ENNZ: Environment and Nature in New Zealand

Paul Star, ' "Nature's Trump Card": Confronting the Rabbit Problem in Southern New Zealand, 1867-1897'.

Australian scholar Stephen Dovers claims that "the point of environmental history ... [is] to examine the past as it relates to environmental and resource issues in the present".1 While I do not think historical research has to be justified by reference to its worth for present society, nevertheless, knowledge of environmental history can provide insights not only for historians who interpret the past but also for those of our contemporaries who seek to affect the future.

Take the current "rabbit problem".2 New Zealanders have heard a lot about rabbit calcivirus disease (RCD), which, as with myxomatosis in the 1950s, was expected by some to knock back rabbits in sufficient numbers, and sufficiently permanently, to solve the problem they present to sheep farmers in many parts of the South Island. Conscious of the uncertainty both of its effectiveness and of its wider consequences, government decided not to introduce RCD – but farmers, more conscious of the size of their overdrafts and the failure of other methods, introduced it regardless. Although I do not here address this recent development or, indeed, the rabbit problem over the last hundred years, I show that, by learning something of the problem in the nineteenth century, we gain useful insights into ensuing events.

The rabbit story in the late nineteenth century demonstrates tensions within New Zealand society, notably between Otago runholders and small farmers. The conflict between different sectors of New Zealand settler society is, however, a narrow theme compared to the wider conflict between settler society as a whole and the New Zealand environment. It is in this light that a local historian, Irvine Roxburgh, described the rabbit as "nature's trump card".3

The problem arose consequent with colonists' ignorance of the complexities both of the ecosystems which preceded them in New Zealand and of the British "agroecosystem" with which they sought to replace it. An "agroecosystem" is "an ecosystem organized for agricultural purposes – a domesticated ecosystem ... a rearrangement, not a repeal, of natural processes".4 This is precisely what colonists in New Zealand in the late nineteenth century, faced with rabbits,

1 Stephen Dovers (ed.), *Australian Environmental History: Essays and Cases*, Melbourne, 1994, p.6.
2 The problem is considered in its New Zealand context, but the course of events in Australia - including the introduction of RCD - has been similar. After 1997, RCD was increasingly referred to as rabbit haemorrhagic disease (RHD).
3 Irvine Roxburgh, *Wanaka Story: A History of the Wanaka, Hawea, Tarras, and Surrounding Districts*, Dunedin, 1957, p. 131.
4 Donald Worster, "Transformations of the Earth: Towards an Agroecological Perspective in History", *Journal of American History*, Vol 76. No. 4 (March 1990), pp. 1093-1094.

discovered. Initially a gradual transforming process took place on the colony's land surface. The “natural” ecosystem known as “the bush”, plus the Mäori-modified native grassland ecosystem, were increasingly replaced by pasture of introduced grasses for sheep. By 1870, two processes were taking place. As the more natural ecosystems continued to retreat before a sheep-dominated agroecosystem, a maverick rabbit-dominated ecosystem intruded upon both.

Many early introductions of the rabbit (*Orcytolagus cuniculus*) were conducted with pride, and in the early 1860s, there was general satisfaction at their success. The rabbit “problem” (as it became) began in Kaikoura and in Southland in the late 1860s. In 1876, a “Report on the Rabbit Nuisance” explained that “gradually, and at first scarcely perceptibly, the rabbits moved from place to place until, during the past two years, there appears to have been a vast impulse given to their migration, when at length their presence has become a subject of bitter regret, and the cause of much and increasing anxiety”.5 The rabbits' “extraordinary fecundity” - often seven litters in a year - ensured their rapid spread.

The report spelt out the “evils attending their occupation”. The trouble was, basically, that the rabbit ate the same food as sheep, but while mutton was widely consumed, few wanted to eat rabbit meat and while everyone wanted wool, rabbit skins were of little value and in limited demand. The rabbit, it was explained, “chooses the English and finest native grasses, yet condescends to snatch a meal off the young tussock grass growth as it springs into existence. Not only does it devour, but it destroys herbage by its pollutions wherever it feeds, driving cattle and sheep away, and rendering the soil a desert.”6 Rabbits decreased the sheep-carrying capacity of the land, while the remaining sheep fattened less well, and produced wool of lesser quantity and quality. This posed a particularly acute problem, since the rabbit infestation struck at a time when the sheep industry accounted for half the total value of New Zealand's exports.

No-one really knew how to deal with this uncontrolled Frankenstein's monster. Earlier ecological problems had been manageable. Scab in sheep had been eradicated; the spread of thistles could be accommodated; but rabbits were different.

In seeking a solution, two approaches were adopted in tandem. Some looked to legislation, but many parliamentarians opposed compulsion. The 1876 Rabbit Nuisance Act did not enforce its findings but only established machinery which *might* be set up by districts, thereby producing only local-level responses. Its limitations became clear as the infestation continued to spread northwards through Otago towards Canterbury. People therefore sought, secondly, effective practical action. The possibilities were debated continually and obsessively. One

5 Sir J. L. C. Richardson and W. H. Pearson, “Report on the Rabbit Nuisance in Southland”, *Appendices to the Journal of the House of Representatives* (AJHR), 1876, H-10, p. 3.
6 Ibid., p. 4.

wit observed that "if the rabbits could only be made to read all the letters that have appeared about them in the daily Press, I am sure they would die on the spot".7

Mechanical solutions emerged first. In 1876, in Southland, this involved "hunting them down with dogs on the plains" and "shooting and hunting them on the edge of the bushes, and in broken ground". Traps thereafter became standard equipment for rabbiters in New Zealand as they had in Australia. But still these also did not reduce numbers sufficiently.8 Around 1879 the situation had become so desperate that most landholders used poison. Poisoned oats laced with phosphorus became ubiquitous in the fight against rabbits. Its implementation was not undertaken without thought to side-effects, but financial considerations won the day over the protests of acclimatisation societies worried about losing pheasants. In 1881, a runholder said "the objections of the cure are of course obvious". He acknowledged that "all imported and native game will suffer severely" but "the rabbit *must* ... be put down, or else the greater part of the South island will be made useless".9 Another runholder, reinforcing these findings, said he "was very fond of birds; but if it came to a question whether he would have birds or sheep, he would certainly vote in favour of the sheep".10 While other species might be affected, most were prepared to take the gamble.

There were also "natural solutions", of varying subtlety, which encouraged nature to do the work of destroying rabbits. For a start, existing native predators, especially hawks and weka, could be encouraged.11 A few colonists admitted their use, but it was hard to imagine native birds playing a major part in rabbit control while at the same time believing, as many did, that because they were indigenous species they were inferior and declining.12 This implied that their value could only be, at best, auxiliary, and that any real solution must lie elsewhere.

Other vermin could be *introduced* to kill the rabbits. In 1879, someone proposed bringing in the Australian "tiger-cat" to solve the rabbit problem. This is the Spotted-tailed Quoll (*Dasyurus maculatus*), a carnivorous marsupial not unlike the Tasmanian Devil, which kills birds and rats by biting the back of the

7 *Otago Witness*, 28 Oct. 1876 p. 13.
8 Eric C. Rolls, *They All Ran Wild: The Story of Pests on the Land in Australia*, Sydney, 1969, pp. 79-86.
9 Anon., "Rabbits in New Zealand, by a Runholder", *Chambers's Journal of Popular Literature, Science and Arts*, Edinburgh, 25 Jun. 1881, pp. 409-411.
10 Capt. Fraser in *New Zealand Parliamentary Debates* (NZPD), 1876, 23, p. 613.
11 B. P. Bayly, "Annual Report on the Rabbit Nuisance", AJHR, 1883, H-18, p. 4; T. H. Potts, Out in the Open: A Budget of Scarps of Natural History, Christchurch, 1882, p. 294. Species referred to are the native harrier (Circus appoximans), falcon (Falco novaseelandiae) and woodhen (Gallirallus australis).
12 "Displacement theory", popular in the nineteenth century, considered that native species had evolved less than northern or European species, so were bound to be displaced in the battle for survival of the fittest once northern species were introduced.

neck. Action to prevent such an introduction was prompt.13 The quoll might have been a cheap option, but it was an unknown colonial, perhaps therefore inferior, and certainly not a "natural" enemy of the rabbit, like the weasel. Mustelids – that is, weasels (*Mustela nivalis*), stoats (*Mustela erminea*) and ferrets (*Mustela furo*) – have habits similar to the quoll, but they could only be obtained at great cost from the other side of the world. They were difficult to transport and perhaps not hardy enough to survive the harsh winters of parts of South Island. But, in their favour, they were British.

Colonists had long considered the introduction of mustelids to control rabbits, but Government pursued the option only once men with guns, voluntary legislation, poison, and compulsory legislation, had each in turn proved ineffective. The eventual introduction of mustelids represented the victory of income over the environment, of landholders' desperation over scientific foreboding.

Professor Alfred Newton of Cambridge had spearheaded a campaign in 1876 to ban mustelids in New Zealand, because of their likely effect on bird life.14 However, all his warnings were swept aside with the new Rabbit Nuisance Act of 1881.15 Thereafter, mustelids were a protected species, with a £10 fine for killing them. They became the "fourth column" in the "rabbit wars". Benjamin Bayly, the Inspector of Rabbits, masterminded campaigns in the 1880s, with a crusading zeal unmatched until Major Yerex organised the "deer wars" in the 1930s.16

Rather ironically, Bayly released stoats and weasels just when he felt (quite wrongly) that his poisoning programmes had more or less beaten the rabbit problem. His fears had begun to centre not so much on the infested areas but rather on their margins, and in particular on the "waste lands" – meaning the native forest or "bush". In fact, rabbits only ever occupy the *edges* of the bush, or clearances in it, and dense bush impedes their spread. But for Bayly in 1884, "the huge areas of unoccupied waste lands fringing the West Coast, mostly unknown and inaccessible, will be a standing menace to the occupied country adjoining them, especially that near the provincial boundary of Canterbury."17

Where possible, the settlement of land in advance of the rabbit received every encouragement. An 1884 Parliamentary Committee called for "immediate steps to provide for the occupation of unoccupied Crown lands and reserves ... which afford breeding grounds for the pest". However, this did not seem a quick enough solution beyond the Lakes and towards the West Coast, where the bush

13 Otago Acclimatisation Society minutes, 15 Aug. 1879 (Hocken Library, Dunedin).
14 NZPD, 1876, 23, p. 612.
15 NZPD, 1882, 41, p. 597.
16 See Chapter Two, "Fighting the Deer Menace: The Deer Destruction Campaign, 1930-1934", in Ross Galbreath, *Working for Wildlife: A History of the New Zealand Wildlife Service*, Bridget Williams Books and Historical Branch, Department of Internal Affairs, Wellington, 1993.
17 Bayly, "Annual Report on the Rabbit Nuisance", AJHR, 1884, H-2, p. 2.

remained dominant. So when the first Government shipment of weasels and stoats arrived later that year, Bayly had the weasels "released on a peninsula of about 8,000 acres, on Wanaka Lake"; the stoats he had "turned out on the east side of Hawea Lake".18

By 1886, Bayly could claim complete success with the weasels in the former location, where "an area of badly-infested country ... has been permanently cleared at an expense of about £5000". However, he noted that "in other localities where these animals have been liberated the same conditions do not exist." The "natural enemy" was "rapidly gaining ground, and is favourably reported upon; but they require to be turned out in large numbers and the ground worked systematically before they become effective: even then the transitional stage must necessarily take a long time prior to a balance being attained." The answer, for Bayly, seemed to be more mustelids.19

Others disagreed. The Otago Institute heard that, "by some unaccountable blunder, some of the ferrets so rashly introduced to keep down the rabbits have been liberated on the western side of Lake Manapouri, where there are no rabbits, but large numbers of flightless birds ... and unless vigorous measures are taken to counteract this foolish - nay, criminal act, the most interesting members of our unique avifauna will be doomed to speedy extinction".20 You did not have to be a scientist to see such devastation. In 1887 a sixteen-year old walked twenty miles up the Hollyford Valley and counted "twenty dead kakapo all freshly killed by weasels".21

But the releases continued. During the 1888-89 season, for instance, a thousand stoats and weasels were liberated by the Awatere Rabbit Board in the Marlborough area. Nevertheless, overall, the situation grew grimmer. Rabbits returned in force to the infested areas of Otago and moved from there into South Canterbury, while another population spread from Kaikoura through the Amuri District into North Canterbury. Ten million rabbit skins exported in a typical year represented only a fraction of those killed, and the dead numbered far fewer than the living. Bayly acknowledged that "we have not yet arrived at the solution of the difficulty", and talk began to turn to the use of disease to wipe out rabbits, if a suitable one could be found.22

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18 B. P. Bayly, "Annual Report on the Rabbit Nuisance", AJHR, 1885, H-16, p. 1; Johnson , "Report of the Joint Committee of Sheep and Rabbit Acts", AJHR, 1884, I-5, p. 150.

19 B. P. Bayly, "Annual Report on the Rabbit Nuisance, AJHR, 1886, H-19, pp. 1, 2; G. Randall Johnson (Chairman), "Report of the Joint Committee on Rabbit and Sheep Acts", AJHR, 1886, I-5, pp. 70-71.

20 Otago Witness, 26 Nov. 1886, p. 13; Transactions of the New Zealand Institute (TNZI), Vol. 19 (1886), p. 613.

21 John Hall-Jones, *Martins Bay*, Invercargill, 1987, p. 150. The kakapo (Strigops habroptilus), a flightless ground parrot endemic to New Zealand, is now a severely endangered species.

22 Johnson (Chairman), "Report of the Joint Committee on Rabbit and Sheep Acts", AJHR, 1886, I-5, p. 13.

Not syphilis. It had already been experimented with in Australia to kill rabbits, but this was stopped because it ruined the market for rabbit meat.23 In 1883, the *Otago Witness* still considered the use of any disease "fraught with danger to other animals, and even to human beings, and ... certainly a repulsive method, which we should adopt with *reluctance*". But, as another journalist put it, "as a desperate remedy we require a desperate disease".24

The first Professor of Biology at Auckland University College was superbly qualified to investigate this kind of solution. Before coming to New Zealand, A. P. Thomas had been commissioned by the Royal Agricultural Society of Britain to investigate the life cycle of the parasitic fluke which caused liver rot in sheep.25 He was now commissioned by the New Zealand Government, in 1888, to investigate the bladder fluke and other disease in rabbits.

Thomas did not find a satisfactory disease, but the publication of his reports introduced many colonists to a scientific approach.26 Tremendous interest had already developed in the relationship between microscopic organisms and disease.27 Louis Pasteur's researches in France received wide coverage in the New Zealand press during the 1880s. Conversely, Pasteur closely followed events in Australia and New Zealand, where everyone began searching for a disease to control rabbits once the New South Wales Government offered £25,000 – a fortune at this time – to whoever could find one.

Pasteur thought he could solve the rabbit problem with chicken cholera. He had already experimented with the disease in Europe, where the closely allied Asiatic cholera was a major cause of human death. His nephew arrived up in Sydney in 1888, at the invitation of the New South Wales government and duly set up a laboratory on Rodd Island, in a remote part of Sydney Harbour across the way from Callan Park Lunatic Asylum, and here began work on chicken cholera for rabbits.28 This experiment might have taken place in New Zealand. In 1888, a Marlborough settler urged the Government to import cholera from France, and offered his own run as the perfect place for a trial, or suggested Quail Island in Lyttelton Harbour.29

Many Australians, fearful for both the health of themselves and their stock, were very uneasy about what was going on at Rodd Island, so French proposals for

23 Hodgkinson (Chairman), "Report of the Rabbit Nuisance Committee", AJHR, 1876, I-5, p. 18.
24 Otago Witness , 25 Aug. 1883, p. 13; 8 Sep. 1883, p. 14; 6 Oct. 1883, p. 6.
25 M. J .O'Sullivan, *Algernon Phillips Withiel Thomas, 1856-1937: Educationalist, Scientist, Horticulturist*, Auckland, 1968[?], p.10.
26 A. P. W. Thomas, "The Rabbit Nuisance: Interim Report on the Diseases affecting Rabbits in the Wairarapa District", AJHR, 1888, H-18, pp. 5-6, 7; A. P. W. Thomas, "Report on the Parasitic Diseases affecting Rabbits in the Wairarapa District", AJHR, 1889, H-4, pp. 1, 11.
27 TNZI Vol. 21 (1888), pp. 515, 529; Vol. 22 (1889), pp. 31, 55-63.
28 Rolls, *They All Ran Wild*, pp. 150-160, 162.
29 L. W. McCaskill, *Molesworth*, Wellington, 3rd edn., 1975, pp. 149-151.

large scale experiments on mainland Australia were blocked. Nevertheless, in 1895, a Queensland bacteriologist used the disease, with some success, and at much the same time New Zealand's Chief Veterinary Officer trialled chicken cholera at Clydevale Station in Otago. He found it had some use as a poison (though rather less so than phosphorus), but as a disease it failed to spread effectively. His report appeared in 1897, at which point experiments with this particular disease were abandoned.30

A further practical solution, rabbit-proof fences, had surfaced by then, and for a while they seemed like the way forward, more effective than guns and traps, poisoned grain or mustelids, bladder fluke or chicken cholera. But in 1897 rabbits continued to plague New Zealand's farmers. This is still the case.

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In 1993, the American historian, William Cronon, compiled a list of what he called "the core lessons that make environmental history useful".31 We can use these to identify the rabbit story as the stuff of environmental history, and, through Cronon's words, to point out what lessons may be learnt from it.

Cronon's first contention is that "all human history has a natural context". The rabbit problem is certainly a powerful example of human activity, which through the introduction and distribution of rabbits, impacting not only on both agroecosystems and the supposedly natural native ecosystem, but also upon the human social system, as it increased pressure to break up the great estates and reduce squatter influence in New Zealand. John McKenzie, who as Minister of Lands facilitated closer settlement in the 1890s, subscribed to the view that "small holders can manage to keep the pest within reasonable bounds, while the large holders cannot".32

Cronon's second finding, in line with current ecological thinking, is that "neither nature nor culture is static". Environmental history demonstrates that "the relationship between nature and culture should always be viewed as a problem of comparative dynamics, not statics", in which "the rate and scale of such change can vary enormously". In this light, we may regard New Zealand as a slowly-changing environment which experienced rapid change with the arrival of Mäori, transformation that only accelerated with European settlement. The spread of rabbits is a striking instance of the swift and extensive alteration of an already much-modified and simplified ecosystem.

30 C. J. Pound, "Rabbits and the Chicken Cholera", in *Otago Agricultural and Pastoral Society Annual Journal* (1897), pp. 100-102; J.A. Gilruth, *Chicken Cholera*, Wellington 1896-1897; Rolls, *They All Ran Wild* , pp. 170-191.
31 William Cronon, "The Uses of Environmental History", *Environmental History Review*, Vol. 17 (1993), pp. 12-18.
32 Otago Witness 8 Jul. 1876 p 19; McKenzie's view in Johnson (Chairman), "Report of the Joint Committee on the Rabbit and Sheep Acts", AJHR, 1886, I-5, p. 66.

Cronon's third finding is that "all environmental knowledge is culturally and historically contingent". Clearly, the introduction both of rabbits and mustelids to New Zealand went along with a widespread belief that indigenous species were inferior to European ones, and gained support from the theory of their inevitable "displacement". A gradual rejection by settlers of the assumption of European superiority at a cultural level, plus evidence in the field of a far more complex "ecology" of relationships between different species, encouraged a revision of that theory. Rabbits hopped around people's minds as much as in their paddocks, and were very much a part of all this. It was becoming culturally appropriate in New Zealand, by 1897, to condemn European rabbits and stoats and to talk of native bird protection.33

Cronon's last finding is that "historical wisdom usually comes in the form of parables, not policy recommendations or certainties". He believes that "environmental history is at least as important for the way it asks and answers questions ... [as] for any specific problems it may actually solve". It does not offer solutions in the way that science tries to, but it can be a visual aid when looking at current or continuing concerns.

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Carefully cut stories about human interaction with the environment, such as those of how settlers tried to rid themselves of rabbits, are enlightening. This, surely, is "the ultimate object of the discipline".34 Reiteration of these stories, I believe, could have as much value to the modern farmer as it has to the scholar.

33 For a fuller development of this argument, see Paul Star, "Plants, Birds and Displacement Theory in New Zealand, 1840-1900", *British Review of New Zealand Studies* No. 10 (1997) pp. 5-21.
34 S. Ravi Rajan, "The Ends of Environmental History: Some Questions", *Environment and History*, Vol. 3 (1997), p. 249.