



Newsletter

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IGI Ten Year Celebrations

The IGI's 10th Year was marked with a range of activities on May 14th and 15th when the IGI hosted an international Workshop on Natural Resources Reporting in Dublin Castle. A number of events coincided with the Workshop and the 10th Year celebrations including the inaugural IGI golf outing, the EFG Council Meeting and the presentation of the Institute's 1st Medal of Honour.

The golf outing was a great success and while the rest of the country suffered on the 14th from rain and wind a micro climatic event allowed the IGI outing to proceed in near still, misty but dry conditions at Powerscourt Golf Club near Enniskerry in Co. Wicklow. The prizes were sponsored by Investec and despite the best efforts of the geological fraternity from Arup, TOBINS and White Young Green and the other teams that took part the sponsor's team took the honours on the day.



Winners of the IGI golf outing

The IGI Workshop on Natural Resources Reporting was a tremendous success with delegates attending from Australia, America, Asia and Europe. The day long Workshop was opened by Minister Conor Lenihan and heard from speakers drawn from the minerals, hydrocarbon,

aggregate and regulatory sectors describing their respective Reporting Codes and on the implications of the EU Directive on Mine Waste. The need for continuity between the Reporting Codes was stressed as was the importance of honesty and integrity from the geological community in the presentation of natural resources information.



Delegates at the IGI workshop on Resources Reporting

The Workshop was followed by a reception at which EFG delegates Fionnuala Collins and Piers Gardiner formally welcomed the EFG delegates to Dublin. The IGI President Kevin Cullen made a presentation to the EFG President Manuel Regueiro. Manuel, in accepting the IGI presentation, announced that the EFG was awarding a Gold Medal to IGI and EFG past president, Mr. Gareth Ll. Jones, in recognition of the role that Gareth has played in the development of the EFG.



EFG President Manuel Regueiro presenting a Gold Medal to IGI and EFG past president Dr. Gareth Ll. Jones

The celebrations to mark the IGI's 10th Year were then opened by Christian Shaffalitzky, a Member of the Transitional Council, who outlined the reasons for the formation of the IGI and how the Institute has progressed since 1999. Presentations were made to the IGI office staff Susan Pyne and Ethel Stringer in recognition of their ongoing efficient running of the Institute's affairs.

Inscribed copies of the recently published 2nd Edition of the Geology of Ireland were presented by IGI Past President Dr. Pat O'Connor to Dr. Peadar McArdle, Garth Earls,

Gareth Ll. Jones, and Donal Daly to mark their immense contributions to geosciences in Ireland.

The IGI's first Medal of Honour was then presented to John Clifford by Dr. Eileen Doyle, Past President and Chair of the Awards Committee, in recognition of his outstanding contribution to geosciences in Ireland and abroad.



Dr Eileen Doyle accompanied by outgoing IGI President Kevin Cullen presenting the inaugural IGI Medal of Honour to Mr John Clifford

The formal proceedings were closed by the IGI incoming President John Kelly who outlined his plans to take the Institute forward over his 2 year term of office.

With the formal proceedings over the celebrations carried on as IGI members, visiting EFG delegates and Workshop attendees enjoyed the food, drink and music kindly co-sponsored by Investec and Golders.

Kevin T. Cullen, Past President

Setting Up the IGI - Personal Memories

When did it all begin, well I would have to say the drive for Professional geological membership really kicked off in 1992 when the IAEG voted into its constitution the category of Professional Membership of the Irish Association for Economic Geology (PMIAEG). To become a PMIAEG one had to be vetted by the Professional Members Committee. The initial vetting committee comprised John Pyne, Christian Schaffalitzky and Chair John Ashton. In the following years there was a steady stream of IAEG members becoming Professional Members – all of whom came from the minerals sector.

I became President of the IAEG in 1996. The handover, which takes place at the AGM, is usually straight forward where the outgoing president wishes the incoming president all the best: smiles and exits, stage right and so Annraoi Milner handed over to me. All seemed well and then a question was asked from the floor by Christian Schaffalitzky 'what was I going to do about Professional

Membership'. It was true membership had stalled and the title of PMIAEG was not appealing to other geoscientists in particular hydrogeologists. A number of hydrogeologists were keenly interested in having a professional body to join but not so keen on the title of PMIAEG. So what could I do? it was, I believed, something that should be advanced but Christian had asked me a question to which I did not have an immediate answer. I could only promise that I would investigate the situation and try to come up with a plan.

I thought about it and decided that we needed a committee, but this committee would have to involve not just the minerals fraternity but also geologists from other disciplines. However, the first person I had to ask to join the committee was Christian! This subcommittee was called the Professional Affairs Committee (PAC). It was important that the PAC include all disciplines and so a representative from all relevant geological bodies – EFG; IAH – Irish Branch; IEI (Geotechnical section); IGA; IMM – Irish Branch; IMQS; and PESGB – Irish Members were invited to join. The group consisted of Gareth Ll Jones, Eugene Daly, Bernard Murphy, Julian Menuge, John Clifford, Piers Gardiner, Nick O'Neill; Christian Schaffalitzky and myself as Chair. IQUA were also invited but did not send a representative. The PAC developed its own programme and time table. The schedule was ambitious and consisted of:

1. Mid October 1997 – Draft position paper for agreement by all organisations for the launching of a new body.
2. October 1998 – Report from the Committee on progress
3. January 1999 – Affiliated groups to agree to final details
4. December 1999 – Launch of the new institute

Set out above it looks like an easy four step plan but there was a lot of work to be carried out - getting agreement with the various organisations and importantly funding. We started out with the concept of an Umbrella Body. This met with opposition so we closed the umbrella and ran with affiliation. There was a lot of discussion, long hours, listening to concerns (and taking them on board). A constitution also had to be drafted – Gareth Ll Jones, John Clifford and myself put in many hours on this. In 1998 the Professional Affairs Committee received the agreement of most Geological Bodies in Ireland to proceed with the formation of the Institute of Geologists of Ireland (IGI). We even agreed on the name!

To implement the work and launch the IGI a Transition Council was established. Peter O'Connor, representing the Geophysical Association of Ireland, joined the group at this busy stage. Professor Ben Kennedy supported us by providing office accommodation in the Geology Department at UCD and Dr. Peadar McArdle provided us with a launch venue at the Geological Survey of Ireland.

In May 1999, ahead of schedule, the IGI was launched by Minister Michael Woods at the GSI. We had 86 members and 30 applications were being processed. Geoscientists were coming together. There was a bit of a scramble to get the IGI number 007 and it was Alan Dempster who made the grade.

It was hard work, but good fun and a real privilege to chair the PAC and Transition Group and to be the first President of the IGI. We covered everything from writing constitutions to the colour of the logo. We achieved a lot in those few years and importantly we now had a framework and an organisation to progress the lot of geoscientists.

In the first year the IGI set up working groups these included the Public Affairs Strategy Working Group, Drilling Standards Working Group, Resources and Reserves Working Group, Environmental Impact Statement Working Group. In addition, there were the Validation Committee, the Professional Development Committee, Ethics Committee and Disciplinary Committee. Building links and mutual recognition agreements with professional bodies in other countries was also an important piece of work. Continuing Professional Development (CPD), a process where members' activities and planned development are recorded annually was put in place. A website was developed. Naturally all of the above required hard work and was serious business but we still had time to organise social events, such as barbecues at Eugene Daly's house and wine tasting.

The First International Professional Geology Conference took place in Alicante, Spain in July. I gave a presentation on 'Professionalism in Geology: The Irish Experience'. A number of professional geological bodies from other countries were impressed with the progress the IGI had made and with the CPD scheme we had developed.

It had been a very busy few years for me. I was president of IAEG in 1996 and Chair of the PAC and while I was past president of the IAEG in 1997 I was heavily involved in the organising the Annual IAEG weekend course on Airborne Geophysics Conference, which was in vogue at the time, in Galway. By the end of 2000 I was, I felt, all "committee-ied" out and it was time to hand over. John Clifford, who never seems to run out of drive and enthusiasm, became the next President of the IGI in 2000.

At the end of the day it all happened because of the energy, enthusiasm and strong commitment of the team with whom it was a pleasure to work. I know that this work continues with each of the subsequent IGI Boards and we owe much gratitude to them over the years. It is one of the reasons why I think, 10 years on, it was an excellent idea to introduce the IGI Medal of Honour and again it was a great honour to announce the successful candidate, John Clifford, at the award ceremony.

We are a young Professional Body, unlike the engineers who have been around for over 150 years or archaeologist

who have legislation enacted to support their work. We need both time and legislation to strengthen our position but we also need the commitment of all geoscientists. The IGI is a Professional Organisation for now and the future. A professional title is a formal recognition of professional competence and will help, I believe, advance the careers of Irish geoscientists working both in Ireland and abroad. The contribution geologists make to society is often overlooked, we provide the materials needed for our built environment and the necessary understanding of the foundations of on which that built environment is constructed. We work in areas of hydrogeology, infrastructure, marine, sustainable energy, hydrocarbons, minerals and more. We can have a strong voice through the IGI and I look forward to seeing our membership grow over the years ahead.

EurGeol Eibhlin Doyle PGeo

The IGI: Past, Present and Future

I am delighted to be asked to write something to mark the 10th anniversary of the IGI, which I do from my perspective as its first Secretary and the first academic Board member. I was also involved in setting up the IGI's Continuing Professional Development (CPD) scheme. I will make a few comments on what running the IGI was like in the early days, compare the IGI's current situation with its early aspirations and suggest one area for development over the next few years.

In the early years, the IGI Board was preoccupied with working out how to run itself, with building up its membership and with establishing links to other professional and technical geoscience bodies. The Board grappled with fundamental matters like a constitution for the IGI, the criteria and means by which applicants for membership would be assessed, and what work would be done by which sub-committees. There was a lot of work behind the scenes by Board members seeking the financial support of existing geoscience societies in Ireland; these became the Sponsoring Bodies, which were essential to a successful launch of the IGI. We also quickly set about establishing links with professional bodies overseas, especially with a view to mutual recognition of professional titles. My own personal memories from those early days include the joy of taking notes and writing minutes for Board meetings that commonly ran for three hours. I hope that my successors have had less of this! Fortunately, everyone on the Board put a lot of time and effort in on behalf of the IGI and we did have a shared sense that our work was creating something worthwhile.

Where does the IGI stand today? Mandatory reporting of CPD activities by members to maintain professional title is established and shows that the IGI is serious about maintaining standards. It is tempting to dismiss CPD returns as a box-ticking exercise, but how else can the continuing competence of members be demonstrated to the

world outside, nationally and internationally? The number of courses explicitly accredited by the IGI for CPD purposes has also grown, increasing members' opportunities to maintain and enhance their competence. The IGI has produced a number of significant reports and recommendations, for example the Geoscience Graduate and Industry Survey (2005) and the Water Well Guidelines (2007). These developments, amongst many others, have allowed the IGI to firmly establish itself as the voice of professional geoscience in Ireland, with the PGeo title being recognised in Ireland and by several major professional bodies abroad.

Although IGI professional membership has grown over the years, it still consists of a minority of active geoscientists in Ireland. At the 2002 AGM, the President John Clifford proposed a target of doubling the professional membership to 250 by 2006. This target was recognized at the time to be very ambitious and we failed miserably, but a professional membership of 250 is attainable if the IGI can convince a large proportion of geoscientists based in Ireland that membership is worthwhile. For example, the number of academic geoscientists in Ireland, north and south, who would satisfy the professional membership requirements of the IGI must be at least sixty, but only about ten are current PGeos. There are several reasons why membership has not grown more quickly. In the academic field, one reason is that the IGI has not made itself well known to geoscience students, many of whom will become the professionals of tomorrow.

So what next for the IGI? I suggest that the IGI Board explores with academics sympathetic to its aims how it might provide short, intensive courses. These courses would be aimed principally at fourth year geoscience undergraduates and would cover the applied geoscience disciplines, such as hydrogeology, mineral exploration and engineering geology. The courses would provide an invaluable opportunity for students to hear directly from professional geologists about the practicalities of working in the various sectors of geoscience employment. For reasons of economy, courses could be offered at a single location to students from all Irish universities. Planning far in advance would be essential to ensure compatibility with different Departments' timetables and course offerings; in UCD the timetable for the 2010-2011 academic year may be finalised as early as January 2010!

Apart from the obvious benefits to students, the IGI will gain by making itself known to final year undergraduates. The IGI should arrange with the university Departments a means of advertising to these students, when they graduate, the possibility of becoming an IGI Member-in-Training. By this time the IGI should have demonstrated to academic geologists its valuable contribution to the education of their students. A drive to have more academics apply for professional membership should then follow.

Julian Menuge



Fourth Year Students at work in the Lab

Professionalism in Geology – Lessons for Climate Science?

It is taken for granted today that quality standards must be maintained to ensure that society, its industries and the environment are supported. Modern society demands that this protection is statutory or regulatory, and this requires standards to be provided by professionals. Professionals need recognition. This is why we decided to form the IGI: to maintain standards and ensure professionalism.

In the light of such expectations from society, we would expect that the current priority afforded to climate science would also meet similar standards. To me, the unscientific claim that 'the debate is over' regarding man causing global warming suggests otherwise. In this article, I look at the history of the development of professional geology and ask the question: Is climate science doing its job properly for society?

Historical background

Economic geology is the application of geological science to raw materials required for the use of society. As a slogan I first came across in Missouri puts it: "if it can't be grown, it has to be mined". In the 1950's there was only one economic geologist working in Ireland, John Jackson. He was an excellent applied geologist who consulted on every commodity of interest to business in Ireland, from sand and gravel to metals. His knowledge of the country was encyclopaedic but his activity was constrained by the very limited economic activity in Ireland then, as well as the poor understanding of the main geological component of the landscape, the Carboniferous.

With the arrival of Sean Lemass and his colleagues, the history of modern Ireland began. We all know of the amazing success that arose from the first phase of base metal exploration in Ireland, thanks to the promotional work of the then Director of the Geological Survey of

Ireland, the late Murrough O'Brien. He identified the Carboniferous limestones as a target for zinc and lead mineralization. The companies that became the Northgate Group started exploring and in a few years generated a series of discoveries and modern mines that were part of the first phase of the modernisation of industry in Ireland. For a number of years in the 1960s base metal mining represented 5% of GNP.

In parallel, the understanding of the Carboniferous geology evolved. As a young geologist starting work in 1976, I remember the poor level of geological understanding that existed on the stratigraphy of the Lower Carboniferous. It was especially acute for anyone starting work in Ireland then, as the owners of drill holes kept most of the information secret. At the same time, the owners did not know what to make of the data as there was no regional context. Each prospecting licence had an area of less than 50-60 km² and there were up to 400 licences on the Carboniferous of the Midlands, with up to twenty different owners.

In parallel, the geology of the existing mineral deposits was gradually published and their geological characteristics described. These were developed into a number of different models that were applied to exploration. Thus geology was being applied to an economic problem and geological decisions were saving or costing money.

The geologist was asked to spend money for results on which his job relied. If the work failed, his job was at risk. The application of his science, as well as his employment, was reliant on the personal ability of the geologist to use his knowledge well. This is a much more demanding undertaking than making academic observations that may never be tested. That is not to denigrate the necessary scientific observational work that must continue to expand the science, but the rigours of the market are more immediate and importantly, personal.

A second development from this period of expansion was the growth in the number of geologists working for mining and exploration companies. These geologists felt isolated professionally because there was no forum to discuss this new geological spectrum evolving under their feet and in their core boxes. Their employers were insisting on secrecy but their geological knowledge was evolving in a vacuum. In 1974 the Irish Association for Economic Geology (IAEG) was formed and quickly became the fulcrum around which our knowledge expanded rapidly.

As part of this activity, drill core workshops were organised and stratigraphic correlation began to evolve to the regional and national scale. In 1983 this culminated in an IAEG publication on the Lower Carboniferous by Mike Philcox, which became the cornerstone of the modern understanding of the Midlands stratigraphy. In parallel, overseas contacts were established and Ireland became an important centre for economic geology. The IAEG organised several successful international meetings and has always had a

strong overseas membership that wanted to be in contact with a frontier group of geologists developing their science.

Professionalism and the 'Competent Person'

In the 1980s, both in Ireland and abroad, efforts were made to standardise the definition of reserves and especially to introduce the term 'resource'. The investment community required a better understanding of what a mineral asset was. In Australia in 1989 the JORC code was introduced and was immediately adopted by the Australian Stock Exchange. The key requirement under the code was the need for a 'Competent Person' to sign off any report on reserves and resources. This approach forced those of us working internationally to ensure that we were 'Competent Persons'. This definition encompassed many criteria but the key one was competency in reporting resources and reserves for the particular commodity and geology in question. To ensure that objectivity was achieved, the 'Person' signing off needed to be a member of a Professional Body. Note that once again, the affect of this development was personal - if a person could not prove themselves competent by professional recognition, they could not work on this type of project.

Many of us working in Ireland were already members of the Institute of Mining and Metallurgy, a UK based body. However this body had never prioritised professional matters so the IAEG took upon itself the job of trying to accredit Irish based professionals.

The important point is that those of us working as geologists in economic geology had professional obligations and a duty of care that needed to be formalised. If this were not done, others would take up the professional responsibilities required to do our work. Indeed, we considered affiliating to Engineers Ireland, which has been incorporated since early in the twentieth century and would have welcomed us. However our status would always have been as second-class engineers, with no recognition of the science and skills involved in being a geologist.

Shortly after we established a new membership category, Professional Member of the IAEG (PMIAEG), Irish hydrogeologists approached us and asked us could we broaden our professional 'coverage'. This reflected their parallel needs arising from the burgeoning infrastructural work in Ireland and clear demand for their services, at that time not covered adequately by the engineering profession. Thus another branch of geology came of age as a profession. The IGI now represents all geologists in Ireland who seek professional accreditation.

This maturing of geology as a profession has evolved as the science became better understood. In my view, this is the key message implicit in the tale of the development of the modern minerals industry in Ireland. Geology as a science began at the beginning of the 19th century. Modern geology as we know it, and specifically economic geology, only blossomed in the 1960s. Until then, gifted scientists,

geologists and prospectors had practised economic geology successfully but were not applying systematic science developed from geological theory. Once science was contributing directly to economic decision-making in a useful way, the requirement for professional standards developed.

So the key question is: what does professionalism mean within a scientific subject such as geology? For me, it is the understanding of our role as scientists in society. It is our duty to ensure that the highest scientific standards are applied to benefit those affected by our decisions. It also includes a rigorous balancing of the costs and benefits within our areas of competence. The role of the professional institute is to set the standards for the practitioner and ensure that these standards are maintained. As professionalism is rewarded with employment, it is also within our interest to maintain these standards.

The area where economic geologists have the most difficult job is in evaluating a project for mining. A typical base metal mine in Ireland producing one million tonnes of ore per annum will not cost less than €100 million to construct, post discovery and permitting. It is imperative that the best geological thinking goes into the feasibility study carried out to assess the project. A bankable feasibility study attempts to tie down estimated costs to, at worst, a 10% margin. Examples of geological errors that can arise include poor drill hole spacing for resource calculations, poor estimates of ore grade over the life of mine, or describing ore bodies incorrectly so that the mining method is less effective. Professionals playing their role in the economic assessment of a project that goes into development and production will not have to wait long to see the results of their decisions. If they are right, their professional judgement is vindicated and hopefully their long-term future as a professional is assured. If they are wrong, it can cost those professionals their jobs or even lead to liability claims.

Ten years on, we can say that the IGI has made a positive addition to the profession of economic geology. We have been at the forefront of the drive to standardise the classification of reserves and resources. We are an important member of the European Federation of Geologists. We strive to work to the standards set by our profession and our peers. Sadly 'the man in the street' does not often read about the contribution of economic geology to science. We are 'off stage' to the media, despite being the first step in ensuring society is supplied with its needs. However today the big scientific stories come from climate studies.

Professionalism in climate science – a lesson from geology?

Recently I have been thinking about the evolution of our professionalism in the context of modern scientific ideas that we learn of through the media. Climate science is a new field, having only developed since the late 1950s.

Climate modelling, on which so much of the current political impetus is based, is even younger, less than 40 years old. Climate used to be largely regional studies, for example, looking at the differences between maritime and continental, or polar and tropical systems. However quantifying measurements at a global scale is very new.

I first became aware of the details of climate science when Al Gore and others announced that the 'debate was over' on anthropogenic (or man-made) global warming, termed AGW. Man was to blame for a rapidly warming planet and we had little time to fix it. For me, such alarmist talk did not sound very scientific and I wondered how this position had been reached, not having been aware of the debate. Therefore it was with some surprise that I discovered that there is a lively debate on AGW still going on amongst climate scientists, none of which is covered by the media.

I don't know any geologist who, presented with a geological problem, declares an answer and states that the 'debate is over'. The reason is simple – geology is a complex field where one never possesses 100% of the information. This must be the same with climate, especially when only some of the quantitative data has been collected for a maximum of 60 years at a global scale. Actually, as geologists we do have an above average perspective on climate, especially those that work in Palaeoclimatology.

The case for man-made global warming is predicated on climate models. Models are based on ideas on how the planet's climate functions. The models attempt to predict what will be the climate in 100 years. Now the answers from these models are presented to us as a 'fait accompli'. We are told that there is no need to discuss them further but to go ahead and make very large changes to our lifestyles and to our incomes on their interpretations.

A geologist writing a Competent Person's Report for the stock exchange, or a geologist writing his chapter for a feasibility study, knows that many people will audit his work. These include the stock exchange, investors, mining analysts, and banks, to name a few. The data must be available for checking and one must tolerate detailed reviews by one's peers. This ensures that the science can be tested, a *sine qua non* of investigative science. The consequences of failure are personal because the individual is responsible.

My own moment of professional pain as a young project geologist came when showing a famous consultant a mineral deposit that was for sale. I was very comfortable with him querying our maps, sections, compilations, QA and QC work but I was shocked when he insisted on re-sampling our drill core. He also insisted on collecting it, cutting it and bagging it himself. It felt like a breach of trust. On reflection, I realised that he did not doubt our work but was ensuring that no stone was left unturned in his own independent quest for the truth. By the way, his client ended up bidding the highest price.

Within climate science, a serious problem has been the failure of the proponents of AGW to make their data available. One climatologist famously told a sceptical statistical scientist who asked for his data: “We have 25 or so years invested in the work. Why should I make the data available to you, when your aim is to try and find something wrong with it?”. Separately, all attempts to obtain temperature data used in climate models from the British Meteorological Office have been refused. This is not science – this is politics. It also shows a complete disregard for the scientific process and is deeply disturbing in the light of the requirements one would expect of a professional scientist.



Field boundary below peat at Ceide Fields, Co. Mayo. Climate change in Ireland? (Courtesy of OPW)

Despite having looked for the references to back the AGW model and failed, I won't go into the arguments here as to why ONLY carbon dioxide is being blamed for ALL the global warming supposed to have taken place in the later part of the twentieth century, nor how an increase of 350ppm will lead to an increase of 4-5 degrees Celsius by the end of this century. I won't begin to ask how it's known that the consequences are all universally bad. What I do want to address is the failure of climate scientists to practise science properly and ethically. We should have the right to audit their work. Could the refusal to debate be because none of us will be around to sue them in 90 years time if they are wrong? In other words, are there no consequences

for the individual climate expert, despite the fact that we are expected to spend large sums of money based on their expertise?

At present, climatologists do not have professional bodies to represent their interests or provide accreditation for their activities. It is most likely that this is a consequence of being a young science, as geology was in the past. There is an American Association of State Climatologists, founded in 1976, but this body does not provide professional registration or accreditation.

The sums asked for by the climate change lobby are not small – We are talking of billions of euro per annum in Europe eventually, with the closure of 'inefficient' industries and power stations. Where is the feasibility study that assesses the costs versus the benefits to society and the environment of carbon taxes? The only study that came close was the Stern report in the UK but he failed singularly to consider more than one option – the one already favoured by the politicians who commissioned his report. If Professor Stern is wrong, can we sue him? If professionalism stands, we should expect the most exhaustive economic study before embarking on what undoubtedly will be a radical reorganization of modern society.

If the debate is over, it should be a simple matter to put the facts on the table. There are quantitative questions that should be answered with data. Any doubts can be dismissed easily if the science is clear-cut. The refusal to supply data shows a lack of integrity and professionalism on the part of climate scientists and a failure to understand the nature of certainty in their own field of study. As a taxpayer and therefore a client of climate science, I should be able to demand a better service provided by professionals doing their job to a measurable standard. As a professional geologist, it is what I would expect from a professional climatologist, or indeed any other professional scientist.

EurGeol Christian Schaffalitzky PGeo, CEng FIMMM

Geotechnical Society of Ireland

The Geotechnical Society of Ireland (GSI) was established in the 1980's under the auspices of the Institution of Engineers of Ireland (IEI, as it then was), in order to promote the skills and interests of a small number of Irish engineers and related professionals who worked in the fields of Geotechnical Engineering and Engineering Geology at that time.

As one of only a handful of societies recognised by IEI (now, Engineers Ireland), membership of GSI was open to non-engineers. In the absence of other national professional bodies in the earth sciences, it attracted many earth science professionals who were working with or as part of

engineering teams on development projects. GSI continues to actively welcome all interested parties to join and to attend its evening lectures and seminars.

Since its foundation, the membership and relevance of GSI within Engineers Ireland has grown appreciably, according as the range, scale and complexity of building and civil engineering projects undertaken in Ireland has increased.

Today, GSI is the recognised national representative body of the [International Society for Soil Mechanics and Geotechnical Engineering](#) (ISSMGE) and the [International Association for Engineering Geology and the Environment](#) (IAEG). It has also developed close working relationships with the [British Geotechnical Association](#) (BGA), the UK [Association of Geotechnical and Geoenvironmental Specialists](#) (AGS) and the [Northern Ireland Geotechnical Group](#) (NIGG) of the Institution of Civil Engineers.

From its earliest days, GSI sought to highlight the need for, and value to, engineering professionals of a greater understanding of the nature and origin of the geological materials with which they work and how this improved understanding can, in turn, help in developing a better insight into their likely engineering behaviour.

The founding of the Institute of Geologists of Ireland in 1999 was a logical progression in the promotion of the professional interests and value of geologists and related earth science professionals working with engineers in Ireland. Recognising that a strong and vibrant representative professional body for geologists in Ireland was in the interests of all related professionals, GSI readily lent its support to the establishment of the IGI at that time.

The founding of IGI in the early 'tiger' years was both fortuitous and timely. In the years since, many complex large scale engineering and development projects have been completed by multi-disciplinary teams using specialist technical and managerial skills offered by geological professionals. The emergence and existence of a thriving IGI gives our shared clientele greater confidence in the quality and value of the services we provide.

Until the invention of sky-hooks, everything we build will be built on, in, or under the ground. GSI acknowledges the contribution made by the IGI and its members to the advancement of geotechnical engineering in Ireland in the short years since its inception.

We wish IGI continued success in educating and promoting the interests of the geological professionals necessary to secure Ireland's future.

And finally, we welcome this opportunity to wish IGI and all its members a happy and well deserved 10th birthday.

Mining in Ireland

The contribution of the mining industry to the Irish economy over the past ten years, both directly from the mines and indirectly from spin off, has been substantial. The mines have also provided considerable employment. This has been particularly valuable in that the employment given has been located outside the main cities and urban centres.

Production of zinc from the three Irish base metal mines, Navan, Galmoy and Lisheen, during the past decade has resulted in Ireland ranking worldwide in the top ten for zinc – the only commodity worldwide in which Ireland ranks in the top ten. These major zinc mines have been operated with a level of environmental responsibility which compares favourably with the highest international standards.



Lisheen Mine, Co. Tipperary, where capital investment at mining start-up in 1999 was €210 million. (Photo courtesy EMD)

Exploration for zinc has continued in Ireland and more zinc has now been discovered in Ireland per square kilometre than in any other country in the world. Recent results both from the traditional limestone areas and from sedimentary hosted stratabound terrane by Conroy Diamonds and Gold give rise to hope that Ireland's major role in the zinc mining industry may be maintained and continued in the coming decade.

Gold, traditionally the main mineral exploration target in Ireland, until the Navan and Galmoy discoveries, has now come back into prominence. A gold mine is in operation in Ireland in the Sperrin Mountains in County Tyrone. Advanced exploration is taking place elsewhere in the Sperrins and in the Longford-Down Massif a thirty mile gold trend running from County Armagh across Counties Monaghan and Cavan has been discovered by Conroy Diamonds and Gold.

Conroy Diamonds and Gold has also reported a 1 million+ ounce JORC compliant gold resource on 20 per cent on its Clontibret Target in County Monaghan - the largest gold resource reported in Ireland or Britain to date. The Company has recently announced the discovery of a gold-

in-soil anomaly at Clay Lake in County Armagh which is larger and has higher gold-in-soil values than Clontibret. Gold mining in the coming decade may also play a significant role in the Irish mining industry.

The property and financial boom has, perhaps, obscured to some extent the major contribution of mining to the Irish economy. In the present rather bleak environment the valuable and sustained contribution of mining to Ireland's economic well being, employment and social prosperity may well become better understood and appreciated.

Professor Richard Conroy

IAH October Field trip

On the first weekend of October the IAH (Irish Group) headed 'Into the West' for its annual fieldtrip. An impressive turn out of over 40 participants made their way towards Galway to view a wide range of hydrogeological environments. First stop on the Saturday was on the coast at Kinvara where staff from NUIG outlined progress with Griffith Award funded research on coastal spring discharge and saline intrusion. **Tiernan Henry** noted that a relationship can exist between groundwater and marine environments and the Water Framework Directive is requiring disciplines to work together to better understand such interdependencies, especially where they may influence catchment management decisions. **Barbara Petrunic** and **Catherine Elder** outlined the various water sampling and geophysical surveys underway to develop an improved understanding of such settings.

The group headed to Oughterard in the afternoon to visit newly installed EPA groundwater monitoring and research boreholes which have completed in the granite bedrock. **Matt Craig** and **Pat Durkin** from the EPA outlined the background to site selection, borehole design and methods of data collection with **David Ball** noting the importance of supervision of drilling to ensure high quality, long-term monitoring is achieved. **Ray Flynn** from QUB who is undertaking research on the granite 'poorly productive aquifer' discussed geophysical and geochemical results to date and how they were helping to reveal the movement of groundwater in these poorly understood hydrogeological settings.

Following an overnight stop in Oughterard, the group heading to Gortgarrow karstic springs southwest of Glenamaddy where **Matt Craig** and **Pat Durkin** from the EPA outlined the context and approach taken to monitoring the spring flow. Following this **Robbie Meehan** presented an overview of work undertaken to understand the catchment of this locally important water supply.

Developing this understanding is important for both implementing groundwater protection measures and for estimating available resource that can be sustainably exploited. **Eugene Daly** contributed to the discussions with

information on surface geophysics undertaken in the area which is revealing potential structural controls on groundwater flow in the area.

Peter McConvey
IAH Fieldtrip Secretary



Hydrogeologists having a 'Ball' next to boreholes

The Geothermal Association of Ireland 2008 - 2009

The Geothermal Association of Ireland (GAI) is a voluntary organisation consisting of professionals from the commercial, public and academic sectors including geologists, hydrogeologists, service and mechanical engineers, heat pump suppliers and installers, well-drillers and lawyers. Its aim is to promote awareness and utilisation of geothermal energy in Ireland.

In November 2008 the GAI celebrated its tenth birthday with a very successful conference in Kilkenny: Geothermal Resources in Ireland – Commercial Opportunities, which was attended by over 120 people. This was supported by: Geothermal Energy Ltd; Philip Lee Solicitors; Arup Consulting Engineers; SLR Consulting Ireland; MasterHeat Ltd.; Institute of Geologists of Ireland.

The conference was opened by Minister for Energy Eamon Ryan, who spoke at length of the great potential for geothermal energy in Ireland, whilst guest speakers included Dr. Hans Goldbrunner of Geoteam Austria on Spas and Closed loop systems - latest developments in Europe and Keynote Speaker Prof. Ladsy Rybach of Switzerland, President of the International Geothermal Association on Geothermal Global & Europe Perspectives.

Other speakers included: Geothermal in Ireland, *Gareth Ll. Jones*, *GAI*, *Conodate*; Geology / Hydrogeology issues in Ireland, *Ric Pasquali*, *SLR Group*; The Newcastle Deep Borehole Project, *Padraig Hanly*, *Geothermal Energy Ltd.*; Contractual Arrangements for the Operation and Maintenance of District Heating Schemes, *Liam Ó*

Cléirigh, Byrne Ó Cléirigh Ltd.; The Role of Geoscientists in Geothermal Industry, Kevin Cullen, President IGI; Geotechnical and Structural Aspects of Open Loop Geothermal Systems Mike Long, Dept. Civil Engineering, UCD; Geothermal Heating / Cooling Systems - Planning, Installation & Monitoring Case Studies, John Burgess, Arup Consulting Engineers; Legal issues of geothermal development, Diane Balding, Philip Lee Solicitors Energy Dept.; Banking/ investment/ financial issues of geothermal, Norman Fitzgerald, AIB Corporate Banking; Report from the Geothermal Working Group, Ben Dhonau, DCENR ; GAI the next 10 years, Brian Connor, Chairman GAI



Minister Eamon Ryan with the GAI Committee and guest speakers

Attendees included: Geological Survey of Ireland; Geological Survey of Northern Ireland; Green Party representatives; Sustainable Energy Ireland; Action Renewables; ESB International; Geothermal and other Drillers, Geothermal Installers; Consultant Engineers; Stockbrokers; Corporate Financers; Banking and legal representatives; Academic Institutions; Energy Consultants; City & County Representatives; Energy Agencies



Keynote Speaker Prof. Ladsy Rybach of Switzerland, President of the International Geothermal Association deals with Global & European Geothermal Perspectives.

There were ten trade stands: Geothermal Association of Ireland; Geothermal Energy Ltd; Philip Lee Solicitors; Arup Consulting Engineers; SLR Consulting Ireland; MasterHeat Ltd.; Patrick Briody & Son Drillers; O'Neill Ground Water Engineering; Bauer Equipment; UCD Gateway Project.

The Irish Times carried an article about the conference and its content the next day:

<http://www.irishtimes.com/newspaper/ireland/2008/1106/1225893546964.html>

The presentations and pictures from the conference can be viewed on the GAI website: www.geothermalassociation.ie The GAI holds lectures in Dublin and Cork and field trips throughout the year and visitors and members are welcome.

Gareth Ll. Jones

Priority Geotechnical

Celebrating 3 years in successful business in the field of Engineering Geology

Priority Geotechnical, PGL was established in July 2006 and forms part of the Priority Group joining: Priority Construction, Priority Drilling, Groundsource and Hydrographic Surveys. Management staff at PGL, comprises of Chartered Engineers and Geologists, having over 60 years combined experience in the field of ground investigation, geotechnical engineering and design. This staff structure allows PGL to offer a unique and comprehensive service in the area of ground engineering and foundations works. We offer both contracting and professional services to meet our Clients requirements both technical and economical. It is the aim of Priority Geotechnical to offer a single point of contact for an extensive range of geotechnical services.

As part of the Priority Group the capabilities of other group companies has provided PGL a means of undertaking a wide range of activities. The Priority Drilling resource has allowed for intensive rotary drilling works to be undertaken on large contracts fast tracking completion dates. The geothermal well drilling resources of Groundsource have allowed PGL to undertake extensive well drilling contracts. Priority Geotechnical have in turn provided geotechnical advice to Priority Construction at both tender and construction stage. As PGL have a wide and varied Client list our contacts allow other Group members access to markets outside their usual sphere of business activities.

As part of a larger group all the partner companies have benefited in terms of expanding their portfolio of works and availing of inter-company expertise and cross-market awards. Something which has put the Group in good stead during these difficult times.

The Priority Geotechnical field team consists of four full-time Geologists form backed up by two Engineers and Project Managers. This mix of professions allows expertise in the construction industry to merge with the knowledge of ground conditions and geological formations.



The reporting team comprises of a Chartered Engineer and a Geologist again bringing the two professions, Engineering and Geology together to provide a comprehensive view on ground conditions. A strong ethos of ‘knowledge sharing’ has evolved providing our staff with a means of developing their skills. Chartered status for our Geologist being one of the Companies goals.



Recently Priority Geotechnical have purchased jack-up plant, expanding our capabilities and resources allowing direct company control over marine works. Currently PGL are programming for four near shore investigations. This plant now allows for an expansion of our services and the chance for our staff to gain further valuable experience in the field of Engineering Geology and Geotechnical Engineering.

Visit our web page www.prioritygeotechnical for further information on the Company and priority Group.

Soil Names: The Minefield

The description of a soil can often be confusing from the use of non-standard local names, to field observation, geological formations and standardized naming systems. The use of a standardized system is always favorable, offering consistency in naming soils.

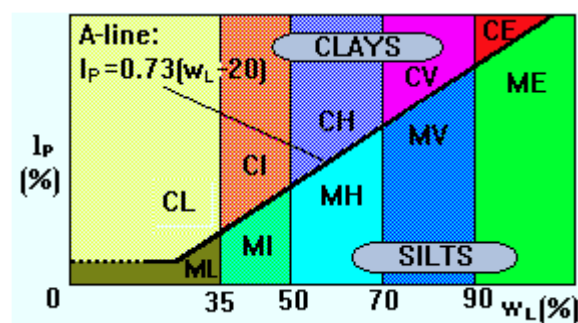
I have on numerous occasions been asked “Why is it a soil containing up to 65% granular particles is called a SILT or CLAY?”. Well the simple answer is BS5930! And specifically Table 13 of the standard. This standard, commonly specified for ground investigations works, makes a distinction between the two soil types: fine grained, cohesive soils (SILT and CLAY) and coarse grained, granular soils (SAND and GRAVEL). And what leads to the confusion is the “35% by weight rule”: if 35% or more by dry weight is either a SILT or CLAY (the principal soil type) then this fraction of the soil characterizes the soil behavior as cohesive. Care should be taken as soils with <35% fines may still present characteristics of fine grained soils. BS5930 excludes descriptions such as silty CLAY. A soil is either a SILT or a CLAY, as determined by the A-line. SILT/ CLAY may be used where there is ambiguity over the principle soil type.

So firstly we must determine the particle size distribution and establish the percentages of each soil constituent, gravel, sand, silt and clay. It is important that any field description is validated by laboratory testing to ‘fine tune’ the field descriptions where visual and tactile assessment cannot accurately distinguish the percentage distribution of fines. Where 35% or more has been identified as passing the 63µm sieve (fines) we take the path of describing the soil as a SILT or CLAY. Then we have to look at the granular fractions. If >35% sand or gravel (secondary constituents) then we can call the soil ‘sandy’ or ‘gravelly’. The use of ‘very’ is permitted where >65% is present however it is rare for a soil to have only a single second constituent. Of course 35%, 35% and 35% >100% so strictly we cannot have ‘sandy gravelly CLAY’ for example! Where <35% sand or gravel is present we use ‘slightly sandy’ or ‘slightly gravelly’. It does seem unusual to describe a soil as ‘slightly sandy slightly gravelly CLAY’ where say: 30% sand, 34% gravel and 36% CLAY are present. However this is typical of many glacial tills in

Ireland, we have almost equi-proportional gravel, sand and silt or clay content. So that seems straight forward! 35% is the magic number.

Now, when we identify <35% fines, the soil is either a SAND or a GRAVEL (or a SAND AND GRAVEL if the sand and gravel fractions are equal). If <5% of a soils secondary constituent is present then that constituent is identified as 'slightly'. Between 5% and 20% the soil constituent remains as is 'silty, clayey, sandy or gravelly'. With >20% we identify the soil constituent as 'very'. This makes for numerous combinations! For example: 3% silt, 37% sandy and 60% gravel is described as 'slightly silty sandy GRAVEL'. That seems logical!

Above we mentioned the A-line. What is this? Well this line delineates between SILT and CLAY soils by plotting a soils liquid limit and plasticity index. Soils plotting above the A-line are CLAY and below are SILT. It should be noted that there are very few if any CLAY soils in Ireland, as CLAY refers to a specific mineralogy. What we have here in Ireland are strictly clay sized particles. So it will be found that many glacial till soils plot close to the A-line.



Soil Plasticity Chart

And to further complicate soil names, organic soils and PEAT do not readily fall under the above standard system. But that's another lesson.

Greg Hayes BE MEngSc CEng MIEI

Congratulations

New Professional Members

Congratulations are extended to the following candidates who were awarded IGI affiliation as Professional Geologists and to those who took up the European Geologist title during 2009:

Brendan Almack
Shane Bennet
Donal Hogan
Richard Langford
Georgi Magaranov
Michael Mlynarczyk
Tim Moynihan
Shane O'Rourke
Jenny Rush

Neil Sandes
Barry Sexton
Jonathan Talbot
Suzanne Tynan

In addition, the IGI welcome the following new Members in Training:

Margaret Browne
Conan Daly
Cróna Gray
Laurena Leacy
Rebecca Noonan
James Stratford

IGI Website – News, Events, Training Courses and Employment Opportunities

We encourage members to visit the IGI's website at www.igi.ie for up-to-date information on news, events and training courses. If members have activities or positions they wish to advertise they are encouraged to send them in to admin@igi.ie. We also invite all members to forward items of news or general interest. Geological photos are also welcome.

Neil McNelis

It is with much sadness that the IGI members learned of the death of Neil McNelis (1973 – 2009). Neil died on the 15th August following a tragic accident in Killaloe.



Neil was a member in training with the IGI and worked as an Environmental Consultant with WYG for nine years. It is always sad to lose a member of the Institute but it is particularly sad when it is somebody as young as Neil and with so much to offer.

Neil was born in Killybegs Co. Donegal and very appropriately it is where he was laid to rest beside his father (Dr Frank McNelis) who passed away when Neil was very young. He moved with his family to Limerick City at a young age. His secondary school education was at Newbridge College in Kildare, following which he moved to Dublin where he completed an Earth Science degree in Trinity (1997) and a Masters in Environmental Resource Management at UCD (2000).

Although for most of his life he did not live in Limerick he considered himself a Munster man and was a proud member of the Munster Rugby supporters club. In a professional sense he will be remembered as being an incredibly hard working and diligent person who enjoyed his work and was always willing to give of his time to assist others. Neil described himself on twitter as an "Environmental consultant working in contaminated land. Easy going and like a pint!" He will be remembered as a person who was full of life and a great friend to all who knew him. Neil is sadly missed by his heartbroken mother, sister and brother, relatives, work colleagues and his many dear friends.

Murrough OBrien

It is with sad regret that we note the recent passing of Murrough OBrien, former Director of the Geological Survey of Ireland. An obituary that reflects Murrough's many interests and achievements will be published in the next newsletter.