
Foreword

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It is our great pleasure to write the foreword to this special issue of *New Zealand Science Review*, which is the first of two dedicated to *Mātauranga and Science in Practice*. These landmark publications provide a timely contribution to ongoing dialogue about what a distinctively Aotearoa New Zealand science system should look like, informed by the research and experiences of those working at the nexus of mātauranga and science. There is much to learn from them.

Like many other countries, Aotearoa New Zealand is confronted with enormous environmental, societal and technological challenges that require our scientists and researchers to go beyond the ordinary. Māori are often at the pointy end of these challenges but are unlikely to be in positions of power to define and drive responses. This needs to change. We need multiple ways of thinking, knowledge systems and approaches to understand and respond to complex challenges including climate change, food insecurity, biosecurity, health inequities, poverty, and the disruptive impacts of digitalisation. This means investing in our comparative advantages, making the most of the opportunities that they present, and enabling communities to contribute to solutions.

The interface of science and Indigenous knowledge is an obvious area where Aotearoa New Zealand is genuinely unrivalled. Mātauranga Māori – defined as Māori knowledge, Māori methods of knowledge creation, and Māori ways of knowing (Mercier & Jackson, this issue) – is the Indigenous knowledge system of this land. Mātauranga has survived and evolved as a dynamic and generative knowledge system despite extensive efforts to expunge it through legal, social and political means (Simon & Smith 2001; Smith 1999; Ward 1995). The vision, crystallised in this issue, is for mātauranga to flourish again and to create collective benefit in ways that are context-appropriate and acceptable to Māori.

We have solid foundations on which to build. The significance of mātauranga in the Aotearoa New Zealand science system, including through the Vision Mātauranga policy (Ministry of Business, Innovation and Employment 2018), has few parallels in other countries. Thanks largely to the incredible commitment of Māori leaders, there are significant cohorts of Māori PhDs and sufficient Māori Principal Investigators to ‘fill an Air New Zealand Airbus A320’ compared to a telephone box 20 years ago (Ruru *et al.*, this issue). The achievements of Ngā Pae o te Māramatanga in this regard is stellar, with hundreds of Māori PhD graduates emerging from this Centre of Research Excellence. Increasingly, Māori researchers operate comfortably in two or more knowledge systems and are adept at interfacing mātauranga with diverse disciplinary knowledge. Working across knowl-

edge systems requires an intellectual flexibility that provides a space for innovative thinking to ‘expand the intellectual scope of our nation’ (Walker 2005). The papers in this issue that describe efforts to build capacity and capability are inspiring, emphasising the focus on ensuring veracity and rigour as part of teaching practice. It is a pleasure to see the mātauranga–science interface blossom with a focus on the future. The Prime Minister is personally supportive of this kaupapa and is supporting two internships to undertake a future-focused project centred on Te Tairāwhiti (<https://www.pmcsa.ac.nz/2019/10/08/we-are-excited-to-announce-two-new-internships-to-complete-a-tairawhiti-centred-project/>).

However, as this issue reminds us, there is still much to do. One of the barriers is an inadequate understanding of mātauranga within the broader science community. The question of whether there is such a thing as ‘Māori science’ pops up from time to time and the ensuing debate is often less than constructive. The measured account of this debate from Georgina Tuari Stewart and her answer: ‘there is no right or wrong answer to the question of Māori science and the question can never, therefore, be considered fully settled’ is both insightful and challenging. It challenges readers to be comfortable with incommensurability, provides a useful way of coming to that conclusion and inspires exploration of the interface of orthogonal knowledge systems. Here it is instructive to reflect on Tā/Sir Mason Durie’s (2005) observation that, just as Indigenous knowledge cannot be verified by scientific criteria, nor can science be adequately assessed according to the tenets of Indigenous knowledge. Rather, ‘Each is built on distinctive philosophies, methodologies and criteria’. Contests about the validities of the two systems distract from ‘explorations of the interface’, and the ‘subsequent opportunities for creating new knowledge that reflects the dual persuasions’ (p. 2).

Tuari Stewart’s paper underscores the inherent power imbalance between mātauranga and science, and the wrongheaded sentiment that one has to claim features of the other in order to gain legitimacy and resource. It also cautions against a reductionist approach that would view mātauranga solely as an ‘input’ into science solutions, or as supplementary to ‘real’ scientific knowledge (Broughton & McBreen 2015), which detracts from the opportunities that solving problems using dual knowledge systems might provide.

This issue also shows how much science has to learn from mātauranga and kaupapa Māori approaches. The latter approach of embedding practice in society and grounding the project in a community of acceptance before it starts, is the very model of ensuring impact and connectivity. Often those trained in Western traditions, however fine, struggle to grasp this until it is perhaps too late. How many technologies will be developed in isolation before we learn that we need to engage our publics sooner, not later, to make sure there is cultural license to proceed? To turn the tide on anti-science sentiment we need to reframe our science as ‘here to serve’, and ‘here to listen’. Science in Aotearoa

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New Zealand, and indeed the world, has much to learn from Māori ways of doing, as well as ways of knowing, to bridge these divides. The Hepburn paper describes this beautifully in their comparison of scientific process and community-led decisions. And this blurring of benefit, participation and knowledge is eloquently described in Ruckstuhl and Marti's piece. Those trained in Western traditions might dismantle this way of working as not 'pure', hypothesis-driven science, but this unpicking presents no advantage for understanding and harnessing a knowledge system that was not designed as such, and has no desire to meet this particular abstract (and yes, undeniably powerful in other contexts) ideal. Why not see what advantages it might bring to the practice of using knowledge to make te ao hurihuri better for all? Why not complement science's great reductionist strength with more holistic thinking, and see what we find at the interfaces? In short, scientists may get further by stepping off their self-appointed pedestal and listening to other views and other ways of knowing in order to retain and regain societies' trust. In so doing, let's make the most of our excellence in 'arguably one of the newest research fields on the block, albeit with ancient veins' (Smith 2018, p. 22).

Finally, we wish to thank the Editors, Ocean Mercier and Anne-Marie Jackson, for the opportunity to reflect on this special issue. As remarkable wāhine Māori working at the mātauranga-science interface, both have worked tirelessly to uphold the mana of mātauranga in a system that has often been less than welcoming. This impressive collection of papers is a testament those efforts.

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