

Bergforsk Annual Meeting

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Address by Deming Whitman, CEO AMIRA International.

Globalisation of Minerals Industry R&D

Thank you for your kind invitation to speak to you today.

Some of you are well familiar with AMIRA but for those of you who aren't, AMIRA is a minerals industry association whose role is to broker research projects between groups of industry sponsors and one or more research institutions. We have offices in Africa, Australia, Latin and North America. Our members are only producers of minerals and suppliers to the industry. Governments and researchers are not eligible to join. Unequivocally then we represent the industry. 80% of the largest 30 mining companies around the globe are included in our 60 plus membership.

We heard yesterday and earlier today about the impact of globalisation on the minerals industry. I've chosen to talk about globalisation of mineral industry R&D which could sound like a trendy topic. I hope I don't disappoint you if I say it is not breaking news: It has been happening for a couple of decades.

But before you file out of the room, thinking that this then is a good time for a break, let me quickly add two more points: First, it is a transition which a great many people have missed, and second, the location of world class research activity is continually changing.

It is also a development that presents some challenges to Sweden and to Europe in general, but also possibly some opportunities.

Because of the way industry research is evolving, I am even tempted to say that you now stand at a crossroads: You could be part of an emerging global research elite, or you could miss out.

Mineral industry research may be unique in the 21st century world for one reason; It is one of the few research fields not dominated by the USA or Western Europe. In

breaking out of that mould it may be creating something of a new research model, a geographically disparate but intellectually coherent world wide network of specialist researchers: A virtual community, as people now like to say, although this one is rooted in some very identifiable centres.

Identifying where world class researchers abide and the areas in which each specialises is a core task of AMIRA International. It is one of the foundations of our service to our members, who comprise most of the larger players in the global minerals industry.

We have a team of research directors and project managers dedicated to identifying promising research, wherever in the world it is being conducted. When they see promising research they work with the researchers to refine that into a definable program and then invite our member companies to form syndicates to support that research and so gain access to the technologies that emerge.

At any one time we have around 45-50 research projects in our portfolio with total budgets of around US\$50-\$60 million. We would also, at any one time, be examining – with varying degrees of excitement – perhaps another 30 projects....evaluating them for their potential benefit to industry, their probability of delivery and of course probable cost.

Over the course of two or three years we would therefore look closely at well over 100 potential or actual research projects around the globe, probably more.

That gives us a pretty good feel for where the best research ideas are emerging.

Currently four countries dominate: Australia, Canada, the USA and South Africa. That is not to say this group has a monopoly, because we also currently have research being conducted in Chile, in the UK, in France and in a number of African countries, but these others tend – at present -- tend to be the minority of projects. Australia, Canada the US and South Africa dominate the list of those proposals our members choose to back. You might accuse me of being too Anglo-centric in compiling that list, but I plead not guilty; it is the reality of the global minerals industry.

I am loath to put a precise ranking to those top four nations because each has some very good researchers, but I will say that for once the USA is not dominant; it is up there with Australia and Canada, but at best, first among equals..

When you look at that spread and recall that Europe also have some excellent researchers in this field and that Latin America is making a determined bid to move up the list (we had a forum with Latin American researchers in Santiago last month and I was impressed with the work they are doing) you realize that this may be the first industry to truly globalize its research base.

You may quibble with the term global when Asia is not as yet on that list, but I think that is only a matter of time: China has a big and expanding mining industry and India's too is becoming significant. Both these countries' research communities are growing in terms of both numbers and capabilities; China, for example has developed some excellent coal technologies.

If these nations follow the pattern they have in other fields, you will find them looking to establish a substantial research presence. They will do so because in a globally competitive commodities market, they can't afford to be left out.

As most of you here know, even if you want to buy ready-to-deliver technology, you have to be in the research loop just to know what is happening and where and how to apply it. That is one of the functions AMIRA provides for our members.

For many of you in this audience this listing of research excellence begs the question: Given their strength in other fields and the long tradition they have in mine engineering and metallurgy, where are Western European nations? Where is Sweden?

In the case of Sweden I can answer the question in one word: expensive.

You have some very good researchers here – very fine minds – but they are in competition with world class researchers in Australia, North America and elsewhere who can deliver at substantially lower cost.

It is hard for us at AMIRA to channel research here under those circumstances. Our industry is, as I say, probably history's first truly global research market and our members simply want the best research at the best price.

I do not know the answer to that problem, but I do suggest it is a problem you may want to address. Knowing the intellectual vitality which Sweden has demonstrated in so many the areas I find it hard to believe that you will not make a greater contribution.

Perhaps some of the funding available through the EU's 7th Framework Programme will help create a solution. That is something we would like to explore. (and if any of you here can help us navigate its complexities, your assistance would be most welcome. You in Sweden have had 12 years to master the detail of EU programs; some of us domiciled elsewhere are still learning),

I sincerely hope that this or some other mechanism provides a solution,

What we are seeing now is increasing cross fertilization between industry researchers with complementary expertise. To take just a few examples we at AMIRA currently have joint research running between Chilean-Australian, African-French, Australian-US and Australian-African teams working on geoscience projects; British and South African researchers jointly working on microwave communication, several three nation teams drawn from Australian, South African and Canadian universities working on mineral processing. There are at least a dozen more research projects that are being jointly conducted by several universities and institutes in the same country. AMIRA has also recently joined MIRO in the UK and intends to partner that organisation to expand our access to research capability in Europe.

I could give more examples, but I think you get the picture: We have this network of quality researchers and they frequently combine to create virtual entities to tackle particular projects.

I suspect that this will lead – or perhaps is leading --- to the formation of something like a super league of researchers. The best will increasingly want to work with the best and because this interchange leads to good results, their reputations will be increasingly enhanced

Then the big research dollars will start to flow to these star teams. To some degree they already are: The majority of our projects with multi-million dollar budgets are being tackled by consortia of researchers.

I don't claim any special credit for identifying this trend because several nations have not only seen it but acted on it. It is no secret that both South Africa and Chile saw getting the establishment of an AMIRA office in their respective countries – and supported by their local industries -- as a major step towards getting their university researchers involved in international collaborative efforts.

I suspect Australia may have been something of a model for this because I know there is at least one doctoral thesis being undertaken at a British university which seeks to explore how Australia's minerals industry grew from dependence on imported technology to a technological leader – giving it not only a large and globally competitive resources sector, but also a useful export market in mineral technology.

That transition is not lost on other countries, particularly in South Africa and Latin America. They see it as a means of ensuring that their domestic mineral industries are not left at the back of the queue when new technology becomes available. They want promising local research students getting experience in high level research projects and they want their best scientists plugged in to cutting edge global work.

It is not my place to start giving advice to MITU or to Sweden on how they should address this challenge. It would be quite presumptuous of me to do so, given that there are so many areas of technology where Sweden is an unquestioned world competitor. It is something that on the whole you have been remarkably good at.

But I don't think it is out of place for me to describe as I have the global picture in our sector and the challenges you face.

I am sure that all of you here – researchers and industry representatives alike – have occasional difficulty with a public mind-set that sees mining and processing as not a “modern, technology-based industry.” There is;” a feeling that because people have been mining for millennia that it is somehow an ‘old technology’ industry.

Everybody in this room knows of course that this is not so. The intellectual challenges facing our industry as we seek to discover minerals that are increasingly deep – minerals we need to maintain our lifestyles – and to mine and process these in ways that are not only commercially efficient but consistent with society's aspirations for sustainable development, are enormous.

Nowhere will those challenges, particularly the environmental challenges, be greater than in Europe. It would be a terrible irony if of Europe, in many ways the cradle of mining and processing technologies, had to turn to countries like Australia, Canada, South Africa, or potentially perhaps Latin America, for the technologies it needs to ensure its future.

It could happen, because while good ideas may emanate from here, it will take dollars to turn ideas into workable practice. Those dollars will substantially come from the bigger miners, for they are the ones with the resources to fund systematic, ongoing research; the kind of research that leads to substantial and continuous improvement.

And because sustainability is an industry-wide problem, I suspect much of the research into more efficient processes and practices will be collaborative – conducted by syndicates of companies through organisations like AMIRA and MIRO which in turn will put together teams of researchers.

What will decide who gets these research contracts? The ideas will be an important consideration; the quality of the people who will work on it will be another. So too will be the track record of the research organisations in delivering on major industry projects. And finally, there is cost. The challenge for all researchers is that each of these hurdles gets progressively higher.

You are up against institutions in other countries which have developed a pretty high degree of excellence through decades of attracting international research funding ...and which have both a track record of delivering collaborative projects at competitive prices.

This becomes a self-perpetuating advantage, because each time an organisation is funded for a major project it is able to involve a new generation of doctoral students, the best of whom stay on to become full-time researchers.

The global pattern in our industry at the moment is that the majority of such institutions with global reputations are tending not to be in Europe. There are good institutions here – we are in one at the moment – but you face strong competition in Australia, Canada and the US. And it may get tougher: As I have said several nations are making a determined effort, with government and industry help, to get their research institutions into this elite group.

Your local industry is extremely supportive; we all can see that by the attendance here today but they too are exposed to increasingly global pressures. The local industry must compete against the global industry not just other Scandinavians or even other Europeans. Yesterday we heard about the major change in exploration expenditure that came about when Sweden opened its doors to foreign companies. You must ask yourself why are their interests in R&D here not similar. Your ore bodies are potentially globally competitive, clearly your research is not perceived the same way. Yesterday one of the speakers remarked that Lulea wanted to offer research across all of the industry's technology needs; may I suggest that this is a high-risk strategy. An old phrase, 'jack of all trades, master of none' comes to mind. No institution I have come across has this strategy. These successful institutions and researchers focus on areas where the world will beat a path to their door. You have key strengths; nurture them and avoid duplicating what others do better and cheaper. Create the critical mass; actual or virtual.

Having fired that salvo I would like to move to some safer ground. What defines or confines a successful company is not geography but its human resources. It needs highly skilled people; people with a deep understanding of theory and practice in their field.

In my view, this is one of the most important products of vigorous research institutions.

Two years ago we at AMIRA did a study of people who had worked on research projects that we had initiated in the past 14 years. The 191 university-based projects

involved 430 students and 65 post-docs. Of the students some 261 – or 53% -- were PhD students.

The majority of those students had gone on to work in the industry. Quite a few were hired by companies which adopted the technology developed in the project on which the student had been working. How better for a company to develop instant understanding of new technology than by hiring someone who has just completed his doctorate developing it?

Others stayed on at the university and developed a second or third generation of the technology and trained the next generation.

If you want your brightest students to go on to become your industry leaders, you need to find a steady flow of cutting edge research for them to work on.

But who will fund that research? Sweden has a solid minerals industry but only a few companies large enough to afford multiple and sustained research programs.

If you want a sizeable number of students to have access to cutting edge research; if you want to remain a technological competitor in this industry, you may need to attract work from the global industry, not just your own.

As I have said repeatedly today, this is not in itself an obstacle: there is a global research market in our industry and the major companies and organizations like AMIRA are happy to place research contracts wherever they find the best people at the right price.

That is the pattern of globalization everywhere, in any field. It opens up huge opportunities, for the best to gain access to a worldwide market. If you are good, there are few limits to your ambitions. If you are not among the best however, it poses real challenges, for you are now increasingly measured against world standards, not local ones.

That is the challenge facing research institutions in our industry today. Not just here but everywhere.

You – they – need to find ways to get involved in these multi-institute bigger-budget research programs, marrying your special skills with fellow researchers with complementary skills.

To fall behind the pack now – at this point in global research development -- is, in my view to put yourselves at long term risk of eventual irrelevance. I am sure you do not wish and will not permit that to happen.

The EU Framework programs offer you the opportunity to work on a larger stage and collaborate with the best Europe has to offer. Remember however, that it is a global stage that you are competing for in the minerals industry.

In conclusion let me say that I am afraid my news has not been all good. I fear I may have outlined more challenges than solutions.

But if I have not been able to hand you all a ticket on the express train to research success, I hope I have at least been able to tell you which platform it leaves from. I look forward to seeing you there.

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