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Mathematics and Statistics: Critical Skills for Australia's Future
containing the findings and recommendations of the National Strategic Review of Mathematical Sciences Research

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(speaking as Chair of the National Committee for the Mathematical Sciences of the Australian Academy of Science and as Chair of the Working Party for the review)

Welcome everybody I'm really delighted to see so many people that have come along today. I'm. Hyam Rubinstein, the chair of the working party for this review and we're here today to talk about the launch of the mathematics and statistics national review - critical skills for Australia's future. So what I'm going to do is to start with a very brief discussion of the review in a very fast way; I really recommend to you to read it. I think it's a great document, extremely readable, full of very interesting information. So just a little bit about the history is that the body carrying it forward has been the national committee for mathematical sciences and Peter Hall who was the previous chair of the national committee was very active in raising issues about problems of mathematics and statistics. He wrote a proposal to the Australian Research Council through the Academy of Sciences to fund this review. So we really appreciate Peter's efforts in getting the review going and there's been a wonderful team working away very hard a whole year on this and I'll say a few words at the end of today's proceedings thanking all the people involved. I think it's been a fantastic team effort.

The review is being supported by the four professional societies representing the mathematical sciences and the Australian Mathematical Sciences Institute. So it has really been a very good cooperative effort. Next a few words about what the review has found - so what are the basic issues. First of all the good news is that mathematics and statistics are involved in a huge range of activities from mining to manufacturing, from financial services to medical services, to looking at problems in the environment. Mathematicians and statisticians are extremely active around Australia, so there is a lot of very interesting work going on and I think that it's fair to say that the international reviewers were impressed at the level of engagement of mathematicians and statisticians. And also of course, the excellent work going on in the CSIRO Division of Mathematics and Information Sciences, DSTO, and the Australian Bureau of Statistics. These are large organisations that play a key role in Australian society and the Australian economy. So there are a lot of interesting stories that are worth having a look at, but what I also want to talk about are the problems. Note that mathematics and statistics internationally are flourishing and there are extremely exciting things going on, particularly in inter disciplinary areas, where for example in biology, genomics is throwing up a whole lot of new problems that mathematicians and statisticians are involved in.

In Australia things are not going so well, so some of the key points in the review are that for example just in the GO(8) departments, the eight largest departments that are doing most of the research training in the country, since 1995 the date of the previous review, the number of permanent staff have dropped from around 360 to under 250. So we have lost

110 positions out of 360 in ten years in the leading departments around the country! Now I think this is a really alarming situation and moreover, it is absolutely clear that next year the numbers are going to drop by a further 10 to 20 at least, maybe more. So I think this is a situation, which needs to be addressed urgently. To procrastinate would be disastrous. Another piece of information, to indicate how serious the problems are, is that Australia produces 40% of the OECD average of graduates of mathematics and statistics as a percentage of the university cohort. To put it another way, in the OECD the average is around 1% of university graduates are in mathematics and statistics, while in Australia it's 0.4%. Now this is leading to a situation where there are shortages illustrated by reports from a number of people in industry, from CSIRO, from the Antarctic division, from various other groups, where groups are unable to source the types of mathematical sciences graduates that they want.

In the mining area industry is looking at going offshore for mathematics expertise, because they cannot find the expertise within the country and statistics is in really a difficult situation. There's a global shortage of statisticians and so the fact that the university departments are declining is extremely worrying. And finally I think in terms of industry linkage, infrastructure and support for collaboration, there is some good news which is that the departments have worked together to produce the Australian Mathematical Sciences Institute, and AMSI is doing a lot of very interesting things, but it's been basically supported by the departments. There is some money from the Commonwealth for mathematics education, but in terms of research, industry linkages etc, this is all being financed by departments that are not in good shape. So what we are asking for, in terms of recommendations; the first key recommendation is to improve the way mathematics and statistics are funded within the universities. Currently the departments are really not viable, there is no other way to describe the situation. Unless there is a change we're going to see mathematics and statistics departments really go out of business. And so you can see with the sort of decline that's happening, that this really needs to be addressed urgently, so the review recommends action in that area. And the other priority, in terms of national infrastructure, is to have a modest amount of money to support national research, and at the moment we have the Australian Mathematical Sciences Institute, so to properly fund AMSI so that in the future we may be able to expand further our national research activities.

When one just looks around the Asia-Pacific, Singapore, Korea, Japan, China, even New Zealand have thriving well-funded national research institutes that coordinate activities within their countries. And so we really need something like this in Australia. That's just a very quick summary of what the review is about and the main findings. I really recommend to you to please take a copy, have a read of it and see what you think.

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