

Australian Maths No Longer Counts

The decline of Australian mathematics is bad news for Australia's future, says Peter Hall.

The mathematical sciences in Australia are in steep decline. In some fields the fall is precipitous. My own, statistics, is a case in point.

The shortage of statistics graduates in Australia is so acute that it inhibits foreign investment. It prompts private companies and government departments alike to plea with the Commonwealth for a fix.

There is no respite on the horizon. The number of mathematical scientists working in Australian universities is today about 65% of what it was in the mid-1990s. The number of Honours mathematics and statistics graduates in the 5 years from 1997 to 2001 was three-quarters what it had been in the previous 5 years.

There are now only three statistics departments remaining in Australia. Fifteen years ago there were at least three times that number, when the demand by employers for trained statisticians was far less than at present.

"Backing Australia's Ability II," announced in May, might give Australian science a chance to arrest the overall decline but earlier funding formulae, which will remain in place, will prevent a proper distribution of new resources to the mathematical sciences.

Does this matter? Only if Australia wants to be internationally competitive, to expand its economy and to offer its citizens security in an increasingly dangerous world.

The security side is a fascinating one. It's a part of the mathematics

iceberg that is well under the surface for most Australians even though mathematics is the driver of modern security technologies.

General W.E. Odom, a former director of the US National Security Agency, put it this way: "While serving as the director ... I realised that world-class mathematicians devoted to cryptology and cryptanalysis were critical for success".

More generally, the mathematical sciences fuel innovation and growth. Virtually all contemporary technologies, especially those in which Australia is endeavouring to gain a foothold (e.g. bioinformatics and information & communications technology) have the mathematical sciences at their heart. As a result, mathematics and statistics are today not just the language, but the culture, of economic development and scientific innovation.

There has never been an era when society, as well as scientists, needed as many mathematical skills as it does today.

An appreciation of these truths foreshadows a time of substantial difficulty for Australia. We're not producing enough mathematics teachers for our schools, and our universities are not training enough mathematicians and statisticians to meet the demands of industry and government.

The reduction in the number of mathematical scientists working in Australia is principally due to mathematicians leaving for abroad. The



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Prof Peter Hall photographed while a visiting professor in Norway.

migration has been at all levels, including the most senior ones.

For example, during 2002 and 2003 we lost Vikram Krishnamurthy (a particularly gifted stochastic analyst) and Nick Wormald (an especially strong combinatorialist) to Canadian Research Chairs. Australia's Federation Fellowship scheme has not kept such top-flight mathematicians in the country.

Recent state and Federal initiatives support some new activity, such as the Australian Mathematical Sciences Institute, but fee and funding formulae make further gains extremely difficult. For example, fees for multiple degrees and diplomas discourage mathematics graduates from becoming teachers.

Current funding regimes provide strong disincentives for statistics and mathematics courses in universities, and also discourage universities from supporting research in those fields, since grant incomes there are low. In fact, funding problems are knocking the mathematics legs from under Australia's future.

Peter Hall is Professor of Statistics at the Australian National University and has just completed his term as Chair of the National Committee for the Mathematical Sciences. *conScience* is a column for Australians to express forthright views on national issues. Views expressed are those of the author.