AMSI News

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What can mathematics gain from recent government initiatives?

In the Federal Budget papers for 2009–2010, there are no specific initiatives for mathematics. The word 'mathematics' appears only once[1], within a package of HECS HELP that has now been extended to all sciences, as well as nursing and teacher training:

> Consistent with the Government's ongoing interest in supporting critical skills needs, the HECS HELP benefit that now applies to eligible mathematics, science and early childhood education graduates will be extended to nursing and education graduates who take up nursing and education occupations.

The Budget provides a welcome boost to science infrastructure, by $901 million. Mathematics, more than most other disciplines, should be well placed to receive spin-offs from significant boosts in infrastructure to other scientific disciplines such as marine science, meteorology, space science, biotechnology and nanotechnology. At the forefront of each of these disciplines, one finds interesting mathematical problems. Mathematical scientists, more than others, are required to adapt their skills to collaborate with other disciplines. Mathematics departments have no choice but to do this if they are to regain a presence anywhere near as strong as that of 30 years ago. That does not mean that the discipline should lose its own identity. The solution of difficult mathematical problems, even those that arise in applications, requires extensive specialist training as well as the self-discipline required in rigorous research.

In much less than a year, AMSI has brokered 12 agreements between universities, outside employers and postgraduate interns[2]. This is just the kind of collaborative activity encouraged by Terry Cutler, author of the government-commissioned 2009 report, *Venturous Australia: building strength in innovation*, a review of Australia's innovation system. The AMSI Internship program has been partly sponsored by a grant from the Collaboration and Structural Reform Fund, now replaced by the Diversity and Structural Adjustment Fund of DEEWR.

Diversity, breadth of opportunity and regional access to higher education are strong themes in the 2009 report of the Bradley Review, *Transforming Australia's Higher Education System*. From personal experience, shared by many of my colleagues, nothing empowers working-class kids more than a rigorous school mathematics education. With the stated aim of having 40% of young adults graduate with degrees, the schools need to lift their aims in mathematics education. The National Curriculum Board's mathematics writing team of ten (including Michael Evans and

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[1]Australian Federal Budget Papers. 4. *Future Directions for Higher Education*
[2]See http://www.amsi.org.au/Industry_internships.php

Janine McIntosh of AMSI) and its larger directing team (including Peter Stacey as a university mathematician), has an opportunity to make a real improvement. Even if the new school curriculum succeeds, university teaching departments will need to re-tool to cater for a broadening range of student needs.

In previous columns, I have given many examples of AMSI's efforts to demonstrate the value of the mathematical sciences in many other fields of endeavour. However, unlike bricks, mortar, telescopes and fowl houses, mathematical expertise is not given due recognition as an important infrastructure for scientific and economic development. Mathematics has been a proud discipline in its own right over several thousand years of intellectual stimulus. Some bureaucrats of the 21st Century dare to question its status. Even as I write, a review by management in one of our member universities is proposing to destroy their only internationally recognised mathematics activity. In Russia, such cultural Philistines were likened by V.I. Arnold[3] as Krylov's fabled pigs under an oak tree, 'both eating the acorns and digging up its roots'. It would be easy to be dismissive of them except for the fact that they hold the purse strings.

Director of AMSI since 2005, Phil Broadbridge was previously a professor of applied mathematics for 14 years, including a total of eight years as department chair at University of Wollongong and at University of Delaware. His PhD was in mathematical physics (University of Adelaide). He has an unusually broad range of research interests, including mathematical physics, applied nonlinear partial differential equations, hydrology, heat and mass transport and population genetics. He has published two books and 100 refereed papers, including one with over 150 ISI citations. He is a member of the editorial boards of four journals and one book series.

[3]V.I. Arnold, *Innumeracy and the Fires of the Inquisition*, Izvestya, 17 January 1998.