THE WARREN CENTRE

INNOVATION LECTURE

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DELIVERED BY DR KEITH WILLIAMS AM

CEO, PROTEOME SYSTEMS LTD

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prologue

The Warren Centre works in partnership with many organisations to deliver its projects and activities. We are pleased to be working with the new Melbourne Business School, which is providing the venue for The Warren Centre's Melbourne Innovation Lecture, not least because it portrays itself as 'Opening Minds, Changing Lives→Organisational Renewal'. This could well be applied to the whole Warren Centre Innovation Lecture series.

They also use the prefix 're' as in renew, reach, real, refresh, relationships and results to introduce its activities. This is what successful innovators do instinctively to change minds so that new ideas will take root and start to grow. Successful innovation invariably changes our lives in a positive way either in the short term or, as is often the case in sustainability, in the long term.

Our innovation lecturer this year, Dr Keith Williams AM, lives in the biomedical technology and engineering space, but this is not at the heart of his message.

Dr Williams has steered his company, Proteome Systems Ltd, beyond the initial hype and has successfully navigated the 'valley of death' where many with less resolve have despaired and either sold out at a substantial discount to the real value of their innovation or else just given up and moved on. Under his charismatic and dogged leadership, Proteome Systems grew by 80per cent in 2003 to a turnover of $21.5 million. It is ranked 34th in the Business Review Weekly's latest Fast 100.

In this 9th Warren Centre Innovation Lecture, Dr Williams tells of the opportunities presented by Australia's and New Zealand's geographical position as the only western nations located in the time zones stretching from Japan and China through to the Indian subcontinent. It shifts the focus from the USA as a channel to market to Japan and ultimately China and proposes that an innovation based in Sydney can be at least as successful, globally, as one based in North America.

Professor Michael Dureau
Executive Director
The Warren Centre for Advanced Engineering

THE **Warren** CENTRE
FOR ADVANCED ENGINEERING

williams

DR KEITH WILLIAMS AM

Dr Keith Williams AM

Keith Williams is the founder and Chief Executive Officer of Proteome Systems, a proteomics company of 140 staff headquartered in Sydney, with a wholly owned subsidiary in Boston, USA and joint venture (Proteome Systems Japan) with Itochu Corporation in Japan. He holds Adjunct Professorships at both The University of Sydney and Macquarie University and is on the Editorial Board of several proteomics journals.

He has been at the forefront of the proteomics revolution over the last 10 years. His team invented the term "proteome" and helped define its meaning. In 1996, Professor Williams founded and was the inaugural director of The Australian Proteome Analysis Facility (APAF), the world's first national proteome facility, funded under the Australian Government's Major National Research Facilities program. He trained 38 PhD students and published more than 290 publications in the fields of proteomics, cell, molecular and developmental biology. Professor Williams co-edited the first book about Proteomics, "Proteome Research: New Frontiers in Functional Genomics" (Springer Verlag).

Keith Williams graduated in Agricultural Science from the University of Melbourne as a University Medallist. He completed his PhD in Biochemistry at the Australian National University in 1973 and spent two years on the staff of the Biochemistry Department at the University of Oxford, UK, followed by 5 years at the Australian National University as a Research Fellow. From 1980-1983 he was a Nachwuchsgruppenleiter at the Max Planck Institute for Biochemistry in Munich, Germany. In 1984, he was appointed to a Professorship at Macquarie University in Sydney where he developed a large research centre which focused on molecular aspects of development of Dictyostelium and he implemented a major Biotechnology Program at Macquarie University. In 1999, he founded, along with key researchers in his team, Proteome Systems Ltd, which is located in the high technology Biohub at North Ryde in Sydney.

Keith is well known in the Australian business community, being nominated by both the Business Review Weekly and the Australian Financial Review as an innovator and business leader in the high technology industry. He is a frequent contributor to business forums and was made a Member of the Order of Australia in 2004.

I am delighted to have the opportunity to give the 2004 Warren Centre Innovation Lecture this evening. Having read a number of the lectures by my predecessors, it is clear that this lecture provides an important venue for discussion about innovation in the Australian community. I thank the Warren Centre for choosing me at an interesting time in the development of Proteome Systems.

While I have a healthy respect for being serious, gathering statistics and shaking one's head about the state of the business world, I have to confess that my view is hopelessly optimistic, and I am most effective when I am out there doing something. So, tonight I shall tell a few stories in the hope that our experiences in setting up Proteome Systems may be of interest, and provide another perspective on the long running innovation debate that the Warren Centre Innovation Lecture has triggered.

To help you understand a day in the life at Proteome Systems, I will give you a horoscope that Brynnie, my partner, gave me recently to provide perspective on a particular day at the office. It turned out to be pretty accurate for the day in question.

Here it is: *There may be a lot of appointments to keep up with today, perhaps deadlines to meet, introductions to make, speeches to present, information to digest, statistics to assimilate, hecklers to ignore, protests to attend, political agendas to manipulate, the media to placate, the wind to hide from, barriers to defend, shattered remnants to sweep up, scrums to sort out, chaos to control, madmen to avoid, and attend various outrageous parties as well. It seems to be a bit of a "Nero fiddling while Rome is burning" type of a day or two.*

This lecture is the 9th in a series of talks given by CEOs of innovative Australian companies. All have commented on the Australian scene, and how their companies have grown in this environment. As Evan Thornley, CEO of LookSmart, remarked in his lecture last year, the experience of Australian technology companies has been very similar and little changing over the last 20 years, going all the way back to Memtec. To paraphrase Evan: "We are little understood by the Australian business community, widely ignored by the press and ineptly supported and often actively sabotaged by Australian Governments".

Contrast this experience with the rhetoric we hear about Australia's future. The Liberal Government's "Backing Australia's Ability", Labour Party's "Knowledge Nation", Queensland Government's "Smart State", all provide a vision of Australia, "The Clever Country". But dig a little and you will see a focus on buildings, R & D and a palpable fear of helping Australian technology industries grow. Even the venture capital community has the small vision of pricing companies down so that they don't get enough resources to grow properly.

In titling this talk "Our time (zone) is coming", I wish to indicate my belief that things are on the move and that we live in the right part of the world to take advantage of where the growth is. China and India are huge domestic markets that are undergoing rapid growth, as is the rest of Asia.

My skills are not on the political side. I have little patience and cope poorly with organised structures or government. Others must take up the baton at the institutional level and I have little to say as to how this should be done. Getting Australia to support Australian technology businesses and help facilitate their global growth is a large and longstanding problem. Perhaps this issue is big enough and sufficiently intractable to be worthy of consideration as a Warren Centre major project?

My contribution is in the great Australian tradition of having a go. At Proteome Systems we figured that if things are going to change, you have to start somewhere... and so we started! We got together a group of bright enthusiasts who wanted to make a difference and were prepared to see how far we could go (or optimistically, how long it was going to take) to build a globally significant biotech company headquartered in Sydney.

I will cover the Proteome Systems' story under the following headings:

(i) People; (ii) Partnering; (iii) Brand; (iv) Products and (v) Exports/Time Zone.

Before getting down to the nitty gritty, a word about the role of innovation in business in 2004. The Dow Jones Industrial Average, perhaps the most influential industrial index in the world, is comprised of 30 companies. Recently, rebalancing of the index was announced.

This is a significant event, the last change occurring 5 years ago. Three companies from the old world industrial sector were removed, and were replaced by a company in the insurance sector (American International Group Inc: market cap US$186 billion), a company in the telecommunications sector (Verizon Communications Inc: market cap US$101 billion); and a company in the health care sector (pharmaceutical company Pfizer Inc: market cap US$267 billion). These companies are knowledge or services businesses.

When I looked at the 30 businesses comprising the Dow Jones Industrial Average, a casual classification put 10 of these businesses as being based on innovation and intellectual property development. These account for one third of the businesses and also 30% of the weight in the index. Three of these businesses (Johnson & Johnson, Merck & Co and Pfizer) are health care businesses. Others are making significant steps towards acquiring new emphasis on the life sciences. The recent acquisition of Amersham by General Electric and the resulting formation of a new $US14 billion division, GE Healthcare is a case in point.

So, one view of the current Dow Jones Industrial Average, is that it is beginning to look like the Dow Jones *Innovation* Average. Make no mistake, the old industrial companies are either disappearing or reinventing themselves and we all need to take this seriously. I applaud the Warren Centre for its long-standing identification of innovation as worthy of attention.

On to Proteome Systems. Our company is headquartered in Sydney with a wholly owned subsidiary in Boston, Massachusetts and joint ventures with Charles River Labs in Worcester, Massachusetts (Charles River Proteomic Services Inc) and with trading company Itochu in Tokyo, Japan (Proteome Systems Japan KK). Born in 1999 with 14 staff, we now have 140 staff and we are a life sciences business. We have chosen to operate in an area that we see as crucial to many of the products that will emerge from the life sciences revolution. We are a proteomics (industrial protein science) company, and have the distinction of operating in a field that one of our founder's named. Marc Wilkins coined the word “Proteome” as part of a competition in my laboratory at Macquarie University in 1994. This was a bit of marketing to help redefine the field of protein science from an old and stodgy field of endeavour into the technology base that we think will help transform the life sciences. *Proteomics* is important because it is about studying proteins in a holistic fashion.

Even those of you who are not biologists will probably have heard about the human genome and how genomics has redefined biology. It is true that the sequencing of the human (and other genomes) has changed biology, but it has transformed the *intellectual* base of *biology* rather than the *product* base of *biotechnology*. Genomics is about DNA and DNA is about information. When you get sick, you don't treat information, you treat the disease and the disease is manifested as changes in proteins. Take away the water and you are half protein, and proteins are responsible for making the other bits (sugars and fats). Virtually all drugs target proteins in providing treatment and many of the new treatments are themselves proteins. Proteomics is therefore at the centre of diagnosing as well as treating disease. It is not a fad, it is here to stay.

So Proteome Systems lives in a big and emerging space at the cutting edge of where biotech products are heading. The challenge has been how to transform an old, slow, difficult science into something more accessible. To do this, we had to get involved with changing the technology. Along this path we developed a suite of technology and informatics products that we now sell. With these transforming technologies we also make discoveries that are leading to a revolution in personalised diagnosis and prognosis of disease treatment, as well as the next generation drugs.

In a mature industry, technology providers and users of technology usually live in separate businesses. We argue that it is so early in the proteomics industry that it makes sense to both develop technology as well as use it. This produces a virtuous cycle whereby technology innovation leads to new products that enable discovery of new generation drugs and diagnostics, but a spin-off of this work is the definition of yet more technology products. So you get an enhanced return on your technology (or discovery) dollars invested...and you stay ahead of the technology game. From a business perspective it also helps, as the hybrid business model has

near term earnings from technology and IT sales as well as (more risky) upside from diagnostic and therapeutic products.

I will now tell you about different aspects of our business and how we have approached growing the business.

i) Pay attention to your people

The Proteome Systems' story is all about people.

Often business is discussed as if it is a concrete entity of itself. It can be argued that some of the bricks and mortar industries, (eg car manufacturing) are industries that do have a physical presence. But if you take away the people, the companies don't have a long future. .... think Nissan, a car manufacturer in the wilderness until its new CEO, Carlos Ghosn, gave it vision and direction.

The industries that are changing the world are much more ephemeral. They are about people with outstanding skills who meld together to build a framework to do remarkable things. In the services industry, it is entirely ephemeral. In our (biotechnology) industry, it is a mixture of people, intellectual property (patents etc) and products. But, be in no doubt, a patent on its own has little value without the dreamers to articulate its worth and in biotechnology products tend to come late on the scene.

The Proteome Systems' story is a good case in point. As an innovative group, we did a fair bit of invention while still at Macquarie University and we built some bricks and mortar in the form of a major national facility, the Australian Proteome Analysis Facility. When we decided to go corporate, our experience was similar to that of many spin-outs from government organisations. Trying to round up the intellectual property and put it into the start-up was too slow and too tedious, and anyway, much of the IP had been licensed to a large US company. We knew that the real value was in the heads of six key people who left the university, and we started afresh with no intellectual property (ie patents) on day one. We had our collective experience and a strong sense of working together and not a lot more.

Some people thought that we were crazy leaving behind a $7 million facility, several million dollars in grants and a nice portfolio of patents that were beginning to generate royalty income. History shows that we had not lost the plot. We started Proteome Systems on a partnership with Dow AgroSciences, a big US company. Today, five years later, we have an intellectual property portfolio of 53 patent families and 122 patents progressing through the system. And the business has accessed $60 million of investor capital, $20 million of partnership funding, $5 million of Government support, and we have made sales in excess of $20 million.

In this new knowledge world, the critical thing is people. We have grown the business by building a robust infrastructure, where people matter. They want to come to work and they are involved in ambitious dreams, which include helping change the world! How do we attract the best people? We do it by creating a vibrant environment and being the best. In Australia, we benefit from the paucity of established technology businesses. This means that ambitious people tend to gravitate in our direction as they want to be part of an exciting and challenging growth experience. It is very surprising to me that many technology companies fail to value their technologists' ability to contribute to growing the business; instead they pigeonhole them and see them as a cost to the business rather than a valuable resource.

If you have good ideas, passion and values, can make friends with other people with good ideas, passion and values, and you are focused on products as the outcome, the patents, products and the cash will follow.

We have watched some very cashed up competitors in the US and Europe seek to dominate the proteomics space by buying their way in, several investing several hundred million US dollars in the process. These groups have not been successful because they did not get the right people or they got the right people, but they did not meld them into a team that wanted to build a business.

Lesson number one: Get your act together and pay a lot of attention to your people. Make sure that you use them productively, not only to do smart technological things, but also use their brains more globally. Your technologists can help evolve new products when things change, which often happens in the technology game.

(ii) Rapid growth through partnering

There are various ways of growing a business. In the US, where capital is much more accessible, it is quite common to raise a lot of money and spend the early years building an infrastructure. In effect, the early hires are fundraisers who put in place the cash to mess around to find out what the business is about. In Australia, a very dry continent, only small amounts of money are available so that there is no way that you can grow a business in this American mould. There simply is not the cash to waste in searching for a business.

Often in Australia, you do the reverse. Inordinate amounts of time are spent writing a business plan to try and project cash flows down to the last dollar. A focus on minute detail can be quite silly in a technology area because things change all the time. What you tend to do in Australia is agonise forever, think small and behave extremely cautiously because you are cash starved. Had Proteome Systems been established in this conventional way, we would probably be building one product now and have a very limited future. I certainly wouldn't be giving this lecture.

As I have already mentioned, we started the business with a deal with Dow Agrosciences. Some senior executives at Dow wanted to understand Proteomics and how it could help their agbiotech programs. We wanted to get Proteome Systems established. By careful planning both parties got what they wanted. Dow got to see how three of their difficult programs were helped through our technology and Proteome Systems avoided venture capital funding in the early stage, which often leads to massive dilution and loss of control by the founders.

We started with ambitious goals that went well beyond the Dow partnership and we have been very focused about achieving them (even as they evolve!!!). The business started with a powerful interdisciplinary team, who had spent more than a decade thinking about and actively pursuing, in a university environment, how the biotech revolution was going to play out and the critical gap that proteomics filled. Since we all owned the business, we were highly motivated in building it.

We partnered to leverage ourselves and we quickly realised that partnering, especially with very big companies, has all kinds of advantages. Firstly, and most importantly, one partnership led to another as powerful companies got comfortable with us because we had partnered with other powerful companies.

We also realised that by setting up partnerships with big and powerful companies we could learn at lot. Our global strategic alliance with IBM is perhaps the easiest to understand. We were able to set up a very high level partnership with IBM soon after they set up their life sciences business. IT in the life sciences is still very primitive. It is absolutely clear that the life sciences needs to adopt modern IT practices, but when we set up the alliance with IBM in 2001, this was not the case and it is only beginning to happen in proteomics in 2004.

We approached IBM because we had built a software package to integrate a whole lot of activities in our area of life sciences. We wanted an IT platform to mount our software on but more importantly we needed credibility to help sell our software. IBM was interested because we wanted to sell their technology, unlike many life sciences businesses that wanted a big computer but whose business model did not involve selling IT solutions.

Personal connections also helped. Caroline Kovac, head of Life Sciences (now Healthcare and Life Sciences) for IBM, visited Sydney at a critical time and key Proteome Systems staff met with her. This helped her understand our passion and strategic views. So we got IBM's attention and after a lot of due diligence, we signed off on a global strategic alliance. The due diligence itself was interesting because it exposed our IT team to a very professional bunch and it was very reassuring to me as CEO to find our team earned the respect of the IBMers after a relatively short period.

The IBM deal involved co-funding a marketing program to sell our high level integrated solution that was a combination of IT and wet lab instrumentation in proteomics. Much more important was learning about how IBM sells big integrated technology solutions, because that is what we were getting into. Being very high level partners, we were exposed to aspects of IBM's business that few people get access to. We learnt a lot, we learnt it quickly and it has stood us in good stead in selling our technology. Another significant benefit

of the IBM relationship is that we can go anywhere in the world and call on senior IBM staff to help sell our technology solutions.

The IBM partnership also helped us to leverage another big deal with a conservative “best of breed” contract services group, Charles River Laboratories. A lean, bottom line driven major US corporation, Charles River's business model is to acquire rather than partner. We were not for sale, but they decided we had the best solution for a proteomics contract services business. We had no interest in setting up a “fee for service” proteomics business as it is a tough game that requires special skills in pricing and delivery. Charles River Labs have been in the contract services business for 50 years; they are the best at it! The obvious solution was a joint venture business where Proteome Systems technology was acquired and we became the key technology provider, while Charles River contributed the operational skills. So we now own 20% of one of the world's major proteomics contract services businesses, and this is a superb window on our technology for the US market.

Another example of how partnering has worked well for us concerns Shimadzu of Japan, a 125 year old Japanese engineering company that is an outstanding instrument manufacturer. Personal connections, vision and recognition of mutual benefit were the glue that made a deal happen. I met a young Japanese engineer, Toshi Somehara, from Shimadzu at a conference in Japan shortly after Proteome Systems was established. Toshi knew Shigehiko Hattori, a key senior executive at Shimadzu. Hattori had a vision of evolving part of Shimadzu's traditional laboratory instruments business into a leading edge life sciences provider. He saw a partnership with Proteome Systems as a way to develop some highly innovative products jointly and reposition Shimadzu at the front of the emerging field of proteomics.

Xcise™ — Integrated Protein Gel Processing Robot.

Hattori's support helped to establish the partnership around the manufacture of two complex and innovative instruments. We leveraged this program with a START grant from the Australian Government. Through the Shimadzu partnership, we have learned to become a quality instrument manufacturer. We make one high tech instrument (Xcise™) and our partner Shimadzu makes another (ChIP™). The process of learning how to make a complex instrument was enormously helped by the experience, rigour and attention to detail of our Japanese partner... very painful on the learning curve, but very powerful to sell an instrument that has the Shimadzu logo alongside the Proteome Systems' logo. While the partnership started at a high level, we now have interactions between the two companies at all levels of each others' business (R&D, engineering, manufacturing, QA/QC, purchasing, sales and marketing etc). It has been very gratifying to have an instrument built by us in Sydney nominated as one of the “Top Ten New Products (in Japan) for 2002” by the prestigious Nikkan Kogyo Shimbun, a leading Japanese industrial newspaper. More good news for us is that Shigehiko Hattori has since become the president of Shimadzu corporation, so we have a strong and friendly connection at the top of this large Japanese instrument company.

We set up relationships that will be robust and able to weather the stresses and strains of day to day activities and indeed new directions that we may choose to go with our partners. We don't always get it right, but we work hard at it. It means that a lot of senior management effort in our business is directed towards relationship development and maintenance, but we think this is effort well spent. It has lead to a low attrition rate in our partnerships. And we have been able to grow very fast through partnering.

We have an Asian style approach to business and when we set up a partnership, our intention is that it will be a long term thing. All of our partnerships have clear business objectives and they all have benefits for both parties. It requires too much effort to establish a one-sided partnership for small or short term outcomes.

I have heard the US versus Asian style of doing business described as follows: In the US the primary focus is on a legal agreement, followed by focus on the purpose of the partnership (eg joint product) and maybe you get to know your partner eventually. In Asia you start with the relationship which progresses towards joint activities

(eg products) and maybe one day a formal legal agreement. We favour the Asian approach but have enough of the US style to make sure we have strong (but simple) legal agreements that are clear on intentions and avoid minutiae.

Lesson number two: Be brave, know what your strategic edge is and leverage off slower and bigger companies ... but do this in a way that both sides benefit. If you do this well you can grow very fast.

(iii) Branding is important

It may sound odd, but one of the first things we did in Proteome Systems was to think about branding that would allow us to have a cohesive theme and positioning long into the future. We wanted to be recognised as one of the premium proteomics businesses, perhaps the defining company in our space. IBM, Coca-Cola, Mercedes Benz all extract extra value because of their brands, so why not Proteome Systems?

We partnered with a small Sydney graphic design company, Robinson Young. Paula Robinson helped us think through how we wanted to present ourselves to the world and she helped construct a consistent theme that has served us well as we have grown the business. Here is a great example of how strategic outsourcing can work extremely well for a business. Robinson Young have continued their association with us through the branding of our early products, our first advertising campaigns and recently, the preparation of the prospectus for our Initial Public Offering.

We pay a lot of attention to design in an industry that still mostly makes instruments that are “white boxes”. We are the “purple” company and a laboratory that acquires our technology enjoys its stylishness, compact design and functionality. Our products stand out and are readily identifiable.

Our logo is a bee and we have a honeycomb design with reference to protein chips. Why the bee? We are a life sciences company, and we wanted to give a sense of that. Why the honeycomb? It connects with the bee, and it also it evokes chemistry, a strong feature of our business.

Bees are industrious, they work together, they are adventurous (roaming far and wide to collect honey) and they make sweet stuff, which has curative properties. If you irritate them they sting. So many of the features of the humble bee apply well to our business.

Lesson number three: Build a global brand so that customers easily recognise your products and are drawn to them for design and aesthetics as well as performance. Build in character and culture so that clients get to know you and what your products stand for. Position yourself well; don't compromise on excellence.

(iv) Products, products, products

When we set-up Proteome Systems we were opening up a difficult area... the barriers to entry are very high as protein science has been the domain of the artisan, intent on emphasising difficulty and hence keeping it a small club. Our goal was to make proteomics accessible. To do that we had to simplify and develop products that work in the hands of a relatively unskilled user. Integration of a range of technologies was essential, as was developing an IT infrastructure to track workflows and make sense of large amounts of data. We relied on a very broad base of scientific experience to think through the scientific issues, but the real fun was to articulate these scientific ideas and turn them into products that were robust. The best way to know you have a robust product is to undergo the discipline needed to have someone purchase it!

These products are at several levels. Some are “merely” reinvention and integration of established technology to make it easy, accessible and part of an IT solution (eg ElectrophoretIQ^{3TM}, IsoelectrIQ^{2TM} and Xcise^{TM}). Our customers like what we have built because the products are easy to use, they work, they are IT enabled and they are backed up with our own quality consumables products.... the annuity stream of an instrument business.

IsoelectrIQ^{2TM} (Top) and ElectrophoretIQ^{3TM} (Bottom) — Protein sample separation and focusing instruments.

ProteomIQ™ Platform — Proteome Systems integrated end to end hardware and software solutions for proteome analysis.

While some of our products tidy up the past, it is clear to me that we should avoid where possible selling these new products as competitors of older products. We always try to open up new niches and avoid competing with the past. This way you have the opportunity to be the market leader and have the established players chase you!

ChIP™ — Chemical Inkjet Printer.

Other products genuinely break new ground. The best example here is an instrument which we call ChIP™ (Chemical Inkjet Printer). The idea of the ChIP™ is simple. Proteins are hard to work with because they are sticky and you lose them when you move them around. Andrew Gooley had the idea that we should array proteins by separating them from each other and then instead of moving them to chemical treatments (eg using microfluidic devices), we would bring the chemistry to the arrayed proteins. We do this using a nanotech printing device that involves a partnership with Texas based MicroFab Technologies. The concept is simple but no one had thought of doing it this way. This instrument was conceived and patented by Proteome Systems founders who reacquired the patent from Macquarie University (US patent granted in 2004) and the instrument was prototyped in Proteome Systems (supported by START and Shimadzu). Shimadzu manufactures this instrument. We believe that the ChIP™ will have a significant influence on the direction of proteomics.

Other products involve translation of product concepts from other areas (such as the finance industry) into the life sciences sector. It is surprising how some technology areas can miss out on innovation and become backwaters. We are all accustomed to data handling with fidelity through credit card transactions that happen worldwide without hassle. In the life sciences, even today most data is trapped on the instrument that generates it. It is difficult to manipulate the data, there is minimal disaster recovery, data stays in silos, it isn't easily scaled and can't be securely accessed at a distance.

Through our IBM partnership we are introducing products to the life sciences that are state-of-the-art with respect to information technology (eg as used in the finance sector). It is curious, however, how resistant some scientists are to accepting the IT revolution and the need to have instruments that connect to an IT solution... far too much data is still collected by pen and paper in the life sciences. The major challenge with our integrated products is to help scientists to understand that they do not need to try to build their own systems... I see this a little like trying to build a car from assorted, uncoordinated parts, rather than just buying the car. With sales of our integrated ProteomIQ product (with an IBM IT backbone) in the US, Japan and Malaysia, we are starting to see acceptance of these infrastructure products. There is even a chance that we shall sell our first ProteomIQ system in Australia in 2004!

Lesson number four: You win if you make useful products, but they have to be well marketed especially if they represent transforming technology.

More products: If you are selling technology, the best way to get people interested is to do remarkable things with it.... so we set out to solve some challenging biological problems using our technology.

One such area involves lung disease. The airways of the lung are lined with slimy mucus, which is hard to analyse. This is where the answers to developing a rapid diagnostic to tuberculosis lie. TB is a catastrophic problem for humanity... so we feel good about addressing it. There is currently no simple, rapid diagnostic device for diagnosing active TB despite a massive need for such a test. There are product opportunities at three levels: (i) in the developed world in the immunocompromised (AIDS), the elderly, and very young children ... here people will pay for a useful product; (ii) in the developing world (especially China and India, but also Eastern Europe and South America) there is an urgent need for good tests at a reasonable price... and (iii) in the underdeveloped nations (eg many parts of Africa) the need is desperate and cash lacking... but various foundations (eg WHO, Gates Foundation) will support products in this area. Hence this is a good space to work in. You can make money where there is affluence and at the same time develop products for those less fortunate. Using our technology we set out to find the markers that will make a 3 minute TB test possible. We are on the way with this project... and it is exciting.

I could tell several other stories of work done by our dedicated scientists in breaking new ground that will emerge as our products of the future.

Lesson number five: Downstream integration makes sense, particularly in emerging industry sectors. If you use the products you manufacture, you will know how to improve them and where to go next. We do this in the diagnostics and drug development areas. These areas are where the new opportunities lie and where the blockbuster biotechnology products of the future sit.

(v) Exports/Time zones

In setting up Proteome Systems, we began with a global view of the world and quickly established an international presence, especially in the major markets of Japan and the USA, while remaining clear that we are headquartered in Sydney.

People often ask how we can have a global technology business headquartered in Australia. There is an Australian view, one might even argue a predominant view, that the only place to headquarter a technology company is in the US. I heard it argued recently in Sydney that an Aussie biotech company needs a clear strategy from day 1 to move to the US. I find this a tad craven but perhaps in line with current political attitudes to the US. It hardly fits with the way Aussies like to think of themselves as being fiercely independent, slightly stroppy and not easily intimidated.

So let's dispose of the US as headquarters at the outset. I do this from a position of great fondness for America. After all, my partner (now an Aussie) grew up in America, my two youngest children have Aussie and US passports, and my eldest son, with a Harvard PhD in Mathematics, an American partner, and a Green Card is making movies in Los Angeles. But I am also just a little bit independent, maybe a little bit stroppy and certainly not easily intimidated.

Nokia (Finland) seems to have coped with its Finnish headquarters by being focused and clear about the superiority of its products in the mobile phone area; US based Motorola is on the back foot. Dominance in the aerospace industry has now clearly moved from the US to Europe and Boeing is on the back foot. Cochlear dominates the world bionic ear market, despite it being a Sydney-based Australian company.

Certainly, there are Australian technology companies that have done well by raising capital in the US and relocating headquarters there. ResMed and LookSmart spring to mind. However, I can think of a number of other companies in the biotechnology space where attempts to locate in the US were catastrophic, leading to either near death experiences or bankruptcy. One reason for this is that the US has a very different attitude to cash. Aussie companies locating in the US, hiring US senior

management and not paying attention to cash flows, may find their cash resources depleted in a way that is astonishing in Australia.

I think it is quite helpful to be headquartered apart from the big markets because it forces one to have a global perspective. Possibly the most important attribute for a company with global ambitions is to have a truly global perspective and the flexibility to act in the light of that perspective. From Sydney we view the world strategically in a way that our US managers have trouble understanding. They find it difficult to look beyond the US, especially towards Asia.

Because America is so inward looking, to capture the American market you need to have a US location (preferably both east and west coasts) and it is best to have Americans running it. This is what Proteome Systems does in the US and it is working. We have outstanding staff, respected in the industry, running our US operation. While headquarters for Proteome Systems is in Sydney, we work very closely with our US senior management. They travel to Sydney regularly as do we to the US (and our other global locations).

It is important to remember that the biggest market in the world is still only about one third of the world market. So where are the other markets and where is the growth?

The second biggest market in the world for technology is Japan. Some of the founders of Proteome Systems have been going to Japan for more than 20 years. We have done the hard work of building deep relationships with a number of major Japanese companies and this will stand us in good stead in the future. I suspect that Japan will continue to be our biggest market for some time and the US may never be as big a market for Proteome Systems as is Japan. The reason for this is that we are more patient than US companies and so we have a better entre to Japan. Simply put, we have the long term perspective needed to be successful in Japan.

The good news for Australia is that the other world markets that are undergoing rapid growth are in our time zone: China, India, Korea, Malaysia all have both the government and private sector enthusiastically growing their biotechnology industries (especially proteomics). Our region already represents about one third of the world's market and it is growing. Greater Europe represents the remaining third of the world's market, a region that we will get to in the near future.

I have heard it said that many Aussie companies start to think about entering markets in Asia when the US and European markets are off the boil. This is not how we see it. We think Asia is a very big opportunity for us. It is a market that we understand better than our US & European competitors. Proteome Systems Ltd has 22 nationalities on the payroll. It is a huge advantage to have native speakers from so many countries on staff. When we establish Proteome Systems in China it is very likely that we shall drive that business by sending one of our bright and energetic Chinese staff members back to China to run it.

Asia is where we have a big edge. Many Asians of my age trained in Australia and now occupy senior positions throughout Asia. In general, they have maintained connections with Australia and remember the country that they did their tertiary training in, fondly. Australia is not a superpower and that means we tend not to be threatening. Being a multicultural society, Australians are also tolerant of different cultures and likely to be understanding of cultural differences.

By choosing me to give this lecture this evening, the Warren Centre chose a work in progress. Proteome Systems is a young company, but we have already established an international presence in major world markets. I hope that our story gives some succour to other young Australian companies with aspirations to stay Australian.

The Warren Centre for Advanced Engineering

The Warren Centre for Advanced Engineering is the leading Australian forum for advanced engineering issues, recognised for its inclusive, forward-looking approach and the wide impact of its many achievements.

The Centre is a self-funding, independent, not-for-profit institute operating within the Faculty of Engineering at the University of Sydney, controlled by representatives from industry.

It has three principal objectives:

- to stimulate the application and further development of new engineering technology.
- to encourage the integration of innovation and engineering technology into the development of Australia's public policy and wealth creation.
- to provide independent comment and advice to government and industry on these and related issues.

The Warren Centre:

- identifies and supports major projects that bring together people at the leading edge in selected fields of engineering technology to develop new technical insights and knowledge in those technologies and accelerate their application in Australian industry.
- holds industry forums for companies in specific industry segments to explore opportunities of common or joint interest that will accelerate the development and/or exploitation of technology.
- organises events such as seminars, lectures and conferences that explore contemporary technology issues and disseminates the results of the Centre's activities.
- produces electronic and printed material to promote discussion and build awareness of contemporary, advanced engineering issues.
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The Warren Centre Innovation Lecture is an activity of The Warren Centre's Events Committee, aiming to promote understanding of new technologies and innovation and to encourage their use among Australian businesses.

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