

GUEST EDITORIAL

RESEARCH IN GEOMECHANICS IN AUSTRALIA

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I have been asked to write a biting incisive editorial about research in geomechanics in Australia. Well as I am an engineer clear analysis (in its broadest sense) and not biting incision are more likely to be my hallmark. Further I am a late entrant into geotechnical research having spent most of my career in consulting. Notwithstanding these limits I offer the following thoughts from the point of view of a practitioner and academic.

'... a common response from ARC peer reviewers is 'If the research will have the stated benefits to industry then industry should fund it''

There appears to be two major problems facing geotechnical research in Australia, money and students.

Research in Australia is generally funded from either Australian Research Council (ARC) grants or from industry. Generally our research is "applied" and a common response (recounted by disappointed applicants) from ARC peer reviewers is "If the research will have the stated benefits to industry then industry should fund it". From discussions with disappointed applicants this seems to be a common response. This raises a number of issues. Firstly the benefits are generally spread right across society, as would be the case with improved footings over reactive soils or say better slope design. As research is a long term commitment (years at least) those with a problem today are unlikely to have their problem benefit from any research started today. Thus the benefits of research are unowned future benefits for indeterminate members of society. It is hard for anyone to capture and own the results of geotechnical research because, unlike other areas of engineering, these are rarely patentable. There are also implications that "industry" is a monolithic entity which acts with one mind and that applied research is less worthy of ARC grants than pure research. I am aware of one researcher who at one time was involved with four grant applications; one was successful and that was the one, in his own estimation as an expert in the relevant fields, with the least merit but had supportive reviewers.

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Reviewers have often said that the work proposed has already been completed, this often shows a lack of understanding on their part. Often it takes a doctoral student a year to find out that what is being undertaken is in fact new and radically different from work apparently tackling the same problem. In fact I'm of the opinion that

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in most areas of geomechanics our ignorance far exceeds our knowledge - not many problems have really been solved. At the best we have useable answers to some problems. If you are asked to assess an ARC application, help your colleagues, take the trouble to do the job well. If you don't know the proposed researchers inform yourself. If you think it has been done, find out why some else in the field thinks it has not been. Be supportive of good proposals, please don't take this as a request to be supportive of bad proposals.

In my experience about four out of every five geotechnical engineers in Australia have postgraduate qualifications, maybe two out of ten have doctorates. In the past this has been considered typical of what is required to practise in our field. Even though geotechnical engineering is not as novel as twenty years ago, it is still not at the point where a graduate from a civil engineering degree can claim expertise in the area. This will be exacerbated by the pressure to include more people oriented (social, legal and managerial) aspects in our undergraduate programmes; these pressures are well founded as more and more engineering projects are being controlled by these issues and engineers have been poorly equipped to deal with them.

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Each year in October, even in these times, a few firms ring and ask have we any good graduands from our postgraduate programmes. Generally the answer is "yes but" they are already employed elsewhere or they are not Australian residents. If we are to maintain the level of expertise in young geotechnical professionals then we must find ways to encourage those with some experience to return to university. The scholars we are looking for at MEngSc level are honours graduates, at research level preferably a good honours degree. These people find work in industry easy to obtain and need some inducement to return to study or research. If our profession requires postgraduate qualifications we must offer those inducements.

If you are in industry, look to funding some research on problems that interest you. Fifteen to twenty five thousand dollars a year, tax deductible on attractive terms, is generally enough to get good Australian graduates to undertake postgraduate research. These students will work 2500 hours a year on research and receive many hours of supervision and technical assistance. This cost to benefit could not be matched by any commercial organisation. This is the much discussed "win-win" situation, the firm wins with directed research, the scholar wins with postgraduate training, the university wins with good postgraduate students and society wins with more knowledge.

Three thoughts to finish.

As I write the tertiary entrance requirements for 1993 have been released. At UNSW civil engineering, mining engineering and applied geology have entry requiring students to be in the top 13 to 16% of high school leavers (out of interest environmental and computer engineering, the top 3%). Other universities have a similar story. Thus Australia will have a continuing supply of talented graduates, let's hope that there are jobs in industry for them and that some wish and are able to undertake research.

Late last year I and many others were concerned to find the University of Western Australia and CSIRO proclaiming to the world that "coordinated, multi-disciplinary education and training in Geomechanics" was not available in Australia. Everyone expects commercial organisations to make somewhat outrageous claims (in spite of S52 of the Trades Practices Act), but such a claim does no service to our profession nor the claimants' colleagues. For over twenty years, UNSW has offered postgraduate programmes in geotechnical and mining engineering and engineering geology. We have recently introduced environmental engineering and a combined course enabling a student to obtain both civil and mining engineering degrees. Postgraduate students are able and encouraged to take subjects from the different schools and often research supervision is drawn from more than one school. I expect that other universities in Australia have similar programmes. The simplest enquiry would have revealed the above information.

Some refreshing activity from Standards Australia, public meetings to consider/contribute to draft standards for both piles and residential slabs and footings. These are to be encouraged but now the geotechnical community must contribute. Despite widespread disquiet about the draft site investigation standard only three individuals turned up to voice their views at a public meeting held in Sydney.

THE WIZARD OF ID.

by Brant Parker and Johnny Hart

