Seismic window

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AEGC 2018: the 26th or the 1st?

Was the recent conference in Sydney the 26th ASEG conference or the first AEG Conference? I'll let you make up your minds on that but here are a number of observations:

There were many minor but noticeable shortcomings at the recent AEGC in Sydney that the ASEG conference manual would have sorted out years ago. Do the other societies know about the detailed conference planning documents in the ASEG files?

Many people referred to the conference as the PESA conference – surely a sign of the changing of the guard.

While there were hundreds of conference bags left over, most of the copies of *Preview* were snatched up (I only get it to read the articles!).

Although there was nothing ground breaking for me, I thought the AEGC put together a good technical programme with some interesting geological and geophysical papers. I would like to see some more big announcements at our conference, but the larger conferences like SEG and AAPG seem to be where new technologies are revealed. They seem old hat by the time the Australian conference comes around.

Now a more serious look at what makes a good conference – the promotional giveaways in the Exhibition area (Figure 1). I didn't see them all, but here's what my sampling has come up with:

Best popular – the laughing Kookaburra (Pawsey)

Best useful – large tape measure (Zonge)

Best fit – Down Underwear (DUG)

Tastiest – 30 cm stick of Welsh rock (Robertson)

Flashback – colour pencils (Velseis)

Purplest – shopping bag (Shearwater)

Most variety – notepads, power adaptors, first aid kits, pens etc. (CGG)

Figure 1. *A sample of AEGC promotional items.*

The article that follows was sent to me for comment and I thought it might start some good discussion in this forum. It deals with artificial intelligence, ageing and the loss of skills in our industry caused by a lack of mentoring. Do we still think like geologists? Anyway, take it away Bala.

Computers and the human brain in our business: questions to consider

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What drives success in our industry? *Where do computers stand vis-à-vis the human brain?* There is no question about the role of computing power in our business. And today, there is the reality and promise of Big Data and Artificial Intelligence (AI) driven techniques and technologies. What and where is the role of the human mind? Is it a clear cut answer or is it context dependent?

From observation of practices in our industry over many years and in different settings, *it appears that computers do not yet completely run the show.* They may, eventually, but it could take a long while to get there – completely. At least in our lifetime, I expect that much of the necessary creativity will still be generated by the human computer.

When Exxon beta tested their ISIS (Interactive Seismic Interpretation System) in our Esso Kuala Lumpur office in the mid-80s, there was much excitement. It felt amazing that you could interpret seismic horizons, erase horizons, tie lines, change your mind, easily redisplay in different scales, use colour and make maps by-passing the Drafting Department. No more posting values on maps and getting them drafted in sepia. No more using your ears as holders for Derwent colour pencils and Staedtler erasers. And erasing paper seismic sections until there were holes in them!!

There is no doubt that we have made huge strides in productivity since those days. But in all of this, having observed many of our computer savvy practitioners of the art going about the business of building exploration and production geological models, I am left feeling uneasy about over-reliance on the magic of computing, and the less than critical acceptance of the outputs. Don't get me wrong, I love my interpretation and mapping systems and I am an active interpreter using software.

The fundamental issue is that computer processes work best where there is very good data, e.g. good 3D seismic data.
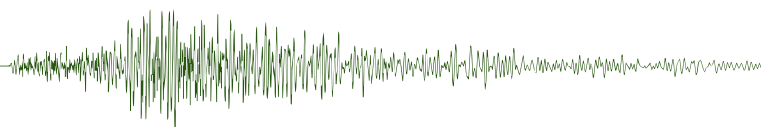
High density well control also helps greatly. Most of our interpretation is about extrapolating from known well control into the unknown. If you work in areas of poor seismic imaging and/or limited well control where there is still great petroleum potential, *much of the work is in the mind of the interpreter.* And a geologically oriented interpreter *uses the power of computing to 'shape an interpretation' instead of accepting the shape of the interpretation provided by the computer.*

There are several issues in the way that the power of computing has affected thinking and action in our business. There is the undeniable power of computing that makes processes easier and faster. *However, over the decades, there appears to be an aura that has developed around computing that has had an effect of separating the computing from the actual geology under study*. In the early days, geological principles were top in the mind when you took a pencil to either contour a time structure map or a sand isopach map. *You had to stop and think about the*

structural style. How do we expect the faults to link, relay, step out etc.? Given the 2D seismic line spacing of at best half a kilometre if not 2 km, there was a great deal of gap to fill. The gap was shaped by the structural model in the mind of the interpreter. If the fault is listric in section, how do you shape the structure contours? If the section shows a compressional 'flower structure', how do you link the faults and shape the contours? And as for isopachs, how do contours of a fluvial channel sand look compared to a distributary mouth bar system? And can you recognise the difference by looking at log patterns and the succession of facies before you contour the isopach? Are you thinking palaeogeography?

I am sure that there are many experienced interpreters who have come across work that with better geological thinking could be improved greatly. There are many examples of poor interpretations leading to expensive dry holes that could either have been avoided or achieved better overall outcomes. It is possible that future computer learning systems will capture the

essence of an experienced geological mind in improving interpretation outcomes, even under less than ideal data quality and quantity situations. In the meantime, from my perspective, *it is important that managers in our business recognise these challenges and that better training and mentoring programs be put in place, so that while computer processes are being enhanced, geological interpretations do not suffer and lead to avoidable expensive mistakes in our business.*

I submit these observations from my background and experience, as a way to add to the discussion on optimal usage of computers vis-à-vis the human brain in our business. I am sure that there are diverse views on this subject and am happy for an open exchange.
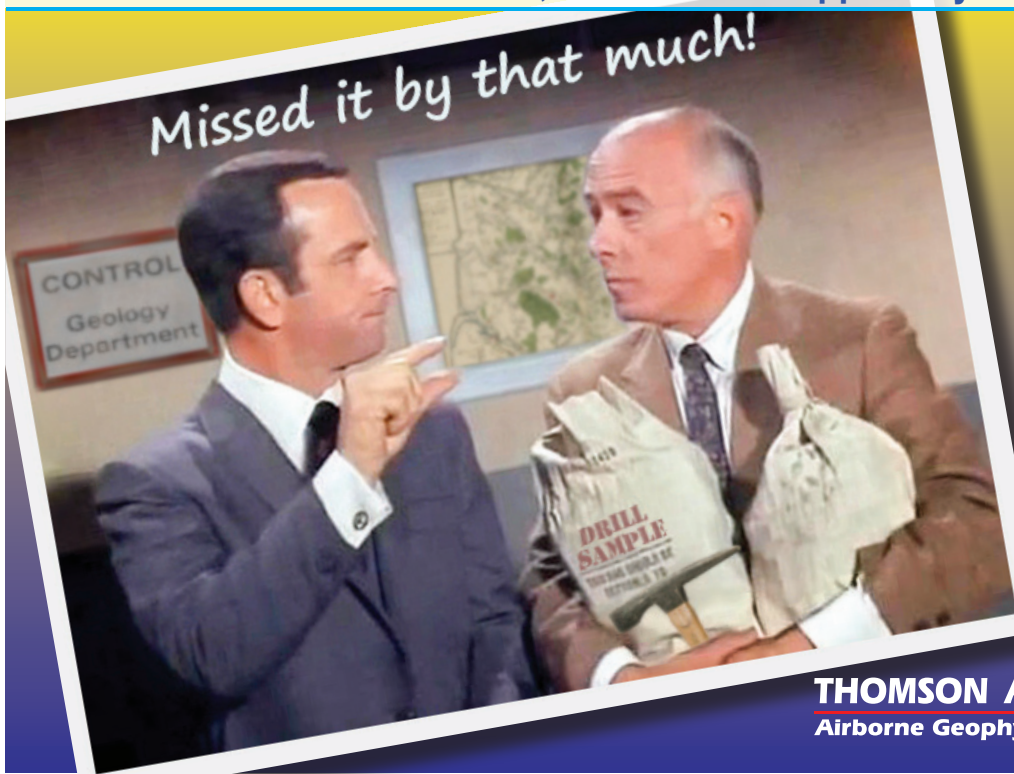
Wishing all of you continued success in your work regardless of where you are in the spectrum of using the combined power of computing and the human brain.

From Melbourne

Bala