing and new initiatives that have progressed in recent months include:

- development and testing of the AIG's online membership application process;
- launch of the AIG's national electronic newsletter;
- ongoing expansion of professional development opportunities for all AIG members;
- completion of another of AIG's regular surveys monitoring employment trends for geoscientists.

The results of AIG's June 2012 employment survey are now on the AIG web site (<http://tinyurl.com/aigemploymentsurvey>). There was an excellent response to the survey and, based on responses, unemployment and underemployment in Australian geoscience in June 2012 was 8.0%. This represents a small increase since June 2011, when survey responses indicated an underemployment and unemployment rate of 6.0%. The unemployment rate doubled from June 2011 to June 2012, from 1.5% to just under 3.0%, but remains below the unemployment rate of 5.3% across the wider Australian workforce.

While employment prospects for geoscientists remain strong at the moment, survey respondents report a marked decrease in confidence in retaining and regaining employment. This reflects the anecdotal evidence of growing concern amongst geoscientists about employment prospects and security, particularly amongst those working in the mineral exploration industry.

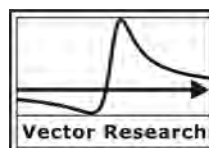
The AIG will continue to monitor employment trends for our members and endeavour to provide benefits to members to enhance their employment opportunities. We are particularly committed to providing ongoing professional development opportunities, and would value feedback from members about topics and issues that would be of benefit and interest to them. I would also like to remind members of the online training opportunities offered by the AIG Edumine campus, which provides members with access to a range of professional development resources (<http://tinyurl.com/aigedumine>).

In addition to providing professional development resources to AIG Members, the AIG is also focussed on developing training opportunities and resources that are particularly appropriate for our Graduate Members. Many graduates move rapidly from job to job, either through necessity or choice, and do not receive consistent training and mentoring in their early years. This is likely to become increasingly common if employment becomes less secure. A lack of support, mentoring, and training in a graduate's early years of geoscience practice poses a risk to their future employment prospects, and to the future quality of professional geoscience in Australia.

The AIG already offers seminars and workshops that are appropriate for our Graduate Members and we aim to expand the number and range offered. AIG state branches frequently organise workshops aimed at enhancing observational skills (e.g. alteration and breccia recognition) and developing practical skills (e.g. drilling for geologists). AIG is also in discussions with renowned geoscientists who are keen to develop field-based training courses suitable for geoscience graduates.

As I write this report geoscientists around the world are packing their bags, ready to head off for the 34th IGC in Brisbane in early August. This is a huge event that has taken many years of planning and organisation. Over 5000 delegates are registered, over 4000 abstracts have been received, there will be 30 concurrent sessions at the conference, and 40 field trips before and after the conference. The 34th IGC is a credit to all those involved, including the Australian Geoscience Council and its member societies, the IUGS, the geoscientists from around Australia and around the world who have served on the numerous IGC committees, the professional conference conveners, and the geoscientists who have submitted presentations. If you're going to the IGC please take the time to visit the AIG booth and catch up with fellow AIG members..

Kaylen Camuti, President
Australian Institute of Geoscientists



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It covered a surface area of over 120 square kilometres to depths of over 200 metres thick near its source.

Volcanic Ash

Immediately after the June 6th blast, an ash cloud rose to an elevation of about 20 miles. It was then carried by the wind in a easterly direction, dropping ash as it moved. The ash deposits were thickest near the source of the eruption and decreased in thickness downwind.

When the eruption stopped on June 9th, the ash cloud had spread across southern Alaska, most of western Canada and several U.S. states. Winds then carried it across North America. It reached Africa on June 17th.

Although the eruption had these far-reaching effects, most people outside of Alaska did not know that a volcano had erupted. More surprising is that no one knew for sure which of the many volcanoes on the Alaska peninsula was responsible. Most assumed that Mount Katmai had erupted but they were wrong.

Valley of Ten Thousand Smokes

After the eruption, the National Geographic Society began sending expeditions to Alaska to survey the results of the eruption and to inventory the volcanoes of the Alaskan peninsula. Robert Griggs led four of these expeditions.

During his 1916 expedition, Griggs and three others traveled inland to the eruption area. What they found exceeded their imagination.

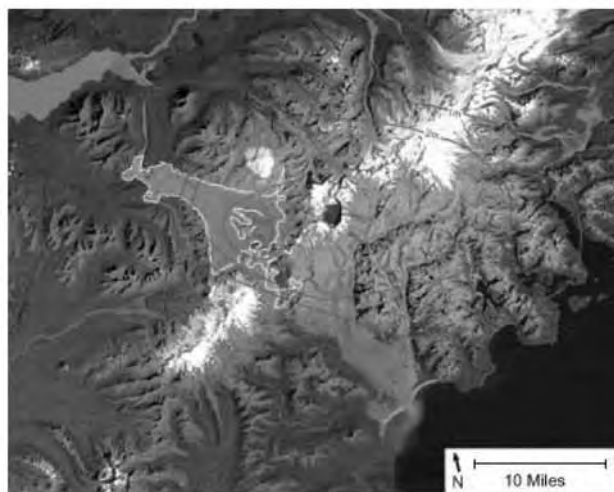


Figure 3. Satellite image of the Novarupta / Katmai area showing the geographic extent of the pyroclastic flow and ash deposit contours. Image by J. Allen (NASA) using data from University of Maryland's Global Land Cover Facility. Cartography by B. Cole, Geology.com. The distribution of ash and the pyroclastic flow confirms that Novarupta - and not Katmai - was the source of the eruption. Medium Resolution 164 KB High Resolution 1330 KB.

First, the valley of Knife Creek was now barren, level and filled with a loose, sandy ash which was still hot at depth. Thousands of jets of steam were roaring from the ground. Griggs was so impressed that he called it the "Valley of 10,000 Smokes" (Figure 4).

Introduction to Regolith Exploration Short Course

CSIRO ARRC Auditorium, PERTH, 19th September 2012, 9am - 5pm

MINERALS DOWN UNDER FLAGSHIP
www.csiro.au



The CSIRO Minerals Down Under Flagship will hold an **INTRODUCTION TO REGOLITH EXPLORATION SHORT COURSE** on Wednesday the 19th of September at the Australian Resources Research Centre in Perth.

Due to significant demand, CSIRO has developed a course aimed at introducing or refreshing people to the types of regolith, potential sampling media and the challenges and opportunities that are available for exploring through cover. People with limited exposure to exploring through the regolith cover in Australia are encouraged to attend. Chief Research Scientist, Dr. Ravi Anand, a world-leader in Regolith Geology and Geochemistry, will guide this short course with support from other experts in this field. All delegates will be provided with lunch, refreshments and a booklet demonstrating important concepts and examples.

Topics will include:

- Terminology and development of weathering profiles
- Regolith landscape processes and implications to exploration
- Regolith mapping and identifying residual and transported materials
- Geochemical sampling media (e.g. soil, lag, laterite, calcrete, saprolite, groundwater, plants and termites)
- Geochemical exploration models

Registration is \$490 including GST, with lunch and refreshments provided. Please contact Felicity Henning (felicity.henning@csiro.au or +61 8 6436 8732) for registration details. Be sure to get in early as places are limited.

\$490

James Hine, a zoologist on the expedition described the location: "Having reached the summit of Katmai Pass, the Valley of Ten Thousand Smokes spreads out before one with no part of the view obstructed. My first thought was: We have reached the modern inferno. I was horrified, and yet, curiosity to see all at close range captivated me. Although sure that at almost every step I would sink beneath the earth's crust into a chasm intensely hot, I pushed on as soon as I found myself safely over a particularly dangerous-appearing area. I didn't like it, and yet I did."

Katmai Caldera and Novarupta Dome

During the eruption a large amount of magma was drained from magma chambers below. The result was a removal of support from beneath Mount Katmai which is six miles from Novarupta. The top several hundred feet of Katmai — about one cubic mile of material — collapsed into a magma chamber below. This collapse produced a crater about two miles in diameter and over 800 feet deep.

Early investigators assumed that Katmai was responsible for the eruption. This assumption was based upon Katmai being near the center of the impact area, Katmai was visibly reduced in height, and early witness accounts thought that the eruption cloud ascended from the Katmai area. Closer observation was not possible and expeditions into the impact zone would be very difficult to accomplish.

The first scientific investigation to get an up-close look at the eruption area did not occur until 1916 when Robert Griggs found a



Figure 4. Valley of Ten Thousand Smokes. Photo taken in 1991 by R. McGimsey, U.S. Geological Survey. The valley was filled with hot pyroclastic debris and emitted steam from thousands of vents for years after the eruption.

2-mile-wide caldera where Mount Katmai once stood. He also found a lava dome at the Novarupta vent (Figure 5). These observations convinced Griggs that Katmai was the source of the eruption.

It was not until the 1950s — over forty years after the eruption — that investigators finally realized that ash and pyroclastic flow thicknesses were greatest in the Novarupta area. This discovery produced a revelation that Novarupta — and not Katmai — was the volcano responsible for the eruption (see satellite image medium resolution, 164 KB or higher resolution, 1330 KB). This is possibly the most important false accusation in the history of volcanic study.

Could Novarupta Erupt Again?

Other large eruptions on the Alaska Peninsula are certain to happen in the future. Within the last 4000 years there have been at least seven Novarupta-scale eruptions within 500 miles of where Anchorage is located today. Future activity is expected because the Alaska Peninsula is on an active convergent boundary.

These large eruptions will have enormous local and global impact. Local impact will include the lahars, pyroclastic flows, lava flows and ash falls that are expected from a volcanic eruption. These can result in a significant loss of life and financial impact. The activity of these volcanoes is monitored by the United States Geological Survey and others so that eruptions can be predicted and their events mitigated.

Large eruptions of Novarupta's scale at high latitudes can have a

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Figure 5. Novarupta Lava Dome marks the source of the 1912 eruption. Image by USGS.

SGC is Australia's leading geophysical consultancy group, specialising in mineral exploration geophysics worldwide.

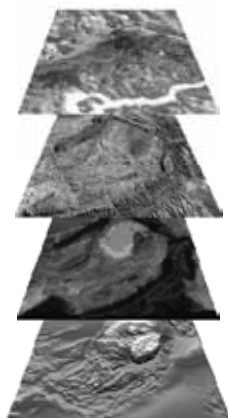
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Figure 6. Image from USGS Fact Sheet-075-98 showing extent of Novarupta ash deposits

significant impact upon global climate. Recent studies have linked high latitude volcanic eruptions with altered surface temperature patterns and low rainfall levels in many parts of the world. The 1912 eruption of Novarupta and other Alaskan volcano eruptions have been linked with drought and temperature changes in northern Africa.

Another significant impact is the distribution of volcanic ash. Figure 2 above shows the ash fall impact areas for five important volcanic eruptions of the 20th century. Augustine (1976), St. Helens (1980), Redoubt (1990) and Spurr (1992) all produced ash falls of significant regional impact. However, Novarupta's ash fall was far greater than any other Alaska eruption in recorded history and contained a greater volume than all of the Alaska eruptions which have been recorded combined.

One of the most important reasons to monitor volcanic eruptions is the potential danger that they present to commercial air traffic. Jet engines process enormous amounts of air and flying through finely dispersed ash can cause engine failure. Impacting the tiny ash particles at high speed is very similar to sandblasting. This can "frost" the jet's windshield and damage external parts of the plane. Before the danger of flying through finely dispersed ash was appreciated several commercial jets were forced to land after sustaining serious damage while in the air. Eruptions the size of Spurr, Augustine, Redoubt and St. Helens can damage jets flying over 1000 miles away. An eruption the size of Novarupta would ground commercial jet traffic across the North American continent.



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Geoconferences (WA) Inc. was incorporated in 1987. This non-profit organisation comprises committed volunteers dedicated to the promotion of geoscience, in particular Precambrian geology, by arranging conferences, symposia and other meetings. Excess funds are used to develop the careers of young geoscientists, mainly through the provision of the JH Lord Travel Grants worth up to \$2,000 for international conferences and \$750 for Australian conferences.

Meetings presented by Geoconferences include Kalgoorlie '93, Kalgoorlie '97 and Kalgoorlie '07, as well as the 3rd, 4th and 5th International Archaeological Symposia in 1990, 2001 and 2010, respectively. Geoconferences also hosted SEG 2004: Predictive Mineral Discovery Under Cover.

www.geoconferences.org



Figure 7. Katmai Caldera was originally thought to be the source of the blast. But about 40 years later the source was finally attributed to Novarupta. Image by USGS.

What Can We Do About It?

People can not prevent this type of eruption. They can assess the potential impact, develop with the possibility of loss in mind, plan a response, educate the public and key decision makers, and monitor the region where it might occur.

The more you know about a natural hazard, the greater your chances of avoiding injury or loss. We are lucky to have this record of the past.

Contributor: Hobart King courtesy geology.com

Surprise Volcanic Eruption in New Zealand

6 August, 2012

Mt Tongariro has erupted, with ash fall closing roads and prompting a potential threat warning for central North Island regions.

The eruption at 11.50pm last night threw rocks and spewed ash from the Te Mari craters, near Ketetahi hot springs, on the northern side of the mountain, GNS Science said.

Civil Defence said volcanic activity could pose a threat to Waikato, Hawke's Bay, Gisborne, Manawatu-Whanganui, Bay of Plenty and Taranaki.

People living in those areas were advised to stay indoors with all the windows and doors closed and listen to the radio for updated emergency information and instructions.

The Desert Road section of State Highway 1, northeast of the mountain, and State Highway 46, to the north, had been closed due to the ash.

Ash had reportedly fallen as far east as Napier, police said.

The eruption had been "really unexpected".

Commentators at Watt's site:

- *Oh, so that's why the last 15 years have cooled. Those retroactive volcanoes are crazy-tough to model.*
- *"People living in those areas were advised to stay indoors with all the windows and doors closed..." Yep, that plan worked real good in Pompeii.*
- *The eruption had been "really unexpected". Twisting 'unexpected' to 'unprecedented & due to global warming' in 3, 2, 1...*

Anthony Watts

(<http://wattsupwiththat.com/2012/08/06/surprise-volcanic-eruption-in-new-zealand/#more-68730>)



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Canary in the Coal-mine of the Western World's Economy

I note that there are an estimated 600 too few exploration geologists in Australia. Some years ago I seem to recall that the AIG Newsletter reported that some 2000 or 3000 out of 5000 Australia geologists had left the industry during the downturn in prices of commodities between about 1994 and 2002.

It is a well-understood black joke that a geological degree is a passport to window-cleaning and driving taxis, a joke that I have heard throughout my 40-year career in geology. Another such joke is that the exploration geologist is the canary in the coal mine of the western world's economy. We seem to take as given that our industry goes through a series of "boom-bust" cycles as the very fickle "free market" changes its ideas overnight about the value of commodities, leaving behind the broken detritus of junior exploration companies and geologists' livelihoods. Whether or not the market can be better self-regulated, or regulated by government as in former communist-bloc companies, is not for debate. However, I would ask first if there is anything that can be done to ensure that our universities do not produce an oversupply of geologists in the "busts", with the consequent waste of skills and knowledge, and an undersupply in the "booms", with the consequent loss of the opportunity for discovery.

The immediate answer seems to be, "No", given that the survival of our university geology departments depends on the sad need to have high numbers of students to maintain an income and therefore retain the necessary core staff of around 9 active geological lecturers for teaching and supervising research students effectively. However, the

medical profession seems rather good at controlling student numbers, and the number of specialists entering that industry, as there are in place a serious number of barriers including entry to the assorted Royal Colleges of specialists, that the medical student has to pass through. The argument for these barriers is that society needs only the best, and those barriers ensure that only the best become doctors.

One could argue the same for all the scientific professions.

However, instead of ensuring that only the best become geologists, we are now looking at down-grading the quality of emerging geologists by offering two-year courses for "associate geologists" to fill the present skills shortage. I do not believe that that essential skill, geological mapping, can be taught properly in two years. Geological mapping is a science, and the geological mapper is a scientist with an eclectic knowledge of the science, capable of thinking in three dimensions, and employing the specialist skills of structural geology, igneous petrology, sedimentology, a sound understanding of geophysics, geomorphology, geochronology and mineralogy, the ability to map metamorphic rocks and volcanic rocks of diverse sorts and to cope with the complexities of granitic, migmatitic and ultramafic terranes, as well as dealing with alteration, mineralisation, basic palaeontology and now the GIS. It is for this reason Australia's geological surveys employ geologists who have demonstrated such a wide range of knowledge and who have proved their capability for thinking broadly as a researcher.

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It may be argued that exploration geology does not need the PhD-level geologist. However, the exploration industry certainly does need geologists with a broad enough background to be able to think outside the box of routine bag-filling and second-guessing geochemical results, or logging core without thinking about its broad implications geologically; in the hands of a skilled prospector the gold pan is indeed an excellent tool, but understanding the regional and local geology in three dimensions, and its possibilities and how to explore them, is certainly more than a mere adjunct to the gold pan. For this, a solid background in the assorted geological disciplines is essential; such a broad background is then improved by several years in the scrub, mapping.

Two years is inadequate to develop the necessary understanding and skills.

This leads me to consider what sort of education is required at secondary level to produce an effective geologist. The foundation of good geology (and any of other scientific career, or of simply being a competent citizen in our complex technological society) is the thorough knowledge and understanding of physics, chemistry, biology and mathematics. The foundation of being able to write competent reports in any endeavour rests on properly taught English grammar and English literature; and Latin (albeit seeming a trifle archaic) provides not only knowledge of our language and early history, but also is an entry into Spanish, Italian and French and perhaps even the linguistic structure of German and Russian, not to mention the grammatical understanding and discipline of the sort that is lacking amongst many bureaucrats, business-people and, these days, a good number of the writers of scientific papers.

That makes 7 subjects to be taught at secondary level. To these I would add an Asian tonal language (which should be started in primary school, when the budding geologist, or even citizen, can learn languages without inhibition and before that part of the brain loses the ability to learn language without effort). That makes 8 subjects; let us add music and art for light relief, for social skills and for further development of the brain, and we have 10. Somewhere along the road we also need to ensure that history and geography are taught, as the future geologist is also a citizen in a society. Those are enough. Geology at secondary level just does not make it, unless the student is encouraged into geology through a school geology club or as a hobby; in the broad societal and indeed global context, learning Arabic, with its concomitant introduction to the understanding of Arabic and adjacent cultures, would be more useful.

Geology, with its vast and demanding scope from the pyroxene to the planets, is taught best as a university-level speciality.

Finally, back to how we exploration geologists may be able to lose our canary status. The time for exploration is not only during a boom period in commodity prices, but also during a downturn in commodity prices, so that the exploration company can take full competitive advantage of the boom that will arrive. This means that exploration geologists need to be retained, doing exploration and mapping as a continuous exercise. In the main, Australia has been mapped geologically at 1:100 000 and 1:250 000 scales, which are good enough to tell us what we don't properly understand about the regional and local geology. Whilst the free market is incapable of providing continuous work for the exploration geologist, a government (and I include as government the dominant party's opposition

partners) with a long-term strategic viewpoint (please don't fall over laughing; I know they are uncommon these days) certainly is.

Australia has state, territory and federal geological surveys; and it has been my experience that the state/territory geological surveys are understaffed, and indeed ageing, with our young geologists preferring the higher incomes now being offered by industry and with federal/state/territory treasuries preferring not to spend money on science, as such work does not yield the instant dollar and nor can treasury recover its cost on a yearly accounting basis through sales of geological information.

It makes sense to me that when the bust produces unemployed industrial geologists, governments could make use of this opportunity to enhance their geological knowledge through contract employment of these unemployed geologists who would carry out targetted mapping and exploration projects that would then enhance the state's prospectivity for the next boom. One can see a very valuable synergy of the varied geological experiences also developing. And it would also maintain a geological work-force with a growing eclectic experience.

It would cost money; but that is why we all pay taxes for the long-term benefit of our society.

Yours sincerely,

RH Findlay

Public Policy Science

Dear Sir.

Applause to Ian Levy for his JORC-like qualification and responsibility statement attached to the recent AIG article. What is required for the stock exchange is surely a minimum expectation for public policy science? The counter report from enquires@csiro.au displays group-think sans responsibility. It is unclear if any scientist was involved in drafting his/her/their response.

Julian Vearncombe

More Letters Overleaf



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AIG Representation and Advocacy at a Personal Level

Dear Kaylene,

I refer to your letter dated 11th June 2012 included with my AIG membership renewal.

In your letter you invite comment regarding geoscience issues that concern me, and to provide feedback on improved AIG services to members. My concern and suggested improvement is to do with AIG advocacy, but not advocacy on national and international issues you mention in your letter, rather, representation and advocacy at the individual, personal, professional level.

I believe that the Institute should provide advice and representation to individual members to help resolve employment and contractual conflicts a member may experience with their employer. Conflict, harassment or intimidation may, for example, be as a result of pressure from the employer for the signing off by the member of a dishonest report – and yes I realise we should all have the gumption to say “no”, but this is not always so easy for some without legal or moral support.

Also, many of us, particularly those working prior to the late 1990's must have experienced termination and redundancy; many later entrants to the mining industry will also invariably experience job loss completely outside of their control sooner or later. I think unbiased termination and redundancy advice, alternative advice to that offered by the employer during the termination process, should be provided to members by the AIG upon request from a member.

Tips on structuring an employment contract may also be handy for some members.

I acknowledge that personal industrial relations advice is available via legal counsel, but to the individual the cost of legal advice can be prohibitive. Perhaps the AIG could retain such legal or industrial relations counsel for the benefit of the membership. Perhaps the Institute already offers such a service?

Employment as a geoscientist can be fickle; jobs come, and jobs go, employment continuity is often out of our control. In the past I've accepted redundancy terms from my employer on face value – and perhaps those terms were correct, but I didn't know that for sure and accepted terms as presented; where could reliable advice be found anyway?

At the very least AIG should be able to direct members to unbiased, personal, professional advice to do with industrial relations, employment contracts and termination – perhaps the AIG does provide such advice, though it hasn't been obvious to me during the 18 year term of my membership.

My core suggestion in all this is that the AIG provide personal, professional advice at a manageable cost to the individual; if such service is already provided then it be clearly promoted to the membership. I suggest AIG leave national and international advocacy to corporations, billionaires or AMEC but instead focus AIG advocacy at the personal, individual level.

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By the way, and on a completely different topic, where might I find a copy of the AIG Articles of Association? I could not find them on the AIG web site despite logging in as an AIG member and doing a word search.

Finally, I wish to extend my sincere gratitude to you, Councillors and all the fabulous volunteers that make AIG the dynamic institution it has become.

Cheers!

David Thomas, MAIG

Dumbing Down of Standards

Hello Louis

The lead article on “Skill Shortage in the Mining Industry” and the article on “Draft Senior Secondary Curriculum - Earth and Environmental Science” published in the AIG News, May 2012 appear to have a common thread involving a “dumbing down” in the standards of the geological sciences. The “dumbing down” of standards should come as no surprise to many members who have experienced the mineral cycles over their careers. University teaching staff and course contents have also been subject to the mineral cycle fallouts as much as the fallouts affecting industry employed geoscientists. During mineral cycle busts no one contemplates the recovery effects in the next mineral cycle boom believing all will return to good times. Unfortunately unless strategies are in place for the next boom the current scenario will eventuate as it has happened in past booms. The current boom gathered pace from 2003 after the disastrous bust period of 1997 – 2002 decimating the ranks of geoscientists. However the current boom is unprecedented in its demands on labour involving many commodity projects. Labour costs have soared as a direct result of normal supply and demand economics and now threaten the start up of many projects. The “who wants to be a millionaire?” song is now being sung by most mine workers (including geologists of whatever experience level) being lured into jobs paying more than \$100,000 pa.

Field geologists have become a “rare and endangered species” necessitating the training of partly trained “quasi” geologists as outlined in the lead article. The high school education system’s view of geology as a non science will be reinforced by employment of “quasi” geologists. Universities have had a hand in the “dumbing down” process by allowing students to bypass traditional compulsory maths, physics and chemistry units in their courses to obtain a BSc major in geology. Professional associations (AusIMM and AIG and others) should engage government, universities, industry associations and the ASX to formulate a plan to combat the “dumbing down” of the geological sciences.

If we all “sit on our hands” and do nothing then we should not complain about the outcomes of doing nothing.

Denis J Rafty MAIG

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Science Held Hostage in Climate Debate

Garth Paltridge

Published: Australian Financial Review, 22 Jun 2012

THE BROAD THEORY of man-made global warming is acceptable in the purely qualitative sense. If humans continue to fill the atmosphere with carbon dioxide, there can be little doubt that the average temperature of the world will increase above what it would have been otherwise. The argument about the science is, and always has been, whether the increase would be big enough to be noticed among all the other natural variations of climate. The economic and social argument is whether the increase, even if it were noticeable, would change the overall welfare of mankind for the worse.

Attempts to resolve the arguments are plagued with problems, a lot of which are inherently insoluble. There are many aspects of the behaviour of the natural climate system and of human society that are unpredictable in principle, let alone in practice. But perhaps the biggest of the underlying problems, and it is common to both arguments since it inevitably exists when there is large unpredictability and uncertainty, is the presence of strong forces encouraging public overstatement and a belief in worst-case scenarios.

From the social and economic side of things, one might take much more notice of the global warming scare campaign if it were not so

obvious that many of its most vociferous supporters have other agendas. There are those, for instance, who are concerned with preservation of the world's resources of coal and oil for the benefit of future generations. There are those who, like the former president of France, Jacques Chirac, speaking at a conference on the Kyoto protocol in 2000, look with favour on the possibility of an international decarbonisation regime because it would be a first step to global governance (the president's actual words were "For the first time, humanity is instituting a genuine instrument of global governance".) There are those who, like the socialists of the 20th century, see international action as a means to force a redistribution of wealth both within and between the individual nations. There are those who regard the whole business mainly as a path to the sort of influence which, until now, has been wielded only by the major religions. More generally, there are those who, like the politically correct everywhere, are driven by a need for public expression of their own virtue.

Of course there is nothing wrong, or at least not much that is wrong, with the ideals behind any of the above agendas except perhaps the last couple on the list. But the battles over them should be fought in the open and on their own merits rather than on the basis of a global warming crusade whose legitimacy is founded on still-doubtful science and on massive slabs of politically correct propaganda.



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EXPLORATION GEOLOGISTS

It is generally assumed that climate scientists themselves are more or less united on the matter and are not pushing a global warming barrow because of their interest in some other agenda. Certainly this is the story the activists would have us believe.

To the extent that there is such a thing as normal science, it relies upon accurate observations to verify its theories. Accurate is the operative word here. Climate research has to rely on spectacularly inaccurate data from information on Earth's past climate. Even though there are vast amounts of atmospheric and oceanographic data to play with, together with lots of proxy information from tree rings and ice cores and corals and so on, abstracting a coherent story from it all is something of a statistical nightmare. It gives a whole new meaning to the old saying "lies, damn lies and statistics".

Suffice it to say that climate science is an example of what Canadian educator Sue McGregor calls "post-normal science", in which "the facts are uncertain, values are in dispute, stakes are high and decisions are urgent". In such circumstances it is virtually impossible to avoid subconscious cherry-picking of data to suit the popular theory of the time. Even Isaac Newton and Albert Einstein were not immune from the problem. In their case they were of sufficient genius (and were sufficiently lucky!) for their theories ultimately to trump the inaccuracy of the observations they had selected. Other scientists are rarely so prescient or so lucky. In the modern era, the problem is compounded by the existence of vastly complex computer models that can be tuned, again more-or-less subconsciously, to yield the desired result. From theory to observation and back again – if we are not careful, the cherry-picking can go round and round in an endless, misleading loop.

But the real worry with climate research is that it is on the very edge of what is called postmodern science. This is a counterpart of the relativist world of postmodern art and design. It is a much more dangerous beast, whose results are valid only in the context of society's beliefs and where the very existence of scientific truth can be denied. Postmodern science envisages a sort of political nirvana in which scientific theory and results can be consciously and legitimately



Scientist Garth Paltridge says politicians need to have access to diverse advice on the science of climate change. Photo: Rob Homer

manipulated to suit either the dictates of political correctness or the policies of the government of the day.

There is little doubt that some players in the climate game – not a lot, but enough to have severely damaged the reputation of climate scientists in general – have stepped across the boundary into postmodern science. The Climategate scandal of 2009, wherein thousands of emails were leaked from the Climate Research Unit of the University of East Anglia in England, showed that certain senior members of the research community were, and presumably still are, quite capable of deliberately selecting data in order to overstate the evidence for dangerous climate change. The emails showed as well that these senior members were quite happy to discuss ways and means of controlling the research journals so as to deny publication of any material that goes against the orthodox dogma. The ways and means included the sacking of recalcitrant editors.

Whatever the reason, it is indeed vastly more difficult to publish results in climate research journals if they run against the tide of politically correct opinion. Which is why most of the sceptic literature on the subject has been forced onto the web, and particularly onto web-logs devoted to the sceptic view of things. Which, in turn, is why the more fanatical of the believers in anthropogenic global warming insist that only peer-reviewed literature should be accepted as an indication of the real state of affairs. They argue that the sceptic web-logs should never be taken seriously by "real" scientists, and certainly should never be quoted. Which is a great pity. Some of the sceptics are extremely productive as far as critical analysis of climate science is concerned. Names like Judith Curry (chair of the School of Earth and Atmospheric Sciences at the Georgia Institute of Technology in Atlanta), Steve McIntyre (a Canadian geologist-statistician) and blogger Willis Eschenbach come to mind. These three in particular provide a balance and maturity in public discussion that puts many players in the global warming movement to shame, and as a consequence their outreach to the scientifically inclined general public is highly effective. Their output, together with that of other sceptics on the web, is fast becoming a practical and stringent substitute for peer review.

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Science Held Hostage in Climate Debate

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Climate science has transformed itself from a research backwater a few decades ago into one of the greatest public-good scientific cash cows ever devised. In Australia, for instance, there is a separate federal Department of Climate Change and Energy Efficiency specifically devoted to implementing (buying?) the social change required to limit global warming. The livelihood of many of the climate scientists within the CSIRO and elsewhere is now dependent on grants from that department. It is not a situation conducive to sceptical outlook and balanced advice. When a tendency toward postmodern science is mixed with a single, generous and undoubtedly biased source of money, it is not surprising that things can go very wrong very quickly.

This has all come about largely because government laboratories these days are required to earn a goodly fraction of their operating income from external sources – this even when their activity is public-good research for which there is not a private market. The requirement inevitably encourages the emergence of activist-scientists who are not overly concerned about sliding into the realm of postmodern science.

In the particular case of CSIRO for instance, the encouragement starts with a formal mission statement to the effect that CSIRO seeks to achieve “a profound and positive impact on the most significant challenges and opportunities facing Australia and humanity”. Good stirring stuff of course, except that “impact” can get translated to “influence” in the reviews of its scientific programs, and the mission

statement can be interpreted as justification for devoting a large fraction of overall scientific resources to the business of creating a market for one’s scientific advice.

As one organisation after another jumps, or is pushed, into producing public assessments of the climate change issue, we see the same small group of activist-scientists in the background. We see them providing briefings to federal and state politicians. We see them as primary advisers to supposedly independent organisations such as the Australian Academy of Science. We see them involved in programs to introduce school children to the dangers of a carbon footprint. Generally we see them in what agricultural science used to call extension activities – although in the case of climate change much of the extension effort is devoted to convincing the various audiences that there is indeed a problem worth doing something about.

No doubt these scientists genuinely believe in their own perception of the climate change story. But why do mainstream scientists go along with the inevitable overstatement associated with the activism business?

One factor is a form of loyalty to colleagues. Another, bearing in mind the singular nature of the funding source, is the need to eat. But mostly it gets back to the uncertainty of the science. The typical climate researcher is reluctant to go public with contrary opinion not backed by something very close to real proof. And there is very little real proof on either side of the climate change story. Contrary opinion in an era where postmodern science is almost respectable can be dangerous to a research career.

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The bottom line of all this is that deliberate understatement of the uncertainty of the science allows overstatement of the climate change problem. In the early days of the debate – back in the '70s and early '80s, before the whole issue became highly politicised – scientists were quite happy to admit to the uncertainty.

As a consequence, there was a philosophy around the traps at the time to the effect that, if nations really wanted to do something drastic and expensive about global warming, then the sensible course would be to take only those actions which would also be worth doing for other reasons. Improving the efficiency of transport would be sensible for instance. Burying vast quantities of carbon from the smokestacks of power stations would not.

That philosophy soon got lost in the politics. It is mildly encouraging now, perhaps as a result of the Climategate scandal, that we are beginning to see a new generation of climate scientists look again with a properly jaundiced eye at the question of uncertainty and how it might be assessed.

It is not surprising that society's opinion on what to do about climate change is highly polarised. There are passionate and vocal supporters on both sides of the argument as to whether global warming will be disastrous.

It is a bit surprising that what seems to be a roughly 50/50 split of public opinion is not at all a reflection of the much vaunted consensus of the climate science community. Perhaps this says a lot for the commonsense of the person in the street. In any event, the complexity of the issue, and the vast scale of the resources required to solve the problem (if there is a problem), make it difficult for middle-ground argument to be heard.

All of which makes it very hard for politicians to make sensible decisions on the basis of some reasonable balance of probability. One can but wonder at the prescience of former US president Dwight D Eisenhower in his farewell address to the nation in 1961: "Yet, in holding scientific research and discovery in respect, as we should, we must also be alert to the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite."

Suffice it to say that there is a need for politicians to have access to a real diversity of advice on the science of climate change. In this country, and in most Western countries, the sources of advice are highly inbred.

It would seem important also that any political and economic action on the matter of global warming should be flexible enough to be changed, or indeed discarded, should there be a significant shift in scientific or public perception. In terms of practical politics, the government of the day needs to give itself future wiggle room by making it clear to everyone that it is indeed making decisions on the basis of a fluid balance of probabilities, rather than on what activists insist is a scientific and economic certainty. ▲▲

Author Bio: Garth Paltridge is an emeritus professor with the University of Tasmania, a visiting fellow at the Research School of Biology at the Australian National University and a fellow of the Australian Academy of Science. He is the author of The Climate Caper: facts and fallacies of global warming, Connor Court, 2009. He was a chief research scientist with the CSIRO division of atmospheric research.

Coal Slag Heap Designated World Heritage Site

UNESCO has added France's Nord-Pas de Calais Mining Basin to its World Heritage Listing.

The mining pit, worker's quarters and the slag heap join the Chinese Great Wall and Australia's Great Barrier Reef as environmental heritage icons though a closer reading of the UNESCO announcement suggests its heritage listing might have more to do with politics of workers' rights and conditions, than any redeeming environmental value or significance.

Coal mining started from the 1700's (the Little Ice Age probably having some bearing) to the 1900's. The site includes various mining pits and shafts, slag heaps, some of which cover 90 hectares and rise over 140 metres in height, railway infrastructure, workers estates, mining villages etc. The site is regarded as a testimony to the creation of model workers cities from the middle of the 19th century to the 1960's, showing the workers living conditions and the solidarity to which it gave rise. For those who like to read UNSpeakalese, the following turgid "brief synthesis" might be of interest:

"The Nord-Pas de Calais Mining Basin corresponds to the French part of the northwest European coal seam. On a broad open plain, it extends some 120 km, through the two administrative departments of Nord and Pas-de-Calais. It presents a remarkable cultural landscape in terms of its continuity and homogeneity. It provides an important and well preserved example of coal mining and its associated urban planning throughout the two centuries of intensive coal extraction from the end of the 18th century to the last quarter of the 20th century, through industrial methods involving a great many workers. This succession of landscapes resulting from the virtually mono-industry of coal extraction includes: physical and geographic components (slag heaps, farmland, mining subsidence ponds and woods), a mining industrial heritage (pit heads, residual industrial buildings and headgear), vestiges of transport equipment, the so-called 'cavaliers', (canals, railways, conveyors), worker housing and characteristic urban planning (mining villages, garden cities, detached housing estates and tenement buildings), monumental and architectural components testifying to community life (churches, schools, managers' châteaux, company head offices, worker union premises, stations, town halls, hospitals and clinics, community halls and sports facilities), and finally places of remembrance and celebration of the Basin's history and its miners."

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Report from the Australian Geoscience Council

The incumbent President, Dr. Neil Williams, reviewed the accomplishments of the Australian Geoscience Council (www.agc.org.au) during the past 12 months in his report to the Annual General meeting in June 2012. The following text details the key activities of the AGC during 2011/12 as reported to the AGC AGM.



Introduction

2011-2012 has been another prosperous year for the energy and mineral resource sectors of the Australian economy, unlike the other parts of the economy that are slowing in response to continuing concerns about the state of the global economy, particularly in the Euro-zone component. As this Annual Report is being written, some pessimism is beginning to creep into the Australian resource sector due to a number of factors. These include a possible slowing down of growth in the Chinese economy, the introduction of the Carbon Tax in July 2012, recent Federal Government antipathy towards mining and petroleum companies, labor shortages that are slowing planned projects, and infrastructure bottlenecks that are threatening Australia's international competitiveness.

Despite these concerns, there remains a strong demand for geoscientists in not only the resources industry, but also in the public sector where geoscientists are not only needed for resource-based activities, but also for environmental, engineering, water and hazard management.


34th International Geological Congress (IGC)

The IGC is the major focus of AGC activities and promises to be the biggest and most impressive geoscience event ever seen in Australia. As the Australian Geoscience Council is the legal entity for the Congress, the work of the Council over the last year has become increasingly focused on ensuring that the Congress is successful, both financially and scientifically. Details are available at www.34igc.org.

With only 60 days left to the Congress we now have for the first time a good indication of the size and content of the Congress. Author registration closed on 31st May and 3168 authors had registered by that date. Total registrations now stand at 4856 indicating the final number of registrants at the Congress will be in the low 5000's. This outcome is well above the Council's initial estimates and, provided the IGC budget is carefully managed over the next 2 months, we can anticipate a good financial outcome. As well as a diverse and interesting scientific program having an emphasis on Australian resources, the Congress will also have a large and vibrant exhibition featuring 129 exhibitors from universities, companies and government agencies from around the world, and a range of pre- and post-congress field excursions that will showcase Oceania's amazing geological features. With the scientific program about to be released, all Australian geoscientists are encouraged to examine the wide range of exciting and relevant presentations over the 5-day event and to make the decision to attend.


A lot of work has gone into reaching this positive point in the almost-decade long history of the 34th IGC and I would like to thank all the numerous members of the Organising Committee and of its various subcommittees for all their efforts to make the IGC a reality. While reluctant to single out individuals for special mention, the President did acknowledge the huge effort being put in by IGC Secretary General Ian Lambert, the IGC Deputy Secretary General Paul Kay, and the IGC Treasurer Miriam Way. The AGC also appreciates all of the efforts of our Professional Conference Organiser – Carillon Conference, led by Ashley Gordon. Ashley and his colleagues have been successful in obtaining the majority of our Congress sponsorship, which now totals a little under \$1million in value, and they have driven a long but fruitful IGC promotion effort. Their advice and conference administration experience is proving invaluable and will be critical during the last hectic days leading into the Congress itself.

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EVENT	TYPE	DATE	NO.OF DAYS	BY	VENUE	STATUS
Mine visits Au, Fe, Ni	Field trip	20.09.12	4	GSWA + assistants	Perth -> Kalgoorlie	Limited places Deadline 31/8
Porphyry Copper	Short course	21.09.12	1	Dick Tosdal + Scott Halley	Perth	Early registration recommended
Up-skilling workshop	Field workshop	24.09.12	2	Gerard Tripp + Julian Vearncombe	Kalgoorlie	Full
Super-pit	Mine visit	24.09.12	1	KCGM	Kalgoorlie	Limited places
Gold mines	Mine visits	24.09.12	1	Integra	SE of Kalgoorlie	Limited places
Ni and Ag mines	Mine visits	25.09.12	1	Independence + MacPhersons	Kambalda + Kalgoorlie	Limited places
Greenstone Belts	Conversation	25.09.12	Early Evening	Howard Poulsen	Kalgoorlie	Full
Structural Geology and Resources	Symposium	26.09.12	3		Kalgoorlie	Early registration recommended
Women in Mining	Breakfast	27.09.12	Early Morning	Heather Carey, Women in Mining + Cliffs	Kalgoorlie	Invite to female symposium participants
Non-linear, non-equilibrium	Short course	29.09.12	1	Bruce Hobbs + colleagues	Kalgoorlie	Early registration recommended
Yilgarn Transect	Field trip	29.09.12	5	GSWA + assistants	Kalgoorlie -> Perth	Limited places Deadline 31/8

2013

EVENT	TYPE	DATE	NO.OF DAYS	BY	VENUE	STATUS
JORC + N143-101	Workshop	25.05.13	1	CSA Global + AIG	Bali	
Epithermal + Carlin Gold	Workshop	26.05.13	1	Steve Garwin + Noel White	Bali	
East Asia: Geology, Exploration Technologies and Mines	Symposium	27.05.13	3		Bali	
Exploration Geochemistry	Workshop	30.05.13	2	ioGlobal	Bali	
Structural Geology and Resources	Workshop	30.05.13	2	SJS Resource Management	Bali	

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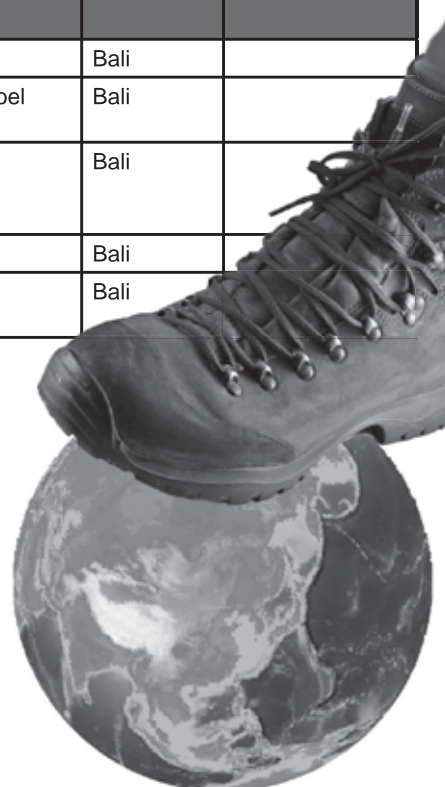
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Report from the Australian Geoscience Council

Cont. from Page 15

The AGC Video Series Promoting Australian Geoscience

Building on the AGC Touring Speaker idea developed last year, the Council took a decision during the year to embark on the development of a series of educational and promotional videos under the theme of "Geoscience in Australia".

The first of these was recorded on 19th January 2012. The presenter was Professor Geoffrey Blainey and he spoke on the subject of how Australia, past and present, has been shaped by mineral discoveries. Prof Blainey is a most engaging and interesting speaker and he was very ably supported by well-known media personality Peter Couchman who introduced the video and asked lots of interesting questions during the relaxed and informal presentation. The video is an excellent introduction to Council's video series and can be viewed at: www.agc.org.au/index.php/geoscience-in-australia. The video will also be aired in the Geotheatre at the 34th IGC, along with many other videos of interest to a wide range of geoscientists. During the presentation Professor Blainey touches on a number of themes that the Council hopes to develop in more detail in subsequent recordings.

AGC Newsletter GeoEdLink

(www.geoed.com.au/AGCnletter/archive.html)

In May the Council reappointed Greg McNamara to the position of Editor of the AGC e-newsletter GeoEdLink. Greg continued his excellent work in producing GeoEdLink, with 3 editions released in 2011 and one to date in 2012, all containing valuable educational resources for high school science teachers as well as interested members of the public.

Australian Curriculum, Assessment and Reporting Authority (ACARA)

Following a lot of activity with ACARA last year, little has taken place this year. However the Council was advised by ACARA on 10th May this year of the release of the draft senior secondary Australian Curriculum for English, Mathematics, Science and History, and we have been invited to comment on the draft, which can be viewed at: <http://consultation.australiancurriculum.edu.au/>. The draft is open for discussion until 20th July 2012 and the Council, through Past President Michael Leggo, will be providing comments on the document.

The Australian Learning and Teaching Council

Just after Dr Williams was elected President of the AGC, he became involved in a committee entitled the "Science Discipline Reference Group" that was a part of a project being undertaken by the Australian Learning and Teaching Council investigating Learning and Teaching Academic Standards for Science (LTAS) across Australian universities. The Geosciences were also represented by Dr Ian Fitzsimons, from Curtin University. Ian focused his attention on the learning and teaching side university science standards while Dr Williams' focus was on the employer's side. Unfortunately, just as LTAS initiative was getting somewhere the Federal Government shut it in early 2012. However all was not lost as Ian Fitzsimons continued the good work of the Group through a university geoscience initiative called Geoscience Learning and Teaching. The Council agreed to support Ian's work in April 2012, which is now being progressed with the support of a small group of volunteers from member Societies. This committee will follow the guidelines provided by a recently created Australian Government agency called the Tertiary

Educational Quality and Standards Agency (TEQSA) that is continuing the work begun under LTAS, with the aim of establishing standards for tertiary Earth Science teaching.

Teacher Earth Science Education Program (TESEP)

The AGC made a one-off contribution to TESEP to support two activities. The first is enhanced promotion and accessibility to TESEP as it moves into Stage 2. The second is support for the development of excursion descriptions to enable the ESWA Year 11 and 12 earth Science text book to be used as a national text. TESEP is strongly supported by many of the AGC member societies and we encourage the continuation of that support.

International Earth Science Olympiad (IESO)

The AGC provided financial assistance to four high school students to help them to represent Australia at the IESO held in Italy. The students provided a report on their experience for inclusion in society newsletters.

Concluding Remarks


In closing his report Dr. Williams expressed his thanks to the Past President Michael Leggo, the Chairman Mike Smith, the Secretary Brigitte Hendersonhall and the team at the AusIMM, who manage all the Council's financial affairs. ▲▲

Dr. Neil Williams PSM

Honorary Professorial Fellow, University of Wollongong
President, Australian Geoscience Council

President, 34th International Geological Congress, Brisbane, 2012

Members of the Australian Geoscience Council include the following bodies: Association of Applied Geochemists, Australasian Institute of Mining and Metallurgy; Australian Geoscience Information Association; Australian Institute of Geoscientists, Australian Society of Exploration Geophysicists, Geological Society of Australia, International Association of Hydrologists (Australian Chapter) & Petroleum Exploration Society of Australia.



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JORC Workshop – Reporting Exploration Results

The AIG and AusIMM held a thought-provoking workshop on Exploration Reporting under the JORC Code in Sydney on 9 May 2012. The workshop was held at the Royal Exchange and was booked out with more than 80 people attending. The presentations were interesting and discussion was active and enlightening.

Steven Hunt from JORC gave us a rundown on the Code emphasising transparency, materiality and competence as its foundations. He pointed out that exploration results must allow a considered and balanced judgement by investors and emphasised that the disclaimers in any presentation nowadays should be legible (not font size 4) and not flashed past at the speed of light. JORC is currently reviewing the Code and plans to release a draft mid year for public comment.

Cameron Bill from the Australian Securities Exchange (ASX) reviewed the most common infringements including: a missing or deficient CP statement, incorrect use of historic resources or reserves terminology (at this stage you require an ASX waiver to quote historic resources or reserves), insufficient information especially drill hole data, exploration targets stated incorrectly with no proximate cautionary statement. Diane Lewis, a Senior Policy Analyst for the ASX then gave us a summary of where the ASX, is heading with reporting requirements following the recent review of submissions. ASX is considering removing the need for a CP to sign off on subsequent announcements as long as there are no material changes and there is a cross reference to the original CP signoff and



Left: Sue Border from Geos Mining, and above, Cameron Bill from ASX

a possible requirement for a fully completed JORC Code Table 1 for 'material project' announcements. Consideration is also being given to set up a panel of experienced professionals to review announcements that ASX officers believe to be in breach of the Code.

Sam Lees gave a brief review of the complaints procedure for AIG



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Right: Diane Lewis from ASX



Below: Phil Hellman from H&S Consultants



and AusIMM. If you see an example of poor reporting, say something to your professional institute. If we don't maintain a standard then an onerous one will be put upon us.

Phil Hellman has hidden talents as an over-optimistic MD attempting to break a record for the maximum number of JORC Code breaches in one presentation — he gave an extremely funny example of a JORC-ugly presentation with approximately 40 infringements of the Code. This presentation highlighted the major issues in exploration reporting including the use of words such as 'JORC approved', 'JORC controlled'; resource tables labelled as 'JORC Resources' with no grades, just metal equivalents; confusion with categories of Resources and Reserves; the ripper gold grade of 24.4% from a panned concentrate (!); an increase of 900% in a resource with no additional drilling because the definition of a resource including 'reasonable prospects for eventual economic extraction' had been ignored; misleading use of exploration target tonnages, metal equivalents; and incorrect CP statements.

Sue Border gave some examples of blatantly misleading statements from some recent reporting including accuracy implied by figures quoted to too many significant figures, exploration results being reported for elements of no commercial interest, misuse of metal equivalents, and a general lack of transparency or omission of information which would be significant to investors.

Overall, the main points brought out in discussions were:

- The industry needs to get its act together to ensure that reporting is done correctly, or we will end up with a "tick the box" approach.
- A revised version of the JORC Code will be circulated in draft mode by the end of 2012. This version aims to address problem areas, remove ambiguity and increase guidance to facilitate transparency and consistency.
- There was strong support for education initiatives to improve JORC compliance, particularly for younger professionals. Seminars were recommended when the revised JORC Code is implemented
- Clause 18 of the JORC Code (discussion of exploration target size and type) needs to be improved or clarified, ensuring that the statement of uncertainty is proximate to the statement of exploration target.
- Adoption of CRISCO terms and definitions will be included in the forthcoming review of the Code.
- "Mistakes" in resources announcements occur far too often. The ASX does not have the resources to thoroughly check all announcements before they are posted (although the TSX, which deals with many more announcements, does). Industry + ASX to look at forming a "panel of experts" to check statements to ensure that they are compliant with the Code and to review complaints about non-compliant statements.
- Complaints about CPs to go to AIG/AusIMM. Complaints about companies to go to the ASX.

All in all a useful workshop. We'll probably hold another one on Resource and Reserve reporting after the release of the amended Code later in the year. ▲▲

Wendy Corbett/Sue Border



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The United Nations Conference on Sustainable Development (UNCSD) — Earth Summit Rio+20

IUGS Position Statement

The United Nations Conference on Sustainable Development (UNCSD) or Earth Summit Rio+20, held from 20 to 22 June 2012 in Rio de Janeiro, Brazil, takes place twenty years after the 1992 United Nations Conference on Environment and Development (UNCED), where countries adopted Agenda 21, and ten years after the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg.

These goals are in agreement with those of the International Union of Geological Sciences (IUGS), which include: (a) promoting development of the earth sciences through the support of broad-based scientific studies relevant to the entire earth-system, and (b) applying the results of these and other studies to preserving Earth's natural environment, using all natural resources wisely, and improving the prosperity of nations and the quality of human life.

The International Union of Geological Sciences (IUGS) is an international scientific, non-governmental, non-political, and non-profit-making organization, with 121 National Committees representing the international earth sciences community and almost 50 affiliated organizations of world wide scope covering all fields of expertise in the earth sciences, plus several commissions and task groups involved in specific fields, such as geological education training and technology transfer, geoethics, management and application of geoscience information, geoscience in environmental

management, and standards in geosciences. All these are directly relevant to the two main themes on which Rio+20 will focus the official discussions: a) a green economy in the context of sustainable development, and poverty eradication; and b) the institutional framework for sustainable development.

The future of our planet is determined not only by anthropogenic influences but also by long term exogenous and endogenous natural processes, often accompanied by natural disasters beyond human control. The most significant of these events are often beyond the reach of human memory. Only Earth and Space sciences are able to serve as mediators for any research needed in detecting the behaviour and predictability of such phenomena. In the light of this knowledge, it seems necessary to modify the mostly oversimplified ideas about environment sustainability, by an appropriate geoeducation and by a geoethical approach. It is necessary to realize that the so-called 'abiotic nature' has its own dynamic evolution and that its regularities and laws need to be known and understood in order to improve any forecasting and mitigation of important catastrophes and climate changes.

It is therefore opportune and necessary for the IUGS to expose its views on the different matters to be considered during the Rio+20 summit. Moreover the seven areas which need priority attention, as highlighted during the preparations for Rio+20, i.e. jobs, energy, cities, food, water, oceans, disasters, are all within the scope of IUGS

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interest and activities and have components directly bearing on Earth science knowledge and expertise. The documents resulting from this summit should therefore include provisions, as those outlined below, to promote the geoscientific research and knowledge that is needed to achieve a safer, more equitable, cleaner, greener and more prosperous world for all.

Green Jobs

The international geological community and the IUGS are committed to promote and increase the creation of green jobs in the Earth sciences world-wide, in agreement with Millennium Development Goal 1. Geological education at the University level has been undergoing important changes to increase the number of professionals working on matters related to environmental issues. At the same time IUGS activities have been focused on promoting Earth science for environmental management and sustainable development, along with Earth science education and capacity building with participation of developed and developing countries, especially through a joint IUGS-UNESCO International Geosciences Programme (IGCP).

Energy

Geological knowledge is fundamental to the provision of energy at present and probably for several decades to come, as it comes primarily from fossil sources (oil, gas, coal, methane hydrates, and

also uranium). But geological knowledge is also essential for the mitigation of the environmental impacts due to exploration and production, and more substantially, for moving to a lower carbon and finally to a renewable energy system. Renewable energy from water (river and sea) power, geothermal, biomass, carbon capture, as well as underground energy storage are based on conditions studied by geology.

Sustainable Cities

Urban geological work is essential for city planning, construction, safety and management, including water supply, waste disposal, and improving the resilience of cities to natural disaster risks.

Food Security and Sustainable Agriculture

The geosciences are essential for land-resource surveys to establish the location, extent and severity of land degradation and desertification, to prepare and implement programmes leading to the rehabilitation of degraded lands, to the conservation of soil fertility, and to groundwater, and watershed management. All needed for sustainable agricultural development.

Water

Geological studies are essential for provision, assessment, protection and sustainable management of water resources, to maintain water quality and aquatic ecosystems. All these elements are necessary to guarantee access to safe drinking water and provision of water for sustainable food production and rural development, as established by Agenda 21, the Millennium Declaration and the Johannesburg Plan of Implementation.

Oceans

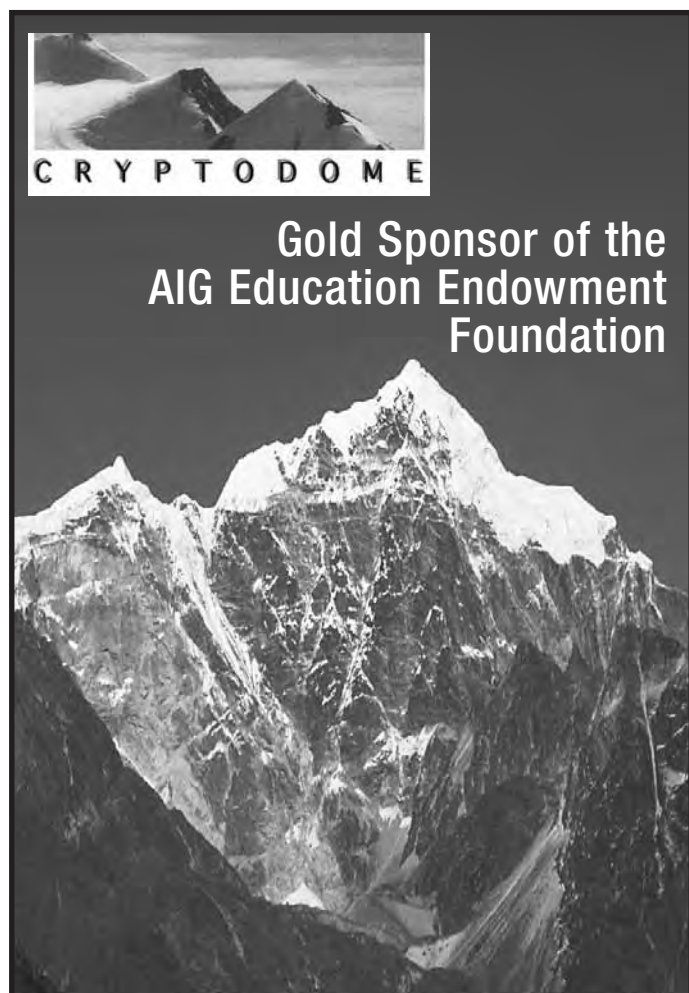
The geological study of the oceans, focused on the geological structure and topography of the ocean floor and the natural processes that create and modify these features, is essential to many basic tenets of the Human environment, such as the study of past climate change for environmental prediction, to understand the impact of benthic habitat on biological communities, and to learn more about how the Earth and its environmental systems function. In addition to the fact that geological studies are essential to the work being carried out by the Commission on the Limits of the Continental Shelf under the 1982 United Nations Convention on the Law of the Sea (UNCLOS)

Disaster Readiness

Geological hazards include internal Earth processes, such as earthquakes, volcanic activity and emissions, and other related processes such as tsunamis, mass movements, landslides, rockslides, surface collapses, and debris or mud flows. Therefore, knowledge of geological process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption or environmental damage is basic for disaster readiness.

Alberto C. RICCARDI, President IUGS

For the latest in Geoscientist news, views, codes, events, employment and education visit the AIG website:
www.aig.org.au



AIG Council 2012 – 2013

The AIG Council for 2012 – 2013 was elected in May. Here are brief profiles introducing the AIG Councillors for this year.

Andrew Watho

During his career Andrew has worked for several mid-tier and major mining exploration companies, as well as a consultant in his own practice and with several major, international consulting firms, where his work spanned a number of commodities, both in Australia and overseas. He is currently Chief Geologist – Energy and Minerals with Rio Tinto Exploration's Project Generation Group with responsibilities covering energy and industrial mineral exploration and development projects globally which require interactions with resource industry professionals working in a wide range of other disciplines on a daily basis.



Andrew is a Fellow of both AIG and AusIMM, a Registered Professional Geoscientist (RPGeo) and a past president of AIG. Andrew has been an AIG Councillor and member of the Queensland Branch committee for a number of years. He is actively involved in building AIG's relationships with other organisations representing professional geoscientists internationally in response to the increasingly global nature of geoscientific practice, particularly in the

exploration and mining industry and standards of professional practice for the reporting of exploration results, mineral resource and ore reserve information to the public. He also has an active interest in building the public understanding of the broad role of geosciences in the community at large.

Anne Tomlinson

Anne Tomlinson (formerly Morrell) graduated from the University of Auckland in 2002 with a Bachelor of Science in Geophysics and Bachelor of Arts in German and followed with an MSc in Economic Geology and Applied Geophysics in 2004.



Anne began her professional career as a graduate geologist in near-mine exploration for gold in North Queensland, followed by a mine geology role in the northern Yilgarn, Western Australia. She returned to exploration geophysics and has been working at Southern Geoscience Consultants based in Perth since 2005, where she is now a Principal Geophysicist.

Anne has been involved with the Australian Society of Exploration Geophysicists (ASEG) since 2010 and is currently President of the WA Branch. She joined WA branch of the AIG in early 2011 and became an Alternate Director on the Federal Council in mid-2011 filling the role of Councillor for Membership. Anne was elected to AIG Council in April 2012 and continues to look after membership issues.



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Semper Parati

Doug Young

Doug Young has over 30 years' experience in exploration for gold, base metals, coal and some industrial minerals. He graduated from Adelaide University with BSc (Hons) in 1973 and completed an MSc at James Cook University in 1992. Since graduation Doug's career has focussed on mineral exploration, information geoscience, coal exploration and industrial minerals.



From graduation to 1986 Doug held senior staff roles with North Broken Hill and Haoma North West as exploration geologist and in senior/supervising geologist roles.

From 1986 to 2006 Doug operated as a Brisbane based consulting geologist with a variety of clients from major mining companies to small exploration companies. This work covered all aspects of base and precious metal exploration, coal exploration, industrial mineral identification including building the first computer model of the underground workings in the Bendigo goldfield. During this time he was instrumental in the identification and acquisition of Nolans Gold Deposit (North Queensland) and developed concepts and interpretation which led to discovery of Isaac Plains, Isaac Plains South and Belvedere coal developments.

In 2006 Doug was the driving force behind the formation and ASX listing of ActivEX Limited, a gold and copper focused junior explorer; he is currently the Managing Director of this company. The company is an active explorer, principally in the Cloncurry district and in south-east Queensland.

Doug has been a Councillor of the Australian Institute of Geoscientists since 2000, committee member of the Queensland Branch of the AIG since 1993 and a former state branch chairman. Doug is a Fellow of the Australian Institute of Geoscientists and a Registered Professional Geoscientist (RPGeo).

Grace Cumming

Grace Cumming is a graduate of the University of Tasmania and a consultant volcanologist who specialises in the delineation of volcanic successions which host epithermal Au-Ag deposits. Grace has worked in Asia, the SW Pacific, South and Central America, Australia and Russia, with



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field trips to Reunion Island, Italy, Iceland and New Zealand.

Grace continues to maintain a strong link with the University of Tasmania (CODES), is responsible for the AIG branch in Tasmania and is an observer on AIG council.

Graham Jeffress

Graham Jeffress has worked as an exploration geologist for companies large and small throughout Australia and PNG. He is currently a Principal Geologist with CSA Global in Perth.



Graham has been a Councillor of the the AIG for WA since 2001, serving as Secretary and then Treasurer. He is currently Council's JORC Code coordinator and representative on the Geothermal Reporting Code committee.

Graham Teale

Graham Teale has over 38 years' experience as a mineral exploration, mining and research geologist. He graduated from Macquarie University with a first class Honours Degree in geology and began his career in the early 1970s as an exploration geologist and petrologist for Falconbridge (Aust) Pty Ltd in Western Australia.



Graham's extensive experience includes exploration and research on the Mount Leyshon gold deposit, the development and mining of gold deposits in the Broken River Province in North Queensland, and active exploration and research on the Curnamona Craton – including exploration for Broken Hill Type mineralisation.

Graham has consulted to numerous companies, presented workshops, and been involved in over 90 publications and conference abstracts. He has been an AIG Councillor for several years and, along with Tom Mayer, has been responsible for the development and growth of the AIG South Australian branch.

Ian Neuss

Ian Neuss was born and raised in northern NSW. He studied geology at UNE and fortuitously ended up with a BSc (Hons) and a Dip Ed. Later he achieved an MSc from Birmingham Uni in Hydrogeology. Ian has worked for various mining companies commencing as a field geologist in Tasmania and Mt Isa with the Geophoto, then CSR in Australia and New Zealand with long stints in Indonesia and other Asian countries. He had an interlude in water consulting before going off to Indonesia again and ended up in Perth managing Outokumpu of Finland's commercial operations and exploration activities in Australia. When Outokumpu sold its mining assets he became involved in the floating of Finders Resources on Indonesian projects in 2004.



Career highlights include being involved in Indonesia in the 1970's on producing mines, and positioning Outokumpu for its venture into

Cont. Overleaf

AIG Council 2012 – 13

Cont. from Page 25

nickel in Australia with the successful evaluation and opening of the Forrester nickel mines, the discovery of the Silver Swan deposit as well as the assessment of the Honeymoon Well nickel project in WA, and all the good times between.

Ian is a Fellow and RPGeo with AIG, was AIG Treasurer from 1995 to 1999, and rejoined AIG Council in 2012. He served on the UWA Centre of Ore Development and Metallurgy Committee from 1996 to 2000, SMEDG in the 1990's and again from 2002, the Executive Committee of the Chamber of Minerals and Energy of Western Australia from 1992 to 2002, and is a fellow of the the Australian Institute of Company Directors.

Jonathan Bell

Jonathan Bell is a geologist and mineral economist with experience in exploration, resource definition, mining and project valuation gained from work with Western Australian mining and consulting companies. Jon gained his BSc (Applied Geology) in 2000 and has since complemented his geological skills by undertaking an MSc and subsequently a PhD in Mineral Economics. Jon specializes in the field of mineral asset valuations, in which he is an innovator, practitioner and educator.

Jon is a Member of the AIG WA Branch Committee, Alternate



Director on the Federal Council and is an AIG representative on the VALMIN Committee. Jon is also a Graduate of the Australian Institute of Company Directors and an Affiliate of the Stockbrokers Association of Australia.

Kaylene Camuti

Kaylene Camuti is an exploration geologist and consultant mineralogist. She has a BSc (Applied Geology) from Ballarat and an MSc (Exploration and Mining Geology) from JCU.



Kaylene began her career as an exploration geologist on the west coast of Tasmania in 1981 and, since then, has worked on exploration projects for precious and base metals in Australia and provided mineralogical and geometallurgical consulting services to projects in Australia, Asia and South America. She has presented short courses for MSc students and in-house training courses to industry in a variety of mineralogy and alteration-related topics.

During the 1990's Kaylene served on the committee of the North Queensland branch of the AusIMM and was Deputy Chair for several years. She is currently Deputy Chair of the Board of the Economic Geology Research Unit at JCU and a member of the Advisory Board for the Bachelor of Geology Degree course.

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Kaylene is an AIG Registered Professional Geoscientist (RPGeo), has been an AIG Queensland branch committee member since 1999, an AIG Councillor since 2000, held the role of AIG Councillor for Education since 2001, and was AIG Vice President from 2011 to 2012. She is the current President of the AIG.

Martin Robinson

Martin Robinson was born and grew up in Rhodesia (Zimbabwe). He gained his degree in geology, specialising in applied hydrogeology, from Rhodes University in South Africa. After graduating he returned to Zimbabwe where he worked for a small hydrogeological consultancy, undertaking groundwater resource investigations through much of central southern Africa. Martin then immigrated to the USA where he worked as a photogrammetrist and had his first exposure to groundwater contamination and remediation.



Following his time in the USA, Martin immigrated to Australia, where he worked for a hydrogeological consultancy before doing a three year stint with the Rural Water Corporation of Victoria. Martin is currently a Principal Hydrogeologist and a Senior Associate (partner) of Sinclair Knight Merz. He has twenty-five years' experience in groundwater and environmental projects.

Martin is past-president of the AIG and a former Councillor for Membership; his experience in both the AIG and hydrogeology provides valuable input into AIG strategy and program development.

Michael Edwards

Michael Edwards has a degree in Geology (BSc.) from the University of Newcastle and a postgraduate masters (MAppSc) from the University of NSW in Engineering Geology, Environmental Geology and Hydrogeology. He has worked extensively in the building and construction industry and also as a technician in the construction and use of electronic equipment.



After completing a degree in geology Michael worked as a consultant in both engineering geology and environmental geoscience

laboratories / consultancies, and was manager for an environmental laboratory in Balmain from 1991 to 1998.

At the end of 1998 Michael formed EBG Environmental Geoscience (Edwards Blasche Group Pty Ltd.) EBG specialises in environmental geoscience (soil and groundwater contamination), as well as working as engineering geology and occupational health and safety consultants.

Michael is an AIG Registered Professional Geoscientist in the field of Environmental Science, an Affiliate with the Institute of Engineers Australia, and an Associate Member of the Australian Institute of Occupational Hygienists.

Michael is the current Chair of the AIG NSW Branch and an AIG Councillor.

Mike Erceg

Mike has over 30 years' experience in opencut and underground mining and exploration throughout New Zealand, Australia and the SW Pacific. He graduated from Auckland University with a BSc in Chemistry and Geology in 1979 and completed a MSc in Geology in 1981. After graduation Mike was initially employed by Amoco Minerals, working throughout NZ on epithermal Au deposits in the Coromandel Ranges and Taupo Volcanic Zone, and Mo/Au/Pt exploration in Northwest Nelson, Longwood Range and Paparoa Range in the South Island.



Since then Mike has worked in Australia on the Red Dome (porphyry Cu/Au) in north Queensland and discovered the nearby Mungana porphyry deposit. He has also worked on the Wafi project in PNG, on Copper Hill, Warraderry and Mineral Hill in NSW, Lawlers Archaen Au in WA, explored for Au and Cu in the Phillipines, and worked on Carlin-style Au for Sino Gold in China.

More recently Mike was involved in development and resource definition at Tritton in NSW. Since 2009 he has worked for Newcrest, initially as Principal Geologist on the Cadia East feasibility study, and now as GM Exploration for the Newcrest / Harmony Morobe Mining JV in PNG.

Mike has been a member of AIG for over 10 years and Federal Councillor since 2011. He is also on the RPGeo committee and is an RPGeo in fields of mining and mineral exploration.

Rick Rogerson

Rick is the Executive Director, Geological Survey of Western Australia, part of the WA Department of Mines and Petroleum. He has worked in executive government positions in Papua New Guinea and Australia and has undertaken contracts for the World Bank and AusAID providing technical assistance to developing countries, mainly in mineral policy and strategic management areas.



Rick has served as AIG President and is currently Chairman of the Complaints Committee and Treasurer of AIG.

AIG MEMBERSHIP BENEFITS

Snowden offer 10% discount off professional development courses for Australian Institute of Geoscientists members

To encourage new membership and in recognition of the services offered by the associations and societies that uphold the professionalism within our global mining industry - Snowden will be offering the individual members of these associations a 10% discount off our public training course registration fees during 2012.

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Resource Estimation

- each delegate will receive a FREE

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Johannesburg	10-14 Sept
Belo Horizonte	17-21 Sept
Perth	24-28 Sept
Vancouver	22-26 Oct

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Perth	9-12 Oct
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Advanced Resource Estimation

- each delegate will receive a FREE 3 month Supervisor licence

Perth	22-26 Oct
Johannesburg	22-26 Oct

Geology for Non-Geologists

Vancouver	6 Sept
Brisbane	11 Sept
Belo Horizonte	27 Sept
Johannesburg	12 Nov
Perth	14 Nov

Mining for Non-Miners

Vancouver	7 Sept
Brisbane	12 Sept
Belo Horizonte	28 Sept
Johannesburg	13 Nov
Perth	15 Nov

Mining Finance for Non-Finance Professionals

Brisbane	10 Sept
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Successful Sampling and QAQC of Assay Data

Vancouver	17-18 Sept
Perth	19-20 Nov
Johannesburg	26-27 Nov

Grade Control and Practical Reconciliation

Vancouver	19-20 Sept
Perth	21-22 Nov
Johannesburg	28-29 Nov

Whittle Optimisation and Strategic Planning

Perth	12-14 Sept
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Metallurgy for Non-Metallurgists

Brisbane	13 Sept
Johannesburg	14 Nov
Perth	16 Nov

Technical Report Writing

Brisbane	14 Sept
Perth	21 Sept
Johannesburg	22 Nov
Perth	30 Nov

Reporting Resources and Reserves

Perth	23 Nov
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Introduction to Geotechnical Engineering

Perth	15 Oct
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Perth	16-17 Oct
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Managing Mine Contracts

Perth	18-19 Oct
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Mining and Sampling Theory for Mine Technicians and Field Assistants

Johannesburg	19 Oct
Perth	29 Oct

Managing Risks and Realising Opportunities

Perth	1-2 Nov
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10% DISCOUNT FOR PROFESSIONAL MEMBERS

In recognition of the services offered by the associations and societies that uphold the professionalism within our global mining industry, we have decided to offer the individual members of the following professional associations a 10% discount off our public training course fees.

AIME The American Institute of Mining, Metallurgical, and Petroleum Engineers | AIE American Institute of Engineers | APEG Professional Engineers and Geoscientists of BC | AME BC Association for Mineral Exploration British Columbia | CIM Canadian Institute of Mining, Metallurgy and Petroleum | SEG Society of Exploration Geophysicists | El Instituto de Ingenieros de Minas del Perú | Instituto de Ingenieros en Minas de Chile | The AusIMM The Australasian Institute of Mining and Metallurgy | AIG Australian Institute of Geoscientists | AMEC The Association of Mining and Exploration Companies Inc | Engineers Australia | GSA Geological Society of Australia | GSSA The Geological Society of South Africa | SME The Society for Mining, Metallurgy and Exploration | SAIMM South African Institute of Mining and Metallurgy | SEG Society of Economic Geologists | IMA Indonesia Mining Association | MNMA Mongolian National Mining Association

FOR MORE DETAILS OR TO REGISTER ONLINE

Visit www.snowdengroup.com
or call Diana Titren on +61 8 9211 8670
or email training@snowdengroup.com

SNOWDEN

AIG Council 2012 – 13

Cont. from Page 27

Rodney Fraser

Rodney Fraser has been a Victorian based geologist for most of his career, working on sediment hosted gold deposits. He currently holds a managerial role at a Victorian mining project.

Rodney is an AIG Councillor and the current Chair of the Victorian Branch of the AIG.



Steve Sugden

Steve is a graduate of the University of Queensland with 30 years mineral exploration and management experience, working on projects ranging from conceptual grass roots exploration through to mining operations, throughout Australia, PNG and New Zealand, in a wide variety of commodities including Gold, Base Metals, Uranium, Iron Ore and Diamonds.

During his career Steve has worked for a number of companies including CRA Exploration, Plutonic, Homestake and Harmony Gold and is currently a Principal Geochemical Consultant with ioGlobal providing specialist geochemical and geological consulting services to mineral exploration and mining clients.



He has been instrumental in a number of economic discoveries both personally and as a team leader, including the discovery of the Wallaby Gold deposit in the Goldfields of Western Australia.

Steve is a Fellow of the AusIMM and Society of Economic Geologists, a Member and Federal Councillor of the AIG and a Registered Professional Geoscientist (Mineral Exploration & Geochemistry).

Wayne Spilsbury

Wayne Spilsbury was born and raised in Vancouver, Canada. He received his BSc. (Honours Geology) in 1973 from the University of British Columbia and his MSc. (Applied Geology) in 1982 from Queen's University, Ontario. With the exception of a four year interlude as a high school science teacher, Wayne spent most of his professional career working for Teck Resources as a field geologist and in various managerial roles in North America, Asia and Australia.

Career highlights include the acquisition and initial drill-out of the Carrapateena IOCG deposit in South Australia and the discovery of several Seafloor Massive Sulphide fields with the Nautilus – Teck JV in PNG and Tonga.

Wayne is a Fellow and CPGeo of The AusIMM, a Member (retired) of the Association of Professional Engineers and Geoscientists of BC, and a Graduate of the Australian Institute of Company Directors. He has served as a Councillor and Vice President of AMEC and Director and Vice President of the BC & Yukon Chamber of Mines. Wayne was a founding director of the Mineral Deposits Research Unit (UBC) and a former Advisory Board member for the Centre for Exploration Targeting (UWA).

Wayne is the current Chair of the WA Branch of AIG and Vice President of AIG Council. ▲▲



UPCOMING EVENT

The WA Branch of the Australian Society of
Exploration Geophysicists

presents

A Practical One-Day Workshop on Airborne Electromagnetics

Targeting geologists and geophysicists, this event will be a one-day seminar series focussed on practical near-surface and mineral exploration applications of airborne electromagnetics. It will include practical theory, case studies and a review of recent and future developments.

WHO SHOULD ATTEND

- Practising geophysicists
- Exploration geologists
- Students

WHEN & WHERE

November 7th, 2012
City West Function Centre
45 Plaistowe Mews, West Perth
registration details to follow

For further information contact Anne Tomlinson (anne@asgc.com.au) or
Chris Wijns (Chris.Wijns@tqml.com)
Sponsorship available

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Education Report

Kaylene Camuti
(Chair, AIG Education Committee)

Applications for the 2012 student bursary program close in early August. To date we have received over 30 applications from Honours, Postgraduate and Third Year students. The bursary committee has started to review the applications and this year's AIG bursary awards will be announced in the November issue of AIG News.

The 34th IGC in Brisbane begins very soon and AIG state branches have provided financial support for several students attending the IGC. We will be publishing reports from students about their IGC experiences in upcoming issues of AIG News.

New Bursary Sponsor

The AIG would like to welcome a returning bursary sponsor:

Terra Search Pty Ltd:

Terra Search offers exploration and data management services from offices in Townsville, Perth and Bathurst. The company has the equipment and expertise to manage mineral exploration programs on all scales, and has over 15 years' experience in providing database services to industry and government.

Many thanks to Terra Search, and to all our bursary sponsors and donors, for their ongoing support of the AIG's education program.

▲▲

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Membership Update

*New Members and Upgrades at the
July Council Meeting 2012*

FELLOWS

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BOOTH Joseph
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FAHEY Ian
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LANDERS Matthew
LOWE Kevin
MAPLESON Darryl
MAZZOLENI Antonio
OLIVEIRA Eduardo
OLIVEIRA Hebert
OLIVER Stephen
OSMON Donny
O'SULLIVAN Dominic
PINTO Marcela
PRADO Maurício
RAMSAY Robert
ROLLINGS Nicholas
SHARPE Robina
SINGOYI Blackwell
SOARES Leonardo
STATS Brendan
STRACHOTTA Christopher

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TANNER
ULRICH
VUCKOVIC
WILLIS
XAVIER

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BAKIE
CAHUANA CUBA
CURTIS
DAS
FONTI
HALLY
HANSMA
HENDERSON
HOSHINO
ISAAC
MASSANO
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DUNSTAN
GETTINGS
ILES
JAMES
KANE
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KERR

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Michael
Simone
Julio
Michael
Anup
Michael
Lee Ann
Jeroen
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Emmanuel
Stephen
Joanne
Timothy
Sebastian
Gerson
Gregory
Michael

Christopher
Madeline
Monique
Tobias
Vicki
Angela
Sam
Matthew
Kieran
Julie
Steven
Lillian
Adam

STUDENTS CONT.

LANGLEY Thomas
LAZO OLIVARES Cassandra
LECORNU Michael
LUMAYAG Lee
MCDONALD Gabriella
MIDDLETON Melanie
MONTEIRO Chrysler
NGUYEN Yen
NOLAN Lyana
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TURNER Nikola
WINCH Eloise
ZHANG Dahai
ZIMMERMANN Joel

RETIRED

FRANKLIN Brenda

ASSOCIATE

FITZPATRICK Russell



*We welcome all new
members to the AIG.*

Registered Professional Geoscientist Approvals & Applications

CANDIDATES APPROVED BY AIG COUNCIL IN JULY 2012

Mr. David MacDonald of Bayswater, WA, in Mineral Exploration
Mr. Hazli Koombi of Kallaroo, WA, in Hydrogeology
Mrs. Penelope Power of Victoria Park, WA, in Mining
Mr. Brett Power of West Perth WA, in Mining

NEW CANDIDATES PUBLISHED FOR PEER REVIEW BY THE MEMBERS OF THE AIG

Mr. Jason Krauss of Kambalda West, WA, is seeking registration in Mining
Mr. Marc Hendrickx of Berowra Heights, NSW, is seeking registration in Geotechnical & Engineering and in Environmental Geoscience
Mr. Amandus Bagayana of Southern River, WA, is seeking registration in Mining and Mineral Exploration
Mr. Josef Major of Victoria Point, Qld, is seeking registration in Geotechnical & Engineering and in Industrial Minerals
Mr Alan Hansen of East Brisbane, Qld, is seeking registration in Coal

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MIKE HARRIS
M.Sc Mining & Exploration Geology
MAIG, MSEG, MSME

Email: mikeh@laopdr.com
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Fax: +856 21 414-870

MINERAL EVALUATION & EXPLORATION

AIG FEDERAL COUNCIL FOR 2012 – 13

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VICE PRESIDENT

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PAST PRESIDENT

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AIG NEWS

CONTRIBUTION DEADLINES

AIG News is published quarterly as per the following table. Avoid disappointment by contacting the Editor at least several days beforehand

ISSUE DATE	CONTRIBUTION DEADLINE
February	January 31st
May	April 30th
August	July 31st
November	October 31st

to advise submission of items for the newsletter.

AIG News is published by the Australian Institute of Geoscientists to provide information for its members and a forum for the expression of their professional interests and opinions. Observations, interpretations and opinions published in AIG News are the responsibility of the contributors and are not necessarily supported by the Australian Institute of Geoscientists or the Editor of AIG News.

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Please use these contacts for all matters relating to advertising accounts, changes of address, AIG News distribution, or membership.

The EDITORIAL ADDRESS is:

Editor: Louis Hissink

Email: lhissink@yellowstoneentp.onmicrosoft.com

Tel: (08) 9427 0820

Please submit all articles, letters and advertisements to the above email address.

SUBMISSION FORMATS

Text: Word Files (Please DO NOT EMBED pictures in Word, supply as separate files.)

Pictures, Logos, Maps, Diagrams: Resolution 300dpi. Photoshop EPS, Tiff, Jpeg or press-optimized PDF files in Grayscale/Bitmap. Please provide images of all pictures separate to text. Please EMBED ALL FONTS in EPS and PDF files.

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Note: All advertisements are mono, no bleed or trim marks.

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The AIG Website is currently undergoing a major update. Comments on content suggestions or new features should be directed to Andrew Waltho: aawaltho@tpg.com.au