‘Connecting the Periphery: A History of Computing in New Zealand, 1950 – 2000’

[SLIDE 1: Google Earth]

As a small country, with a population that is still under 5 million, New Zealand needs to deploy its intellectual resources carefully. This has resulted in a historiography dominated by work from social historians and, more recently, postcolonialists. The harsh fact of European colonisation, which started in 1840 and devastated Maori culture and society through illegal land grabs, disease, and racist government policies, has been an obvious and necessary focus of the last fifty years. Our historiographical legacy isn’t without its problems, though. The focus on social and cultural interpretations of our past has led to a view of the settlement process that is heavily oriented towards political, intellectual, legal, and literary features: we know little about the impact of technology on the country.

James Watson and Ruth Barton have spent their careers building the history of science and technology in New Zealand, so all is not lost for the sub-discipline as a whole, but the history of computing is almost entirely invisible. This is unfortunate, because the country can contribute a lot to the global discourse on computing. I can only assume such work would be welcome, because our understanding of the development and diffusion of computing technologies outside Europe and North America seems limited.

New Zealand would provide a useful addition, which I suggest should extend back to a nineteenth century ‘prehistory’. The fact is that colonisation – whether in the antipodes or elsewhere – requires computation. At the very least sheep needed to be counted and weighed, but so did people, products, and finances. James Belich notes

that the country's isolation in the South Pacific led to the "quick uptake of new technologies", a comment borne out in everything from early adoption of the telegraph to the development of refrigerated meat transport.

[SLIDE 2: Lightening Insurance Computer]

In computing this translated into a robust employment market for human computers as far back as the 1860s, and the appearance of machines like the 'Lightening Insurance Computer', advertised for sale in the *Evening Post* newspaper in 1891. The Lightening was marketed as

> A mechanical [sic] Apparatus, for which the ordinary calculations required for [sic] Insurance purposes can be made almost instantaneously without mental effort or the use of pencil and paper.

Like much New Zealand technology of the time this was a locally designed and manufactured device; isolation made imports prohibitively expensive, and the local culture prided itself on ingenuity and self-sufficiency. The machine was invented by Mr. J. B Poynter, and patented in England and the other British colonies. Users described it as being remarkably accurate, to the point where it was reportedly being considered for use during the New South Wales census of 1891. By the turn of the century New Zealand scientists and engineers were building "complicated electrical devices" like the "respirator-calorimeter", which cost £3000 and measured the input and (gaseous) output of cattle.

[SLIDE 3: COMRIE, MONIAC ETC]

Competition against manufacturers in Australia, the United Kingdom, and the United States would always have made the development of a local computing industry difficult but it remained a possibility until World War Two. Of more

significance internationally was the contribution of computer pioneer L. J. Comrie, who took his undergraduate degree at the University of Auckland and is recognised as the first person to put punched-card technology to use for scientific calculation and, after being dismissed from the UK's Nautical Almanac Office, to establish a commercial computing service for scientific applications. Comrie is an integral figure in the story of early machines like the ENIAC, BINAC and EDVAC. He was an early advocate of multi-purpose computers, in an era when prominent figures like Walter Ekert were extolling the benefits of bespoke machines.

Despite his importance, the MONIAC (Monetary National Income Analogue Computer) is of more relevance to New Zealand's computing history than Comrie, however. New Zealander Bill Phillips designed this analogue machine in 1950, to model the United Kingdom's national economy (it was the first application of computing for that purpose). The MONIAC used fluidic logic to visualise the effects of changes in macroeconomic parameters like consumption, savings, investment, and government expenditure. Fourteen machines were eventually built, one of which has been restored to working order and sits in the foyer of the Reserve Bank of New Zealand. Although out of step with analogue computers being developed overseas at the same time, the MONIAC illustrates the local industry well: slightly out of step, but innovative and effective.

The development of transistors and integrated circuits, and the appearance of mass-produced digital computers in the 1960s, fundamentally changed the trajectory of computing in New Zealand in a way that is likely to have been mirrored elsewhere in the world. Local production, always of questionable cost-benefit, ceased altogether (except for an attempt to build and market a micro computer called the Proteus in 1985). This period saw the appearance of a range of machines from Australia, the

United Kingdom, and the United States. It is a well-understood era amongst computing historians, but its effect in countries like New Zealand is relatively unknown.

[SLIDE 4: Muldoon etc]

The American boom in computer manufacturing during the 1960s not only ended the possibility of a local computing industry, but also illustrates the entanglement of our computing history with economic issues. By the 1950s New Zealand's geographic isolation from Britain, and Britain's increasing orientation towards the European Economic Community (which they formally entered in 1973), was becoming strained. Although successive New Zealand governments energetically tried to ensure UK markets remained open, it became obvious they would need to diversify from a solely agricultural economy and develop export markets outside Britain and Australia. The process was by no means easy, and for two decades the country played a balancing act between old and new markets.

A similar thing happened with computing imports. Early purchase orders appear to have been finely balanced between British brands like International Computers Limited (ICL), and American ones like DEC, VAX and IBM. New Zealand's first modern digital computer was an IBM 650, used at the Department for Scientific and Industrial Research (DSIR) during the 1950s, for general scientific use and economic modelling. It followed a variety of plug board calculators and was shared across government departments and the research community. The country's population only hit 2 million during the 1950s, so computing resources were always going to be scarce. People working in the community at the time recall smart graduates leaving the country for the US in the 1960s, in an effort to take advantage of work opportunities there.

An IBM 1620 was installed at the University of Canterbury in 1963, to support courses in Business Data Processing and Scientific Computing. This required an application to the government in Wellington, which demanded sign-off on every machine imported into the country. It was the first solid-state machine installed in the country, and the first to be purchased for primarily research and teaching purposes. It ran until 1973 when a Burroughs B6078 with 16K core storage and two VT05 display terminals replaced it. By 1974 staff working in the university computer centre were reporting intense workloads and a lack of properly trained staff to operate the card-punching machine. Like most universities in the country, by the 1970s a variety of microcomputers like the PDP-11 and DEC began to be chosen ahead of mainframes. The Bank of New Zealand purchased the country's first commercial computer in 1966. This IBM 360-30 was used to provide services under the 'Databank' brand to a consortium of banks operating in the country and, like the DSIR's IBM 650, was made available to secondary school students involved in early computer science courses.

State-led purchases remained important until well into the 1980s, however. This was fuelled by major industrialisation projects delivered under the Muldoon government's 'Think Big' initiative, which aimed to offset Britain's entrance into the EEC by engaging in a massive public works programme focused on developing energy self-sufficiency. Several major gas and hydroelectric projects were initiated in the 1970s, and required significant compute power. This led to the state controlled implementation of four national mainframes, all located in Wellington, New Zealand's capital city. They consisted of an IBM 360 used for the Health sector, another IBM machine used for scientific research and payroll, a Sperry-Rand

UNIVAC 1110 used for law enforcement, and an ICL2890 that was plagued by problems and used for general computing services.

The machines were run by a central Government Computing Service, which developed into the current Government Communications Security Bureau (GCSB), the New Zealand equivalent of the United Kingdom's GCHQ and American NSA. Robert Muldoon, an autocratic Prime Minister who clung to power for close to a decade, established the GCSB in 1977. The history of this secretive agency needs to be documented, to understand its role in defining New Zealand's contribution to global signals intelligence work. All we know at the moment is that its culture developed at a time of very tight state control.

Our integration into the developing global Internet occurred in late 1983, with a dial-up connection to Melbourne that routed into ARPANET via Calgary. By the late 1980s academics and IT professionals were advocating for a wider roll out, but this only came in the 1980s after the US government encouraged New Zealand to enhance connection to the Internet to assist them in their communications to Antarctica. The lack of interest at government level seems odd given how isolated New Zealand has always been, but reflected a state controlled economy that was resistant to innovation.

[SLIDE 5: Spacies arcade etc]

This wasn't the case in the private sector, though, leading to strong development of personal computing from the 1970s. This developed in much the same way as other countries, driven from the electronics hobbyist community, but (mirroring government mainframe purchases) included an interesting split between British and American models. BBC Micros, Spectrums and Amstrads were common,

and were only crowded out by American brands with the appearance of Apple and Commodore in the late 1980s.

Unlike many countries, the choice of personal computer in 1980s New Zealand could be a politically loaded one, and was connected to a broader cultural conversation about the growing dominance of American culture and the 'abandonment' of New Zealand by Britain after their entrance to the EEC. This aspect of our computing history is connected to a history of moral panics about American culture that began in the 1950s, when a government report claimed that American comics were leading New Zealand youth down a dangerously permissive path. By the 1980s this tendency towards moral repression – referred to as 'New Zealand Puritanism' – found expression in a series of panics associated with computer games, both in their arcade form and later when they moved into teenagers' bedrooms.

I've presented a broad but extremely thin narrative of computing in New Zealand here, but this is of necessity as much as design. Any general history of computing in New Zealand will require considerable primary research and interviewing to flesh out the gaps in the historical record. It may well be that a better tactic would be to start at a more detailed level, ignoring the larger narrative in favour of targeted and more technically-oriented topics, but my feeling is that we need a broad general history to enable university teaching and foster post-graduate research. While subsequent work could well point to gaps and failures of interpretation in that first general history, researchers would at least have something to aim at.

- Questions as well as ideas about how I should go about a project like this are most welcome.