

nerd nation by jenny nicholls

BRACE FOR IMPACT

A government “discussion paper” is alarming New Zealand scientists.

“If we knew what it was we were doing, it would not be called research, would it?”

– Albert Einstein

It slipped into email inboxes on June 26, and the upbeat government Twitter feed on June 30. “We’re seeking feedback on a discussion paper examining the concept of impact as it relates to the science system,” chirruped @MBIEsci, the official Twitter handle for New Zealand science policy and investment.

The discussion paper turned out to be a 47-page document called “The Impact of Science”. It had no visible author, was signed “The New Zealand Government”, and has sent shivers through some of the brightest stars of New Zealand science.

The paper surely emanated from the capacious guts of 15 Stout St, Wellington, a building that looks, on the outside, like a vast block of art-deco cheese. Inside, an architectural magazine reports, 21,000 square metres of refurbished floor-space is designed to support 1800 staff, their spirits lifted by a soaring, refurbished, light-filled atrium. The building – “the scale of an ocean liner” – is home to the mighty MBIE: the Ministry of Business, Innovation and Employment. Those 1800 worker bees oversee a range of state activity, from immigration and social housing to the New Zealand Cycle Trail.

As MBIE also funds much of New Zealand science, the ministry’s paper attracted nervous interest from universities and other “stakeholders” dependent on MBIE funding. “As major



Dr Anthony Poole, professor of bioinformatics at the University of Auckland.

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investors in science, governments must be able to show the value of science funding to the public,” the document begins. “Science is expected to make contributions to the attainment of explicit societal goals and advance development.”

The document’s author had a theme, and it could be summed up in a word: “The paper discusses the concept of impact as it relates to the science system. It sets out why impact is important, what impact is, what impact looks like, and how and where impact is generated. It also discusses the implications of the impact pillar for the science system.”

The word begins to throb in a reader’s brain like a maniacal drum.

“Policymakers use the word impact broadly to refer to effects on individuals, groups and society. This is different from the academic use of the word, which refers to the use of knowledge by other academics.”

Having a paper published by a top international journal is not the kind of impact MBIE is looking for. That kind of impact is a mere plop in a puddle. MBIE is looking for the kind that leaves a crater. “Another aspect to consider is the distribution of benefits to New Zealand versus the rest of the world. The New Zealand government is primarily interested in benefits that accrue to the New Zealand economy and society...”

A local crater, then.

“Government primarily invests in R&D and science because of the spillovers generated,” the paper goes on. “Comparing the different impacts of the science system and adding them together requires a common unit of analysis. The most pervasive common unit of value in current society is money.”

Is economic profit any basis on which to fund science? Discovering life on the moons

of Saturn would be incredible – a Neanderthal, frozen like a mammoth in Siberia, mind-boggling – but “spillover benefits” would be measured in awe, not dollars.

Aucklander Dr James Russell is a conservation biologist working for the University of Auckland’s School of Biological Sciences and Department of Statistics. He has won the most prestigious of New Zealand’s science awards, including a Rutherford Discovery Fellowship and the Prime Minister’s Emerging Scientist Prize. Rutherford Discovery Fellows are touted as the best and brightest of New Zealand’s mid-career scientists. Our Royal Society calls them “the science leaders of tomorrow”.

Russell won his awards for using DNA to find out how far rats can swim. One of the rats he studied broke the swimming distance record for rats, and, notoriously, took him over four months to catch. His research is at the forefront of New Zealand’s crusade to become pest free.

Russell was prepared to think positively of the MBIE paper. “I don’t think scientists should be entirely left to their own devices to decide what is important to research and what is not,” he told *North & South*. “Look at what happens to other industries – like real estate or finance – when they ‘self-regulate’. It’s good to have external checks to make sure society more broadly approves of what a sector is doing.”

But, he says, the paper seems to suggest “adding another level of reporting” to research. “This would do little to increase impact, especially if it is merely an accounting process to replace trust in scientists.”

Dr Anthony Poole is professor of bioinformatics at the University of Auckland, a Rutherford Fellow and president of the New Zealand Society for Biochemistry & Molecular Biology. MBIE’s document dismays him. “It looks to be pushing for a science system where impact is measured in terms of how quickly research gets turned into products in the market. There are massive problems with this view.”

Poole says scientific advances that lead to “technological transformations” tend to be made

without any idea of how, or even whether, the ideas could be applied. “Blue LEDs, for example, were at first considered a waste of time – but later led to a Nobel, and gave us modern screen technology.”

Poole points to the local work on nuclear magnetic resonance by Sir Paul Callaghan, which led to the formation of thriving company Magritek – a vaunted example of the commercialisation of government-funded research. “While this is a discussion document and MBIE is soliciting feedback, it seems the Government wants us scientists to do what Sir Paul did, in a fraction of the time, and without the basic research environment he enjoyed.”

Another Rutherford Discovery Fellow, Dr Geoff Willmott, is principal investigator at the MacDiarmid Institute for Advanced Materials and Nanotechnology in Auckland. “On one level, it’s a timely discussion,” he says. “Researchers do want to create impact, and we want to be part of a system that creates impact. [The paper has] some good ideas, particularly the need for increased assessment of grants at the conclusion of projects.”

But Willmott fears the burden of demonstrating putative impact will fall on researchers. “It is a task for which researchers are not well equipped – quite aside from it being a colossal waste of time. The definition of impact favoured in the document concerns economic and societal shifts that may be a long way downstream from the actual research.”

Willmott’s fears appear to be borne out by reports from those caught up in overseas assessment systems which are name-checked, approvingly, in the MBIE paper. One of them is the UK’s “Research Excellence Framework” (or REF), which operates at the level of subject areas within universities and determines government funding. British astrophysicist Martin Rees, Astronomer Royal and former president of the Royal Society, calls REF “a necessary evil”, although he says it “looms far too large; it creates perverse constraints and incentives. In so far as teaching is under-prioritised, the focus on the REF must take some of the blame.”

André Spicer, professor of

organisational behaviour at City University London, calls REF part of a “creeping government attempt to micro-manage the sector”. Putting an end to it, he says, would save £250 million.

There is no mention, in the MBIE paper, of measures to assess the “impact” on researchers’ productivity of yet another tidal wave of paperwork. New Zealand researchers are already saddled with exorbitant levels of form filling, reporting and grant seeking, some of which, rather scandalously, must be duplicated between university and MBIE. Despite the flash refurbished building and perky, media-savvy Twitter presence, MBIE hasn’t yet developed a “bot” to aggregate academic/MBIE reporting.

One researcher *North & South* spoke to complained of the “sheer waste” of New Zealand’s grant system. “A major grant is realistically a few weeks’ full-time work for the lead researcher, and others will contribute.” The researcher, who wished to remain nameless, told us: “You might expect to be leading one per year, contributing significantly to a couple more, and then bidding for several smaller grants that might take a few days or a week. The acceptance rate for a grant is around 10 per cent for many of the important government funds, so 90 per cent of this effort is going to waste.”

Is it so surprising that more assessment, especially if it is allergic to the fundamental research which drives science, might disturb those already plagued by red tape in our science system?

The University of Auckland’s Professor Shaun Hendy told the *New Zealand Herald* last year: “In the long run, our low funding success rates, the lack of post-doctoral fellowships, and the intensely over-managed science system that has evolved in the past few years will make it hard for our universities to retain star researchers.”

Is the MBIE “ocean liner”, in looking for “impact”, blundering us into a science “nanny state”?

“I get the sense this is, to some scientists, how the humanities felt when they came for them,” says Russell starkly. “And they replied, ‘But our work is valuable.’”

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