

A.R. Bellamy: People, places and things – reflections on a life in science

Willie Smith*

University of Auckland, Private Bag 92-019, Auckland

The massive restructuring of the national science system in 1989 led many scientists to crave a stability that would allow them simply to 'get on with the job'. The on-going debate on the place of science and research in national development, and the role of the CRIs and the universities suggests such stability remains some way off. Behind this debate is an implicit assumption that policies for science 'drive' the system. Professor Dick Bellamy, who retired at the end of 2008 after a long and distinguished career as a research scientist, senior manager, and champion of science, is well positioned to put such changes in perspective.

Back in 1953, Dick as a thirteen year old schoolboy in his first year at Auckland Grammar School, was yet to receive his first lesson in biology (Bellamy 2003). In 2008 he retired after 40 years at the University of Auckland. Preceding this, Dick spent three years (1962–65) as a Research Scientist at the Department of Scientific and Industrial Research (DSIR), completing his PhD while on staff, and then as a 'postdoc' worked from 1965–68 in the Department of Cell Biology at the Albert Einstein College of Medicine in New York. Over his career Dick moved from being a 'young radical' to take on a number of significant roles, including Senior Research Fellow in the Department of Cell Biology (1968–74), Associate Professor (1975–80), Professor of Cellular and Molecular Biology (1990–2008) Inaugural Director of the School of Biological Sciences (1991–2001), and Dean of Science (2001–2008).

Dick combined his research and other academic responsibilities with a number of other roles including that as a Director of New Zealand Forest Research Ltd, President of the Auckland Museum Council, elected Member for Eden in the Auckland Regional Council, and Member of the Establishment Unit of Transportation Auckland Corporation (and subsequent service on the Board of the Yellow Bus Company, the corporatised entity responsible for most of Auckland's bus services). Dick also played an active role within professional societies, becoming President of the New Zealand Microbiological Society (1975–76), and Chairman of the New Zealand Society for Biochemistry and Molecular Biology (1992–97). In 1983 he was elected as a Fellow of the Royal Society of New Zealand, and in 2005 was made a Companion of the New Zealand Order of Merit.

When Dick went to Auckland University College as an undergraduate in 1958, relatively few New Zealanders completed 7th form and perhaps only 15% went on to university studies. As he recalls, for those who did, the disciplinary pecking order was clear. Those who were clever in science took maths and physics and largely went on to enrol in engineering. Those weak in maths and physics went to biology. The clever in languages took law, and those somewhere in-between took medicine. Commerce

was still perceived as a 'night-school' subject, and law for the most part was part-time. Although the arts and humanities were well established, the social sciences were still in their infancy and largely represented by the Department of Geography (established in 1946). There were, of course, exceptions, but as Dick puts it, his marks in maths and physics were poor and so his obvious choice was to get into the natural sciences – biology. That may be so, but Dick's decision was also supported by a genuine curiosity and interest in the natural world and the environment, characteristics which shaped his career and continue to influence his life and activities today.

Graduates seeking employment as scientists also perceived a hierarchy. For the most part the brightest went overseas to undertake higher degrees, or were drawn to the DSIR because of its superior facilities. A few went to the universities, which at that time relied heavily on staff recruited from offshore (especially the UK) to take-up the slack.

As is the case today, the pressures on the science system to meet national economic needs were substantial. Consequently the bulk of funding and resources for research had traditionally gone to the Ministry of Agriculture (MAF) and the DSIR and was focused primarily on agriculture and other land-based activities. As problems were identified and solutions sought, field research stations had been developed and expanded around the country. This had encouraged the staffing of the DSIR with scientists committed to expanding understanding and applying their findings. Close relationships with 'user groups' were an inherent part of the job. The result was also a strong research culture and collegial approach, including efforts to peer-review potential submissions for publication, whether written by young scientists or more senior researchers. This stood in stark contrast to the universities, where teaching tended to dominate and research frequently came a poor second.

The research focus within the DSIR was further reflected in a clear hierarchy among the researchers. Each individual



Professor A.R. (Dick) Bellamy.

* Willie Smith may be contacted at w.smith@auckland.ac.nz

scientist's salary was public knowledge. DSIR managers emerged from the ranks of the scientists and were spliced on to the research system. Such managers generally saw their role as scientific administrators (now a somewhat neglected term), supporting and promoting their staff rather than as the bureaucrats many managers are perceived to be today. In a pre-computer age – certainly a pre-email age – this was aided by the fact that the Wellington HQ was for most some distance away. For the senior managers at the different research centres around New Zealand, it was a place visited only three or four times a year, when the budget was 'divided up', scientists' gradings were negotiated, and the like.

In the Plant Diseases and Fruit Research Divisions of DSIR at Mount Albert, Auckland, in the early 1960s, Dick felt the building pressure for further change. As he recalls, it was evident first in a pull away from basic science – exemplified for him in genetics – in favour of more narrowly focused applied work on 'whole plants', which sometimes overlooked the extent to which the value of such work hinged on a sound underpinning of basic research. By the late 1960s, feeling constrained, a number of top scientists began to move elsewhere, often to the universities. Among this group was George Petersen (then a biochemist in DSIR's Plant Chemistry Division in Palmerston North), who went to the University of Otago; Dick Matthews, who left DSIR for a chair in Microbiology at the University of Auckland; and Frank Newhook, who moved to become Professor of Plant Pathology at Auckland.

With the space race, which characterised the 'post-Sputnik era' (in the late 1950s), the political focus had shifted. An increasing proportion of funding had started going to the universities. University chairs were better paid than their equivalent positions in DSIR, and the University Grants Committee (formed in 1961) had started to provide substantial set-up funds to equip new buildings. Of course, the most ambitious or most politically

astute responded quickly and scored highly, pointed-up in the (possibly apocryphal) tale of the cell biologists at Auckland University accessing expensive gear while some other biologists requested only a chaise-longue for their office.

What didn't alter over this period was the availability of funding for PhD students. The practice had been for such students to go overseas, primarily to the UK. However, in the post-war era, national pride had increased and there was some general antipathy towards 'Poms', exceeded only by that reserved for those New Zealanders who did go to the UK and returned with airs and graces that exceeded those of their role models. The result was a shift in focus which, by the early 1960s, saw an increasing number of New Zealand PhD candidates drawn first to Australia, where generously funded teaching assistant positions were available and then subsequently to North America – to both Canada and the USA. Dick's own decision in 1965 to go as a postdoctoral fellow to a Medical School in New York raised eyebrows, but was part of this widening of national horizons in the post-war world. It was also perhaps some acknowledgement of the extent to which the USA, at least in some areas of science, had overtaken the UK and had used its much more abundant resources to gain a significant research edge.

The decline in the research vitality of the DSIR, the strengthening of the research culture in the universities, shifts in funding patterns, and some re-orientation of research linkages from the UK towards North America reflected longer-term trends. These were shaped in turn by individual personalities, national policies, and broader shifts in global society and political relations.

In 1968, when Bellamy returned to New Zealand, Auckland University was essentially a microcosm of the national scene, with the level of research across the disciplines being very uneven. In the post-war period, the Manhattan Project had given 'big physics' substantial clout. Chemistry had solid, well estab-



The practice at the end of WWII was for scientists to undertake postgraduate studies overseas, especially in the UK. These four senior scientists were together as young returned servicemen at Cambridge University in 1946: (from left) Dr Eric Godley, former Director, Botany Division, DSIR; Dr Ted Bollard, former Director, Plant Diseases Division, DSIR; Dr Alan Johns, former Director-General of Agriculture; Dr Dick Matthews, former Professor of Microbiology, University of Auckland.

lished industry links. Both physics and chemistry at Auckland University consequently developed a sizeable base of research funds and considerable influence as academic power brokers. Chemistry and physics also both had a strong income flow from their capture of the funding stream provided by first year engineering students. However, there were also far fewer science departments than today, and this also allowed key individuals to hold sway. In the right hands, enormous achievements were able to be secured. Universities in New Zealand were at the start of an expansion period, with the University Grants Committee investing in new buildings. The first of these inevitably housed chemistry and physics, but buildings for biology soon followed.

Dick Matthews, as Foundation Professor of Microbiology, is viewed by Bellamy as pivotal in the emergence of the current School of Biological Sciences. He also played an important role in the early stages of the founding of the new Medical School, which was a development opposed in some quarters. Matthews was at the cutting edge of the emerging discipline of molecular biology and had wide international linkages. Locally he was influential in setting scientific directions for the work funded by the then Medical Research Council and the New Zealand Cancer Society. The linkages he had built within the DSIR also were important in enabling him to influence the directions of biology, now in a university setting.

These contributions were grounded in his efforts and those of others to move biology from being a largely observational, natural science to become a much more quantitative, experimental discipline. This was backed by his own research experience in the UK and in the USA, and his strong personal international research links. In the process, Matthews transformed the status and role of microbiology and cell biology at Auckland, and provided the long-term support required that ultimately led to the integration of the biological sciences as a coherent area for research and study.

Dick Matthews also became part of an influential and able 'mafia' of scholars who came together at a time of critical change in the University. He and other former pupils of Mount Albert Grammar School, then one of New Zealand's top secondary schools, joined the staff of the University in the 1960s and played transformative roles. Others included Bruce Briggs in Anthropology, who championed research and teaching on Māori and Māori language, Jack Northey, who is credited with creating the modern Law School, and Keith Sinclair, who stamped his imprint on the Department of History and did much to shape New Zealand's self-image. As Bellamy recalls, these were heady days, because for the first time the direction of the University was being shaped by New Zealanders with a strong sense of New Zealand values and identity. Many had completed their training after the war and returned home with strong views on where the nation should be heading. Quite a few had seen service in the Western Desert and the Italian campaigns and were battle-hardened. As a group they did not find it easy to accommodate those with inflated egos or academic pretensions.

New Zealand's universities were also at that time increasingly impacted by wider global trends. At Auckland the response was spearheaded by Colin Maiden. Appointed Vice-Chancellor in 1971 from his then position as a senior manager at General Motors, Maiden was the youngest ever appointed to such a

position in the Commonwealth. Under his guidance, and supported by many of the academic power brokers noted above, university procedures were tightened. Maiden championed change, exemplified in his broadening of Senate membership beyond professors, to include students and non-university appointees. The ripples from the Berkeley riots and fear of their replication closer to home helped the process. The move away from the concept of sole professors as Heads of Departments followed soon after.

The University Grants Committee had ensured a rational distribution of resources and avoided the proliferation of core capacity, including setting limits on the duplication of core programmes in medicine, engineering, veterinary science, and the like. Its disestablishment in 1990 generated increased competition between universities at the very time they were consciously building and expanding their own graduate programmes. In the short term, the result of this was perhaps to revive the universities' provincialism, but in the longer run it encouraged them to strengthen their international links. Paradoxically the DSIR was at the same time heading in the opposite direction. By the mid 1970s its basic science role had withered and almost collapsed. There had been an expansion of its head office from a small core facility to a more dominant and intrusive presence. Continuing competition between DSIR and the Ministry of Agriculture had from time to time promoted the idea of reorganisation, and in the late 1980s, under the crafting of Simon Upton, Ray Meyer, Andy West and others, the CRI model emerged.

Throughout the '70s and '80s, Dick notes that the drive for 'relevance' and demand for research to promote economic growth and development remained a consistent theme. Today it has found new political expression. At that time, government research, including the DSIR, continued to address the economic and development needs for which it was designed. The universities, too, while increasingly striving to meet international benchmarks, fed into the national innovation system and trained employees to meet national economic and social objectives. All this was directly reflected in the type of staff appointed, whether to MAF, the DSIR, or to the universities. Awareness of 'clients' needs' was an established component of scientists' work. Equally New Zealand's size, isolation and cultural heritage had long encouraged its scientists to build and maintain powerful international connections. Going overseas for PhD studies and post-doctoral opportunities and the inflow of scientists from overseas to work in New Zealand is a long-standing tradition, and too often poorly recognised and undervalued. Such interchanges promoted the exchange of ideas, bolstered confidence and cemented long-term friendships and research links. Inevitably such interchanges were not limited to research activities within the bounds of formal institutional structures. Scientists, whether working in DSIR or within the universities, listened, watched, learned and responded to changing social needs.

These and other traits came together and found expression in the contribution research scientists in the universities made to the broader community. Such contributions were often, too, extensions of experience gained by scientists who had left New Zealand for graduate work overseas. As a biologist and in the context of his times, for Dick Bellamy this found expression in the environmental movement. New Zealand had been transformed by European settlement, the clearance of the

forests, and the promotion of agriculture, but almost entirely lacked heavy industry and the pollution associated with such activities. Driving down the New Jersey turnpike from New York in the 1960s had opened Dick's eyes to the impact on the environment of much modern development, in much the same way that the impact of the Industrial Revolution had impacted on the environment of his forebears in England. As he puts it, 'They left England; I decided to return to New Zealand!'

Before he had left New Zealand there already had been a few major conservation battles that influenced his outlook. The raising of Lake Manapouri was the most important, but upon his return in 1968 he found the conservation movement pretty disorganised. After some initial involvement with the New Zealand Conservation Society (now defunct) and the Federated Mountain Clubs of New Zealand, Dick became associated with the Environmental Defence Society (EDS). This group had been founded by David Williams (now David Williams QC) and was modelled on the US Environmental Defence Fund – the concept was to combine lawyers and scientists to present evidence in defence of the environment. It remains a powerful combination.

Dick together with a number of other University staff soon became involved in EDS activities in a major way. There were some significant cases. Dick was first attracted by their initial case, which involved the prosecution of the Huntly Borough Council for the illegal discharge of sewage into the Waikato River. On reflection, Dick acknowledges that he probably spent more time than he should have done on these activities, and he pays tribute to the University 'that they were prepared to tolerate such an extensive involvement by me in many high-profile cases'. Those were the days of the Town and Country Planning Act (1957) and the Water and Soil Conservation Act (1968). It was a relatively easy task to mount credible presentations – with legal help – because environmental case law was in its infancy and the development agencies such as the Electricity Department and the Ministry of Works were inexperienced in litigation. They had not yet come to terms with the change in public attitude from 'all development is good' to one that was increasingly critical of the impacts created by major projects. Involvement with EDS introduced Dick to a wide circle of contacts outside the University, and his subsequent involvement in local government arose from this recreational interest. A period spent on the Board of the Tongariro National Park at least in part stemmed from involvement in these and other conservation issues.

Looking back over the past 50 years, Dick believes that a few major trends stand out as having impacted upon his own career in science and administration and on the development of New Zealand science in general.

First, in his own research field, the revolution introduced by molecular biology and molecular genetics changed the balance of research internationally in a major way. Molecular biology commenced in the 1950s when a small group of physicists at Caltech became interested in evolution and genetics and were smart enough to see that phage and bacteria formed the model system to sort out the fundamentals.

Although the success of molecular biology initially impacted adversely on the chemical and physical sciences, he sees

much recent evidence that this trend is reversing as it becomes increasingly evident that these core scientific disciplines – and engineering – hold the key to further advances in the biological and biomedical sciences.

Second, Dick believes that the inter-university competition introduced by the dissolution of the University of New Zealand and establishment of independent universities has perhaps not been entirely a good thing for the nation overall. New Zealand remains a small isolated country with limited capacity to invest. A University of California model (i.e. retention of the University of New Zealand model) might have been more beneficial for New Zealand overall and prevented some of the unnecessary duplication in resources that has occurred in recent years. Today's eight independent universities are far too many and some of these constantly struggle to remain either academically or financially viable. In the long-run Dick sees some rationalisation as inevitable.

Third, Dick thinks that the continued spread of science across separate university and CRI sectors is wasteful and rather silly for a nation of our size. There are too many CRIs and, like the small universities, several also struggle to remain viable. Recent successful (and unsuccessful) merger proposals reflect this reality. The American model of major government-funded facilities more closely associated with universities would perhaps be more sensible, enabling better utilisation of staff and providing much better opportunities for graduate training. This is the model currently applying to the Jet Propulsion Laboratory (administered by Caltech on behalf of NASA) and the Lawrence Livermore National Laboratory (administered by a consortium that includes University of California at Berkeley) and Dick believes it is one that would better suit New Zealand. There are, as Dick sees it, a number of other ways that universities and CRIs could be brought closer together, but this would require more vision and political courage than he has seen exhibited by governments over the past 20 years.

Dick, however, remains optimistic. Notwithstanding organisational and funding difficulties, New Zealand science has managed somehow to remain internationally competitive. Funded about 40% below the Australian average, the quality of New Zealand's scientific publications remains just as high and the taxpayer gets value for money. 'Over recent years, cheaper air transport and electronic connections have revolutionised our ability to communicate with the rest of the world. If we can be smart about how we manage our energy and water resources over the next decade and if we can diversify our exports further, we should be in good economic shape in future. All this requires the better use of science and technology as the underpinning engine to achieve our economic goals. This will remain an enduring challenge for the current government and any in the future. As in the past it will also require the fostering of individual scientists whose efforts today, as before, ultimately drive the science system'.

Reference

Bellamy, A.R. 2003. The view from the north: the early days of molecular biology in Auckland, *New Zealand Science Review* 60(1): 15–23.