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Science and Series

A Nation Worth Defending

News & Views - December 2002

The Parliamentarian and Support for Science. (December 31, 2002)

"Science Meets Parliament", the Federation of Australian Scientific and Technological Societies' annually sponsored get together for scientists and Federal Parliamentarians to have a chat came around again last month. Sydney University alumnus Professor Robert May, current President of the Royal Society of London and immediate past Chief Science Advisor to the Blair government, advised his audience of some 150 scientists to assume the Senators and Members of Federal Parliament are dedicated to broad national goals and have a sense of public duty and therefore his audience should eschew presumptions of narrow self interest on the part of the politicians they would be fronting.



Lord Robert May Photo:Peter Pockley

While expressing such views in the circumstances is understandable, it's is not particularly helpful. A few of the parliamentarians that were lobbied are ministers or shadow ministers, very few are in the cabinet; in short the vast majority are backbenchers, and within the Australian government, backbenchers have marginal effect on cabinet decisions -- with the understandable exception that allocations of resources for local projects are easier to come by for government backbenchers representing marginal electorates. This is really by way of saying that the majority of politicians must look out for the perceived more immediate requirements of their constituents, for example ameliorating the conditions resulting from the current drought or reducing the high percentage of youth unemployment in Sydney's western suburbs. To expect representatives to take an active, to say nothing of a proactive, interest in increasing support for say the enabling sciences is in the majority of circumstances unrealistic. In the case of federal senators because of the format for their election, there is a greater probability of their being prepared to take the broader view, however, as the Senate is a *de facto* chamber of review, backbench senators don't usually have a significant power base. While it is conceivable that a consensus of government backbenchers could prompt an increase in resources, were they able to convince cabinet the chances of remaining in power might be significantly diminished were support for research not markedly improved, such a scenario is unlikely.

What is necessary is that the Australian public be made increasingly aware of the steps being taken by our peer nations to markedly increase support for research and development while the federal and state governments begin to ask themselves why the governments of those peers have taken the steps to channel resources for R&D to equal 3% GDP by decade's end. Abrogating responsibility by declaring, "it's the fault of the private sector not us" exacerbates the problem while the Chinese government's recent initiative (see immediately below) to increase public support and understanding for science would seem to send a message.

From the Australian viewpoint the nation may ultimately pay a heavy price for sustaining populist government.

China Reported to be boosting Funds for Popularising Science. (December 31, 2002)

SciDev reports in its December 31st issue that China is to significantly increase its effort to bring support and understanding of science to the Chinese public. A

new package of policies to support science communication include plans to increase annual investment in the area by 10 per cent according to the report.

A shortage of appropriate personnel has frustrated popularisation of science in China. To correct the deficiency the Minister for Science and Technology Xu Guanhua said that the government would set up training centres in science communication and will sponsor research in the area.

How serious the Chinese government is in fostering this initiative remains to be seen, but it is interesting that the drive appears to be from the government itself rather than being a populist response.

Grote Reber, Builder of First Radio Telescope Dies Age 90 in Tasmania. (December 27, 2002)

The pioneering radio astronomer, Grote Reber, built the first substantial radio telescope dedicated to astronomy and placed it in his Illinois backyard. Reber was born in Chicago in 1911 and earned his bachelor's degree from the then Armour Institute of Technology (Illinois Institute of Technology). He went on to work for the US National Bureau of Standards in the late 1940's, before leaving for Hawaii and, ultimately moving to Tasmania to study the cosmos through gaps in the earth's ionosphere. He created the first contour radio map of the sky in 1944 and made increasingly detailed measurements having them published in such journals as *Nature* and *The Journal of Geophysical Research*.

His seminal radio telescope paved the way for the landmark discoveries of quasars, pulsars and the remnant glow left over from the Big Bang that were to follow.

President Bush Signs Measure (with strings) to Double NSF Budget Over Five years. (December 24, 2002)

The Bill, H.R. 4664, has placed into legislation the concept of doubling the budget of the US National Science Foundation (NSF), to US\$9.8 (A\$17.5) billion



by 2007. The point is now accepted by the Bush administration that it is vital that the imbalance of funds for the National Institutes of Health expected to be US\$27 (A\$48) billion this financial year needs to be redressed. However the caveat is that funding levels for the final two years will be subject to review by the Office of Management and Budget to determine how responsible the NSF has been in handling its budget allocation.

According to National Science Teachers Association's Gerry Wheeler, Bush made the point that as Texas' Governor he focused on literacy but now it's time for math and science.

The usually circumspect Bruce Alberts, president of the US National Academy of Sciences, was impressed by the "passion" for the idea of enlisting working scientists and engineers to strengthen public education.

* "African governments [must] develop as a matter of urgency" national policies on information and communication technology, and on biotechnology, "in order to realise the full benefits of these technologies". (December 24, 2002)

David Dickson in this week's SciDev reports on the conference held last month in Abuja, Nigeria involving science policy officials from more than 15 African nations. They put the matter bluntly emphasising that "political leadership -- not market forces -- is the key to the successful advancement of science and technology in Africa. According to Dickson, "The conclusion was endorsed at the end of a ministerial forum ...attended among others by the science and technology ministers of Algeria, Mali and Nigeria."

Understandably what is left unclear from the communique issued following the forum is the sort of discretion that will be exercised in the science and technology policy decisions to be made. In addition there is the suspicion that there will be an attempt to bypass building a solid foundation of fundamental science on which sustainable achievements in "information and communication technology, and on biotechnology" can be realised.

An Israeli View -- A University Is Not A Business (December 22, 2002) <u>Yair Censor</u>* writes, Any change in the management model of the universities must guarantee academic freedom.



Much was said and written as regards the management of Israel's universities, particularly following publication of the Maltz Committee Report in January 2000. It recommended changes to the organizational structure of the universities directed toward implementation of a business-like management model and submission of the whole system to an inflexible vertical management hierarchy.

Today in the universities, there exist in parallel, an administrative hierarchy (board of governors, executive committee, president, administrative vice-presidents) and an academic hierarchy (senate, rector, faculty deans, department chairpersons). They co-exist in various degrees of mutual dependence, which vary from one university to another according to the special character of each institution and according to the traditions and customs that have developed at each institution.

Submitting the whole system to a rigid vertical management structure, despite certain possible advantages, will necessarily result in great damage to academic independence. The proposed changes include removing the senate's power as the supreme academic authority, conversion of the rector to a vice-president for academic affairs without independent power, and many more. Such alterations will pave the way for the intervention by non-professional interests, both from within and outside the university, with regard to academic professional decisions such as programs of study, scientific promotions, development of scientific priorities, and even the assessment of students.

There is no universal model for management of research universities. Furthermore, some of the organizational recommendations of the Maltz Committee Report already exist in practice in some of Israel's universities. However, this does not prove the desirability of a universal and imposed implementation of all recommendations.

The achievements of Israel's system of higher education that were attained over the past 80 years with far fewer resources then those available to some of the leading universities in the United States of America, put in doubt the need to make extensive changes in the organizational structure of the universities. But even if we wish to make changes, the continuation of academic independence must be uncompromisingly guaranteed.

Academic independence is the soul and spirit of any research university; it requires

not only that external and non-professional interests do not intervene in academic decisions, but has yet another extremely important facet, the principle of the academic supremacy of the senate in the university. In protecting this principle, it is unacceptable that the management will unilaterally introduce changes in the organizational structure of the university that will have profound consequences on its academic activity. The consent of the senate, headed by the rector, is essential.

An attempt to enforce changes in the organizational structure without consideration of the academic system is a fundamental breach of academic independence. An attempt to enforce uniform changes in the organizational structure of all universities, as has been proposed by the Planning and Budgeting Committee, and already rejected by the Council for Higher Education, also carries a threat to academic independence and to the universities' ability to keep their place in the forefront of the scientific world.

As long as the universities are not only schools for the teaching of culture and knowledge, but also the fountain head of scientific research and cultural creativity, we must let them enjoy academic independence to the fullest extent. If there were a method of foretelling who will be the genius that will discover the next version of relativity theory, or the next visionary historian, then maybe academic independence would be less important. Because then we would have accurately predicted these geniuses and put at their disposal all the resources necessary for their development. Since, however, such is not the case, we must nurture a system with many degrees of freedom, both in its management and in the ways in which it adopts decisions. This system should not be managed according to a business-like administrative model. The flexible model of management is the appropriate way that will enable the blossoming of thought, cultural and scientific, and will increase the chances of far-reaching achievements.

*The author is professor of mathematics at the University of Haifa, Israel and chairperson of the Inter-Senate Committee (ISC) for the Protection of Academic Independence.

This article, translated by the author, was published in Hebrew in the guest article section of the *Ha*`aretz Daily Newspaper in Israel on Tuesday, December 17, 2002, page B2.

The Ha`aretz English Internet edition can be found at: http:// www.haaretzdaily.com.

To learn more about the Maltz Committee Report go to:

http://www.dest.gov.au/crossroads/sub1.htm

and choose submission number 34, or visit the ISC Homepage at: http://hyde.eng.tau.ac.il/ISC/

California's Universities Set to Take a King Financial Hit. (December 22, 2002)

A rapidly expanding budget deficit is set to cause substantial cuts in statefunded research programs, which will hit its state universities hard. California boasts nine universities which are members of the 63 member Association of American Universities, recognised as a group of the leading North American research universities. Six of California's nine are state institutions. Come January, California's Governor Gray Davis will propose chopping at least US\$29 million, roughly 10%, from the state's next research budget.

According to *Science's* December 20th issue, "Earlier this year, the California legislature imposed a US\$32 million cut on state-supported science at the nine-school UC system as part of a 10% spending

rollback for the fiscal year that began 1 July. Last week, the governor proposed taking another US\$18 million bite out of research as part of an extraordinary set of midyear cuts to higher education. And in January, Davis will propose another

round of cuts of at least 10%."

Joseph Miller, director of the Lick Observatory at the University of California, Santa Cruz says simply, "There's not much joy in finding misery elsewhere, but this problem is no longer unique to California." California's problems reflect the U.S. economic downturn, declining tax revenues, and an increased need for social services across the country. It remains to be seen just how and how well the state university system will cope.

Peter Pockley's *Science Show* Capsule Summary of the Year's Events as Regards Science Policy. (December 16, 2002)

The doyen of Australia's science reporters, Peter Pockley, was given 4 minutes 20 seconds on the ABC's December 14th <u>Science Show</u> to summerise events. Some excerpts:

...too much of the energies of researchers and administrators have been deflected from their core work to non-stop reviews and institutional defence.

All this effort has been without any guarantee of the increased funding needed for Australian science to become internationally competitive over the long haul.

But, recently, we've had a flurry of words from the government about its activities on the policy front. And there are some pointers that the tide is turning, even if slowly.

Brendan Nelson, Peter McGauran, their advisers and public servants have been markedly more cooperative and sensitive than their predecessors were to the concerns of researchers.

The Innovation Statement of January 2001 has started to kick in with some extra money. But, an analysis by the Group of Eight Universities shows this is only enough to stem Australia's slide, by international measures, of national support of research, and will not grow it. The weak point remains the government's inability to lift commitment by industry to R&D.

[The four national research priorities proclaimed by the Prime Minister] carry no connotation of national or commercial sensitivity and are expressed so broadly that scientists can rest easy. Virtually all lines of research currently supported by government match one or more priorities, and politicians will have no cause for carping criticism. After all, John Howard announced the priorities.

As for the key issue of universities, Dr Nelson says his plans for major reform are complete and, rather than prior assessment in Cabinet, they have been taken into the "process" for the Budget next May. Until then, universities, like CSIRO, are left in limbo. Further, Nelson warns that, with the competition for funding from domestic security, etc, universities may have to wait to 2004 for much relief.

All things considered, you might say the government's representatives don't interrupt, speak softly most of the time, and have the nation's research, development and higher education sectors essentially marking time while the rest of our cohort marches on. Gives one a nice warm feeling for Christmas:

while we're tucked up in our beds, visions of sugar plums dancing in our heads.

Rectors of Italy's 77 State Universities Resign. (December 15, 2002)

The Journal *Science* reported in its December 13th issue that the rectors of Italy's 77 state universities this week resigned en masse to protest government plans to cut budgets and freeze hiring. Their intention is to send a strong message to the Italian parliament which is in the throws of debating plans to cut spending at some universities and research institutions by up to one-third. If the Italian government gets the message the resignations can still be withdrawn.

The rectors want parliament to restore budget increases promised by previous governments or at least minimize cuts, which gives considerable scope for discussion and compromise. Clearly the rectors decided it was advisable to launch a preemptive strike rather than wait for the final budget decision which would mean they were challenging a *fait accompli*.

Report Urges National Science Foundation to Up its Support for Research Infrastructure to Maintain U.S. Leadership in Science. (December 12, 2002)

Professor John White, chancellor of the University of Arkansas, and chair of the National Science Board task force that produced the report *Science and*

Price range (in millions)	Bio	Comp.	Educ.	Engin.	Geo.	Phy Sci	Polar S	Social	Total
\$1-10	1600	600	650	500	100	100	100	300	3950
\$10-50	1600	800	400	700	900	500	300	200	5400
\$50-250	600	1000	0	1000	1800	2000	400	0	6800
\$250-500	0	500	0	0	0	900	300	0	1700
\$500+	0	0	0	0	0	1000	0	0	1000
TOTAL	3800	2900	1050	2200	2800	4500	1100	500	18850

A Decade of Needed Facilities

Midsized crisis. There's a growing need for moderately priced facilities.

Engineering Infrastructure For the 21st Century: The Role of the National Science Foundation says simply, "The need [for the National Science

Foundation to significantly

increase its

support for

research

infrastructure] is greater than we can address with our normal budget mechanisms, and it won't go away." The 41 page report states the NSF would have to triple its annual spending on large research facilities--to US\$350 million--just to eliminate the backlog of approved large facilities. In addition there's also a shortage of "midsized" facilities (see table)--those costing tens of millions of dollars that are unaffordable for individual programs but too small to rank as a major research installation. A comparable analysis ought to form part of the study the Minister for Education, Science and Training, Dr. Nelson is to undertake as, "a major exercise to take stock of the state of Australian science by mapping science and innovation activities across the public and private sectors." It's a matter of defining "major exercise".

Nature Somewhat Patronisingly Evaluates the Australian Government's Announcement of Research Priorities. (December 12, 2002)

Last week's promulgation by the Prime Minister, John Howard, of Australia's research priorities of :

- an Environmentally Sustainable Australia;
- promoting and Maintaining Good Health;
- frontier Technologies for Building and Transforming Australian Industries; and

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engendered the lead editorial in the December 12th issue of *Nature* accompanied by Carina Dennis' report. Not to place too fine a point on it, somewhat patronisingly we are essentially told that all things considered it's about what one might expect of a cripple (sorry, egocentric, and economically and physically challenged corpus). *Nature* put it this way: "in a landmass nearly the size of the United States and occupied by fewer than 20 million inhabitants, Australia's research community suffers not so much from a tyranny of distance as one of scale. Australian science takes pride in wringing high-quality research from scant resources. Despite increases in government funding over the past two years, industrial support for research remains scarce, and Australia's universities are cashstrapped. Now it risks slipping further behind as the price of research rises and the United States and Britain bolster research funding to levels that dwarf Australian investment."

That sounds like code for, "not good enough but don't worry about it you're never gonna be in the race." But oughtn't we to be compared with Canada, Switzerland, Ireland, Finland and the overall aspirations of the European Community nations? On the other hand it's an understandable conclusion when Professor Vicki Sara, chief executive of the Australian Research Council says, "There is a problem with fragmentation in Australian research, and the challenge will be pulling people together," and our Chief Scientist, Dr. Robin Batterham tells Ms Dennis that the prioritisation will not be accompanied by any increase in funding. He hopes, however, it will help foster more research collaborations, and that these will be further encouraged by the audit of funding which the Department of Education Science and Training will conduct in the coming year. Conjures up a picture of a shivering cohort forced to huddled together under a thin blanket in order to keep warm -- distinctly constrained while avoiding freezing to death. What was that comment? "Now it risks slipping further behind as the price of research rises." Come to think of it, it's probably just sour grapes because we're thrashing them at cricket.

Those 2000 Research Chairs Mean Brain Gain for Canadian Universities. (December 11, 2002)

"All of a sudden, Canada is getting pretty hot, and we're not used to that," says Canadian Foundation for Innovation president David Strangway, recounting a visit

to Australia in which science officials there told him they "are losing people to Canada because of the things going on there." So reports *Science* in its December 6th issue. So *what* is going on there. Nothing that hasn't been in the news for the past three years and should have been a wakeup call to Australians -- politicians, educators,



entrepreneurs, and anyone else who ought to have an interest in Australia's well being. In the latest round 123 chairs have been funded through the <u>Canada</u> <u>Research Chairs (CRC) program</u>. Of those, 43 (35%) will go to foreign-born or expatriate academics. Previously, there had been 85 of a total of 623 chairs that came from outside Canada (13.6%). The CRC program has been running something under three years and initial emphasis was placed on providing inducements to retain Canada's best, *i.e.* stopping the brain drain. Having plugged the drain, the focus for recruitment has shifted to overseas, hence the cold northern blast being felt in Australia for example.

One of the cornerstones of the program is the requirement for each university to enunciate a strategic plan. *Science's* Wayne Kondro reports, ""The idea is to get them to grow a critical mass, as opposed to growing in all sectors,' says Marc Renaud, president of the Social Sciences and Humanities Research Council and chair of the CRC steering committee. "The more you showcase yourself as the best in an area, the more likely you are to attract students and funds."" Or as Alan Bernstein, president of the Canadian Institutes of Health Research puts it "Research is all about critical mass, it's all about having [people] down the hall you can talk to."



Of course you don't get this impetus without adequate funding. The Canada Research Chairs program has been provided with A\$1,030 million to support the establishment of the 2,000 Research Chairs in universities by 2005. Looks like the "Celtic Tiger" is getting a "Canadian Snow Leopard" for company. It remains to give the "Boxing Kangaroo" some punch in the

international ring so that we don't read, "recounting a visit to Australia ...science officials there told him they 'are losing people to Canada because of the things going on there."

²University of New South Wales' Martin Green to Receive 2002 "Alternative Nobel" Prize. (December 6, 2002)

The **Right Livelihood Award**, known generally as the "Alternative Nobel" is



awarded annually "for outstanding vision and work on behalf of our planet and its people". The winners, announced in October, will be formally presented with their awards in Stockholm at a ceremony in the Swedish Parliament on Monday (December 9), the day before the Nobel Prizes are handed out. The Right Livelihood Award is shared this year by four recipients, two

organisations working for conflict resolution and healing - Centre Jeunes Kamenge (Burundi) and Kvinna till Kvinna (Sweden) - and two individuals - human rights activist Martin Almada (Paraguay) and Australia's Martin Green. Professor Green, co-winner of the 1999 Australia Prize, receives an Honorary Award, which is given to a person or group whose work the jury wishes to recognise but "who is not primarily in need of monetary support." The others share the prize money of 2,000,000 Swedish kronor (A\$384,000). The announcement of Professor Green's work reads,

Professor Martin Green of the University of New South Wales, Australia, receives an Honorary Award. Professor Green is the world's foremost researcher and inventor in the field of solar photovoltaic (PV) technology. The Jury acknowledges him "for his



dedication and outstanding success in responding to the key technological challenge and moral imperative of our age: the harnessing of solar energy".

Yesterday Professor Green, in Stockholm for the ceremony, was reported by *Newsday* to comment, "I saw the challenge of finding some way of tapping into a small amount of this energy to convert to a form that could be useful in promoting human life as we experience it."

[The Right Livelihood Award was founded in 1980 by Jakob von Uexkull, a stamp dealer who sold his collection to fund a program to recognize work that he believes is ignored by the Nobel Prize committee.]

Prime Minister Announces Australia's National Research Priorities. (December 5, 2002)

Following a gestation period of seven months the Prime Minister, John Howard, today announced four overreaching <u>national research priorities</u>. Mr. Howard has dot-pointed the following four categories:

- An Environmentally Sustainable Australia;
- Promoting and Maintaining Good Health;
- · Frontier Technologies for Building and Transforming Australian Industries; and
- Safeguarding Australia.

The devil will of course come with the detail and how that will be addressed will unfold over the next six to nine months. The two paragraphs, immediately following the priorities' listing are noteworthy:

> These priorities are aspirational in nature and will be recognised by all Australians as areas of endeavour that will help to deliver the kind of future we want.

> Equally important is that a focus on excellence will underpin success in these priority areas. A broadly based and high quality research system that pursues excellence, particularly in the enabling sciences, remains fundamental. [emphasis ours]

According to Mr. Howard, "In the first instance the government has left it up to all Commonwealth research and research funding bodies to submit plans to the Government by May 2003 outlining how they propose to support the four priorities." This follows on his detailing the Minister for Education, Science and Training, Dr. Nelson, to undertake, "a major exercise to take stock of the state of Australian science by mapping science and innovation activities across the public and private sectors." In both cases it will be interesting to follow how broadly, how deeply and (to borrow an observation of Sir Humphrey Appleby) how courageously these instructions are interpreted and implemented. To cite but three areas that ought to require reevaluation:

- 1. what affect will this announcement have on how the Australian Research Council will divide its funding between basic, strategic and applied research,
- 2. what will be the effect on the manner in which CSIRO will utilise its public funding and its Chief Executive's "stretch goal" of obtaining 50% external funding, and
- 3. how will the policy document on reforming higher education that Dr. Nelson is to present to Cabinet reflect the government's "aspirational priorities", particularly in the light of the concept that "a broadly based and high quality research system that pursues excellence, particularly in the enabling sciences, remains fundamental."

Of course if we're not talking additional resources commensurate with that of our peer group nations, forget it; we're into national rhetoric not national priorities.

Robert May on *Innovation: from new knowledge to new products.* (December 2, 2002)



Last month the President of the Royal Society and immediate past Chief Scientific Advisor to the British Government came home for a brief visit. Among other appearances, Professor May gave the keynote address "Owning Innovation – From Idea to Delivery" to the 2002 Symposium of the Australian Academy of Technological Sciences and Engineering. His 730 word text on

Innovation... was first published in the *Canberra Times* and has been made available online by <u>ON LINE opinion</u>. What he said has been said before but its importance stems from who said it.

Our daily lives, at home, at work and in the marketplace, have changed hugely over the last 50 years. ...The dominant driver for such changes has been new knowledge, and its translation into new ways of doing things. ...The interaction between new knowledge and new products is complex and often far from straightforward. But the UK Government's White Paper on 'Excellence and Opportunity: a Science and Innovation Policy for the 21st Century' [340K], published two years ago, provides some useful pointers.

It suggests that "to be a successful nation we must make sure our science base is strong and excellent, that we have the facility to quickly transform the fruits of scientific research and invention into products and services that people need to improve their well-being and quality of life, and we must do all this in a way that has public support and involvement"

Professor May goes on to strongly advocate giving the young scientists and innovators their head reducing the deferential strictures on their rite of passage. And as regards public investment "such investment produces successive cadres of trained young people, some of whom are cycled back into the knowledgeproducing process, while others carry its fruits out into business, industry, the City, public service, and elsewhere.

In addition he discusses the importance of getting academe and industry to gain a greater understanding of each others needs, the importance of the knowledge producers considering the ethical issues involved in what they are doing and points out that "governments invest in basic science to gain new knowledge thus created [and while] new knowledge is a classic 'public good', the producing country or organisation does usually enjoy potential advantages in acquiring it first, as economic studies have shown [and also] to buy a ticket into the wider club of knowledge-producers."

Canada's Universities and the Canadian Government Strike a *Quid Pro Quo*. (December 1, 2002)

Canadian Minister for Industry Alan Rock put it simply, "I wanted [the academic institutions] to commit in principle to a link between public funding and economic outcomes." Somewhat more specifically what this means is that Alan Rock has reiterated the government's pledge to double its contribution for research and development by 2010 to A\$16.5 billion (A\$10 billion on an Australian per capita basis) and has committed the government to defraying overhead costs associated with publicly funded research to a permanent funding program in next

year's federal budget. In return the Association of Universities and Colleges of Canada (AUCC) agreed to "a doubling of the amount of research performed by universities and a tripling of commercialization performance" over the same period of time. Just what benchmarks will be set is yet to be determined but according to *Science* (29 November 2002) "Several administrators note wryly that tripling commercialization output shouldn't prove too great a challenge, given that the current base is so low."

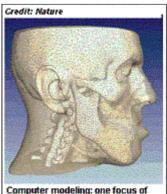
Somewhat surprisingly Alan Rock doesn't anticipate too much difficultly selling the package to his cabinet colleagues, "How are we going to be able to afford all this?" He asks rhetorically, "The answer is of course innovation; if you innovate ...your economy performs better ...the revenue increases and you're able to do more."

You get the impression that perhaps in some respects Jean Chrétien's government may be looking a bit beyond the next election.

Berlin Gets Numerate in a Big Way. (December 1, 2002)

Over the next four years the Berlin based DFG Research Centre for Mathematics for Key Technologies will receive 8 million euros. As spokesman for the new

centre Martin Grötschel says simply, "That's big money for mathematics," and went on to say that Any concern that the new centre's emphasis on applications will be at odds with fundamental research is unfounded, "Modelling common problems in industry, banking and science will require new algorithms, this will trigger a loop of research that is equally beneficial" for theoretical as well as practical mathematics.



the new Berlin maths centre.

The University of Melbourne's Jan Thomas, Executive Officer of the Australian Mathematical Society points out, "The new mathematics centre in Berlin epitomises the new mathematics war. Usually wars in mathematics

revolve around how it can be taught in schools, and what should be in the curriculum. The new war is about attracting a limited pool of talented mathematicians to national centres to support nations' science and technology base."

Dr. Thomas adds,

Australia is losing badly in this war. Having lost many of its best researchers to other countries, it is still failing to invest the kind of money the Berlin centre has A\$14.3 million per year in research and State funds. The recently established Australian Mathematical Sciences Institute has A\$1 million from the Victorian Govt over three years and a (so far) one-off grant from the Federal government of A\$181,000. Australia is in this war with bows and arrows, trying to shoot down guided missiles.

It is possible that the new Centres of Excellence and the Priority setting exercise will target this fundamental discipline. However, Australian mathematicians are still battling on another front. From the reports I heard from the Centre of Excellence interviews held recently, the emphasis is still on instant and measurable results. Those in charge of the Berlin centre seem to be well aware of the need for strong theoretical and practical mathematics. That they were funded indicates that so are the German funding bodies. Australian mathematics desperately needs this enlightened thinking in the funding bodies.

It's understandable that there is a feeling abroad in Australian academic circles that there is a lack of comprehension by the government as to the extent of what its cohort of nations is working toward. Its ministers look sideways and backwards rather than forwards, an excellent recipe for tripping up.

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