

Breed, culture, and economy: The New Zealand frozen meat trade, 1880–1914^{*}

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Abstract

In the late nineteenth and early twentieth centuries, exports of frozen mutton and lamb from New Zealand grew dramatically. Their destination was Great Britain, whose growing population demanded quality meat, and lots of it. Refrigeration technology enabled the trade in frozen meat between New Zealand and Great Britain, but its establishment was more than a matter of equalizing antipodean supply with British demand. This article argues that the trade in frozen meat depended on colonists' abilities to remake their flocks in such a way as to balance the demands of colonial environments with those of British consumers. This resulted in the formation of new breeds like the Corriedale, an inbred cross between the merino and longwool types from Britain, whose hybridity guaranteed suitability for colonial topography and terrain, while its genetic roots ensured that it remained British enough for 'Home' consumption.

By the onset of the First World War, more than thirty years had passed since the first shipments of frozen meat from colonial New Zealand had reached Britain. After modest and uncertain beginnings, with the carcasses of only 4,311 sheep and 598 lambs (plus 22 pigs) carried by the SS Dunedin from the South Island of New Zealand to Great Britain in 1882, the trade in frozen meat had swelled to nearly two million carcasses per annum in 1890, and six million in 1918.¹ Thirty-six factories for freezing beef and mutton had been established in neighbouring Australia and twenty-eight in New Zealand by 1911 and 111 warehouses built to receive and store the frozen meat in the major port cities of the United Kingdom. Over three million metric tons of frozen beef and mutton had traversed the tropics to Great Britain.² In 1918, William Soltau

^{*} An earlier version of this paper was presented at the German Historical Institute's conference, 'Feeding and clothing the world: Cash crops and global history in the twentieth century' in 2011. I am grateful to Janet Browne, Shane Hamilton, David S. Jones, Harriet Ritvo, David Singerman, Daniel C. Wilson, and others who read earlier versions of this piece, and to the editor and referees for their comments. Thanks to John Charles of Massey University Library for his support and assistance. Citations drawn from local and provincial New Zealand newspapers are reproduced from paperspast.natlib.govt.nz by permission of the National Library of New Zealand. The Social Sciences Research Council, Fulbright-IEE, and Fulbright New Zealand funded the research for this article.

¹ William Soltau Davidson, *William Soltau Davidson, 1846–1924. A sketch of his life covering a period of fifty-two years, 1864–1916, in the employment of the New Zealand and Australian Land Company Limited* (1930), p. 37; B. L. Evans, *A history of agricultural production and marketing in New Zealand* (1969), p. 105.

² James Troubridge Critchell and Joseph Raymond, *A history of the frozen meat trade: An account of the development and present day methods of preparation, transport, and marketing of frozen and chilled meats* (1912), pp. 418–20, 422–3.

Davidson, the former manager of the New Zealand and Australia Land Company (NZALC), an Edinburgh firm influential in the early development of the pastoral industry in New Zealand, proclaimed the endeavour to be not only 'one of the most important steps ever undertaken by the Company' but the inauguration of 'a trade which has been of infinite value to the Colony and to the population of Great Britain'.³ The transfer of millions of frozen, partially-butchered sheep across the equator from the antipodes to London had by this time become so much a part of global trade that Davidson's successor could say that '[e]very one is now so familiar with frozen meat that they forget that it had an origin, and that comparatively recently'.⁴

The story of the rise of this trade is most often told as an economic tale, simply, as a story of supply and demand, in which refrigeration technology made it possible for the ovine surplus of the southern hemisphere (South America in addition to Australia and New Zealand) to satisfy the demand of Britain for mutton and lamb.⁵ In New Zealand, where human inhabitants were relatively few, early emphasis on a flourishing wool economy meant that flocks had swelled. But with prices for wool in flux over the course of the nineteenth century, 'that very increase had become a source of embarrassment' to pastoralists and the colony alike.⁶ Particularly in the 1860s when the value of a fleece dropped precipitously, and with so much capital tied up in the bodies of their stock, sheep farmers saw their profits literally consumed in feeding them. For their own prosperity, and for the greater good of the colony, they sought to diversify the pastoral industry, casting about for additional ways to make sheep profitable. Early efforts to salt or tin colonial meat for consumption were not well received in Britain, where consumers 'preferred the real thing',⁷ while 'boiling down' excess sheep into tallow for candles, soap and industrial products offered only slim profits.⁸ At the same time, the population of Great Britain was increasing, the growing appetite of its industrial centres outstripping domestic agricultural production. Consequently, beginning in the 1860s, Great Britain became increasingly reliant on imported food, and by the 1880s, foreign imports were 'critical' to Britain's food supply.⁹ Enter refrigeration technology, which, coupled with transoceanic steam transportation, provided a satisfying resolution for both colonial producers in search of markets, and metropolitan consumers in search of meat, and everyone – everyone but the sheep, that is – lived and ate happily ever after.

The basic outline of this narrative was set by early chroniclers of the trade, and by and large, it has been followed by subsequent scholarship, which has added layers of complexity and

³ William Soltau Davidson, *The establishment of the frozen-meat trade, of the dairying system, and of the Corriedale breed of sheep in New Zealand* (1918), p. 16.

⁴ David Murray, 'Prefatory Note' to Davidson, *Establishment of the frozen-meat trade*, pp. iv–v.

⁵ Examples of this interpretation include Davidson, *Establishment of the frozen-meat trade*; Critchell and Raymond, *History of the frozen meat trade*; Ross Grant, David Jones, R. Ramsay et al. (eds), *The frozen and chilled meat trade: A practical treatise by specialists in the meat trade* (2 vols, 1929). See also Sydney D. Waters, *Clipper ship to motor liner: The story of the New Zealand shipping company, 1873–1939* (1939), p. 51.

⁶ David Jones, 'New Zealand Trade', in Grant et al. (eds), *Frozen and chilled meat trade*, I, p. 130. I am grateful to the anonymous referees of this article for directing me to this source.

⁷ E. J. T. Collins, 'Food supplies and food policy', in Collins (ed.), *The Agrarian History of England and Wales*, VII, 1850–1914 (2 vols, 2000), (i), p. 37.

⁸ E. J. T. Collins, 'Rural and Agricultural Change', in Collins (ed.), *Agrarian History*, VII (i), p. 115; Waters, *Clipper ship*, p. 52; Leonard W. Lillingston, 'Frozen Food', *Good Words* (Jan. 1898), p. 238.

⁹ Collins, 'Food supplies and food policy', p. 34.

sophistication to an analysis that remains, at its heart, economic.¹⁰ Questions of capital and of costs, of incomes and rates and profits, from the level of the individual producer or consumer to the level of imperial trade itself, certainly, are central to how the refrigerated and frozen meat trade took root and flourished in the British Empire. But they are not the whole story.

This article argues that it was more than a matter of equalizing distant supply with demand. The growth and establishment of the trade in frozen mutton and lamb between New Zealand and Great Britain depended to a significant degree on the ways in which colonial producers were able and willing to remake their flocks to meet consumer preference in Britain. To accomplish this, colonists had to reformulate sheep bred for wool into animals capable of producing meat. They had to adapt their stock to new and unfamiliar environments, a challenge more easily met in New Zealand's temperate climate than in drier, hotter Australia, which served as a point of reference and comparison for New Zealand throughout the establishment of the frozen meat trade. New Zealand's own climate and stock were cast as competitive advantages in relation to Australia, where geography and climate alike worked against the technology – biological and mechanical – of the frozen meat trade. At the same time, against growing worries over food security, the British were coming to terms with food of foreign origin, realigning their own tastes and expectations to reflect shifting patterns of production and consumption within the Empire, in which colonial producers came to supply Britons with the beloved joints of mutton that had formerly been almost exclusively domestic. Among the many effects wrought by this momentous shift in production, trade, and diet was the origination of 'native' New Zealand breeds, breeds that could satisfy both the demands of British consumers and the realities of colonial environments, and which embodied the economic and cultural compromise that underlay the imperial frozen meat trade.

I

None of this was a foregone conclusion, although only a few decades of hindsight would make it seem so to both Britons and colonial New Zealanders. In the period leading up to the 1880s, and even into the first few years of the trade, the good sense – or even the possibility – of sending dead sheep on a three month-long journey of more than 13,000 miles was not apparent. Early efforts to engineer artificial cold, and to apply it to the preservation and shipment of meat – a textbook example of a perishable article – had mixed results.¹¹ The transoceanic shipment of frozen meat became a realisable possibility only in 1877, when the first 'completely successful' shipment of frozen meat arrived in France from Buenos Aires,¹² although the 'real origin' of

¹⁰ For example, Evans, *History of agricultural production*; David M. Higgins, "Mutton dressed as Lamb?": The misrepresentation of Australian and New Zealand meat in the British market, c.1890–1914', *Australasian Economic History Rev.* 44 (2004), pp. 161–84; Richard Perren, 'The North American beef and cattle trade with Great Britain, 1870–1914', *EcHR* 24 (1971), pp. 430–44; id., *The meat trade in Britain, 1840–1914* (1978).

¹¹ Starting in the late 1860s, Thomas Mort and James

Harrison in Australia began experimenting with freezing meat, but were unable to ship it successfully in its frozen state. Waters, *Clipper ship*, p. 52; Evans, *History of agricultural production*, p. 104.

¹² This shipment itself was preceded by the not entirely successful attempt of the SS Frigorifique in the same year. R. Ramsay, 'The world's frozen and chilled meat trade', in Grant *et al.* (eds), *The frozen and chilled meat trade*, I, p. 4; Waters, *Clipper ship*, p. 54.

the trade, according to Ramsay, an early chronicler of the frozen meat industry, only came two years later when the SS Strathleven left Sydney in December 1879, reaching London in February 1880, thereby inaugurating 'the beginning of a huge world-wide trade, which, in the short space of half a century, has revolutionized ... the conditions of life in many countries'.¹³

Prior to this, American consignments of chilled beef had pioneered the refrigerated trade. American beef was chilled (but not frozen solid), first by means of coal-powered fans blowing across giant blocks of ice, and later by the circulation of super-chilled ammonia, through insulated holds on ships packed with sides of beef; it arrived at Smithfield market for the first time in 1874.¹⁴ This system, however lucrative for the Americans, was untenable for a trade between the antipodes and Britain, as it not only relied on more space between each suspended side of meat than could be profitably afforded over the much longer journey from Australasia, but also left shipments too vulnerable to the extreme heat of the tropics. When refrigerating engines were developed which were capable of reducing the temperature in a ship's hold enough to maintain sheep and cattle carcasses frozen solid, however, 'a streak of real daylight appeared'.¹⁵

By the time that New Zealand entered the trade in 1882, Australia's frozen meat trade was already established, having sent some 31,469 hundredweights (or 57,256 carcasses) over the course of the previous three years.¹⁶ Prior to this, in the 1860s and 1870s, various schemes to preserve colonial meat were tried, primarily in Australia, with only limited success.¹⁷ Pastoralists in New Zealand watched the fortune of their nearest colonial neighbour with interest as it sought to establish a viable trade with Britain in frozen flesh.¹⁸ Each early shipment of frozen meat from Australia was followed closely in New Zealand, every scrap of news about its fate on the high seas and in London's markets eagerly printed and reprinted in the colony's newspapers. The SS Protos, which left Melbourne in November 1880 carrying 1791 carcasses of sheep and 100 of lamb, in addition to 4,138 casks of butter, six quarters of beef, and various other cargo, remained an item of interest and news in New Zealand for several months, even after it was unloaded in London.¹⁹ How its 'large cargo of meat' was packed (in a 'cool air chamber', with '200 tons of butter in the water tanks underneath it'),²⁰ and the costs of freight, freezing, and handling were all described in detail.²¹ The condition of its cargo (both meat and butter 'were landed perfectly fresh in London')²² and its reception on the British market, both laudatory and critical, circulated throughout provincial newspapers. Information of this kind was carefully accumulated for future reference to New Zealand's own efforts in shipping frozen meat.

¹³ Ramsay, 'World's frozen and chilled meat trade', p. 4. For Waters, the Strathleven signified the 'economic beginning' of the trade, *Clipper ship*, p. 54.

¹⁴ *Ibid.*, p. 53.

¹⁵ Davidson, *Establishment of the frozen-meat trade*, p. 10.

¹⁶ Critchell and Raymond, *History of the frozen meat trade*, p. 422.

¹⁷ Ross Grant, 'The Australian Meat Industry', in Grant *et al.* (eds), *Frozen and chilled meat trade*, I,

pp. 43-4.

¹⁸ Waters, *Clipper ship*, p. 54.

¹⁹ Figures drawn from 'S', 'Meat Export. To the Editor', *Otago Daily Times*, 8 Feb. 1881, p. 3.

²⁰ 'Exportation of Butter to England', *Star* (Lyttleton, New Zealand), 17 Feb. 1881, p. 3.

²¹ 'Export of Frozen Meat', *Timaru Herald*, 24 Mar. 1881, p. 8.

²² 'Exportation of Butter', *Star*, 17 Feb. 1881, p. 3.

From the vantage point of New Zealand, these early Australian shipments were experiments, the outcome of which would help determine the viability of the trade for their own colony. The 'Strathleven Experiment', as the first frozen cargo from Australia was referred to, demonstrated the viability of the frozen meat trade between Australasia and Great Britain, but was also an 'instructive case' that 'proved the practicability of preserving fresh meat in transit at a moderate expense'.²³ The *Protos*, too, was 'a successful experiment' that offered 'proof that before long, Australia and New Zealand would have ships trading to and fro ... and this must result in great benefit to these Colonies'.²⁴

While the passage of these pioneering vessels demonstrated the feasibility of the frozen meat trade, their success was not unqualified. Shortcomings and failures were carefully noted, and interpreted as opportunities for New Zealand to improve upon, and outshine, their 'Australian rivals'.²⁵ Here, the colonies' contrasting climates and environments came into play. In the case of the *Protos*, its cargo reportedly necessitated speedy cooking 'because of the tendency to rapid decomposition'.²⁶ London butchers, too, reportedly complained of the 'dark colour' of the meat.²⁷ But both these faults could be remedied, according to an early proponent of the trade, Mr Skilling, who served as an expert adviser to New Zealand's first freezing corporations. Skilling felt confident that by preserving the meat 'at a less degree of cold than the *Protos*'s cargo was subjected to', rapid decomposition could be forestalled, and that the darkness of its meat, 'while inherent in the meat of Victoria and New South Wales ... would not be characteristic of New Zealand's beef and mutton'. This was because Skilling 'regarded it as a climatic effect' and one that extended to New Zealand's human inhabitants too: 'Not only the meat of this colony, but the men and women too, were fresher and healthier-looking than those of the hotter climates of the sister colonies'.²⁸ Such estimations of the impact of colonial environments on living bodies, both human and animal, were not unusual for the time, and the perceived salubrity of New Zealand's climate thus offered further justification for the colony's entry into the frozen meat trade.

II

Yet even as observers in New Zealand avidly followed the fate of Australia's frozen cargoes, doubt arose over the suitability of this particular export trade. On the one hand, it was important for New Zealand to keep up with its larger neighbour to the west. In December 1880, spurred by the sailing of the *Protos*, a writer for the *Waikato Times* asked, 'Are we to be left behind in the race [to supply Britain with fresh meat], while our more enterprising neighbours in Melbourne and Sydney are reaping the reward of prompt action?'.²⁹ The author of an unsigned letter to the *Otago Witness* in early February 1881 concurred, claiming it would be a 'serious reproach to this Colony should no endeavour be made to participate in the obvious and varied advantages which must result from the undertaking'.³⁰

²³ 'S', 'Meat Export', *Otago Daily Times*, 8 Feb. 1881, p. 3.

²⁴ 'Exportation of Butter', *Star*, 17 Feb. 1881, p. 3.

²⁵ 'A New Zealand meat export company', *Waikato Times*, 23 Dec. 1880, p. 3.

²⁶ 'Frozen Meat Export Company', *North Otago*

Times, 28 Feb. 1881, p. 2.

²⁷ *Ibid.*

²⁸ *Ibid.*

²⁹ 'A New Zealand meat export company', *Waikato Times*, 23 Dec. 1880, p. 3.

On the other hand, whether New Zealand had enough surplus sheep to justify the economic investment and risk represented by the frozen meat trade was a real concern, and discussion of this question characterized early efforts to promote the trade. One of the earliest such efforts was that of the Dunedin Chamber of Commerce. Inspired by Australia's early success, 'gentlemen favourable to the formation of a Frozen Meat Export Company' met under the auspices of the Dunedin Chamber of Commerce on 26 February 1881.³¹ As it happened, the Dunedin-based New Zealand Refrigeration Company, which grew out of the Chamber of Commerce's committee in the following month, was not the first corporate body to export frozen meat from New Zealand: that honour fell to the New Zealand and Australian Land Company in early 1882. However, the Committee's, and subsequently the Company's, widely publicized debates throughout 1881 about the cost and feasibility of the trade set the tenor of the discussion for New Zealand.

The earliest debate centred on a figure given in February 1881 by Matthew Holmes, prominent colonist, and member of parliament.³² Based on a rough estimate of twelve million sheep in New Zealand, of which according to 'the usual calculation', one third 'might be taken as ewes', four million ewes could be expected to return some three million lambs, which in turn would replace the same number of 'old sheep'. According to Holmes, 'two million would be more than enough for local consumption', leaving one million for export.³³ At twenty sheep per ton, that represented 50,000 tons of meat – a 'vast quantity' – available for export per annum.³⁴ However, this estimate of the colony's surplus was not unanimously accepted. For instance, John Drew Atkin, a prolific letter writer and agricultural expert, believed Holmes's figures were out of date. According to Atkin, Holmes was 'evidently thinking of the times ... before the rabbit invasion – when he stated that we should be able to keep up an export of 1,000,000 fat sheep annually'.³⁵ By Atkin's own reading of the colony's stock returns, the total increase in sheep over the five years from 1874 to 1879 was only 133,988 – 'a mere bagatelle.' Unless 'more stringent steps' were taken against the rabbit scourge, Atkins argued, the kind of surplus Holmes suggested was an 'utter impossibility'.³⁶

Atkins was not alone in his point of view. A Dunedin resident writing to the *Otago Witness* on 19 March 1881 under the pen name 'Experientia Docet', asked where Holmes's surplus was now, 'or where has it been for the past five years?' Referring to the low numbers of sheep processed by the New Zealand Meat-Preserving Company, a large corporate body established in 1869 with processing and preserving plants scattered across both islands,³⁷ he wondered with more than a hint of sarcasm, 'Have the ewes been withholding their increase until such can be respectable frozen, and transported to a market where no Dornwell shall retail it at 1d. per lb?'.³⁸

³⁰ 'Frozen Meat', *Otago Witness*, 5 Feb. 1881, p. 7.

³¹ 'Frozen Meat Export Company', *North Otago Times*, 28 Feb. 1881, p. 2.

³² *The cyclopedia of New Zealand, Wellington Provincial District* (1897), pp. 250–1.

³³ 'Export of frozen meat', *Timaru Herald*, 24 Mar. 1881, p. 8.

³⁴ 'Frozen Meat Export Company', *North Otago Times*, 28 Feb. 1881, p. 2.

³⁵ John Drew Atkin, 'Our exports, frozen meat, and the rabbit scourge', *Otago Witness*, 19 Mar. 1881, p. 8.

³⁶ Ibid.

³⁷ Critchell and Raymond, *History of the frozen meat trade*, p. 12.

³⁸ Experientia Docet, 'Export of frozen meat. To the Editor', *Otago Witness* (19 Mar. 1882), p. 8. A. Dornwell was a local butcher in Dunedin who eventually sold New Zealand's first frozen meat to local inhabitants

Local outlets for excess stock, such as Southland – which was among the last regions of New Zealand to be settled, and which offered at least as profitable an outlet as the export trade did, according to the writer – should be exploited before going to the trouble and expense of freezing and long distance shipping, Experientia Docet argued.

Holmes's estimates, as it turned out, were not that far off the mark. In fact, the total sheep population for all of New Zealand in 1881 was closer to 13 million (12,985,058; 13,069,338 in 1878); Otago and Canterbury, the two provinces with the largest ovine populations, had close to three million each. With fewer than 500,000 people to feed in the whole colony in 1881, the two million sheep that Holmes estimated would be left for local consumption after the frozen export of one million represented a whopping 457 lbs per capita per year – a mighty sum indeed. By comparison, people in Great Britain, which had one of the highest rates of meat consumption in the world, ate approximately 110 lbs per capita per year. At any rate, the four shipments made in the first year of the trade amounted to 22,897 carcasses, an impressive number for the nascent industry, but far short of Holmes's estimated one million.³⁹ And rather than deplete colonial flocks, the effect of refrigerated trade was to actually stimulate stock production: by 1886, the national flock was up to 16.5 million; by 1895 to 19.8 million, and with the exception of a temporary drop in 1903, it continued to rise until the close of World War I.⁴⁰

Despite the fears of Atkins and others, the overwhelming perception in colonial New Zealand bore out the surplus indicated by statistical returns. Writing in 1918, William Soltau Davidson recalled that the surplus stock on the New Zealand and Australian Land Company's estates were so numerous that they 'erected yards at the edges of cliffs, into which some thousands of these old sheep were driven, so that they might be knocked on the head and thrown over the precipice as a waste product'.⁴¹ Extreme measures like this may have been out of the ordinary, but very little could be done with sheep past their wool-bearing and breeding prime. Existing relief measures were as unsatisfactory in New Zealand as they were in Australia. Boiling down and the like provided a 'stop-gap', alleviating to a small extent the 'want of an outlet' for colonial flocks, but were, in Davidson's words, an 'unprofitable relief' to pastoralists, as well as an affront to a sense of colonial duty.⁴² And as one Australian commentator put it, 'We had far rather [our flocks] should feed our brothers in the grand old fatherland. You want mutton and beef. We want to send it to you. How can this be done?'⁴³

III

At the same time as New Zealand was confronting the problem of ovine overpopulation, Great Britain was facing an alarming paucity of fresh meat. By the late 1860s, experts and the

Note 38 *continued*

in December 1881 when the crankshaft on the SS Dunedin's refrigerating engine broke and its cargo had to be unloaded. Cf. 'Christmas Relish', *Otago Daily Times*, 26 Dec. 1881, p. 3.

³⁹ Waters, *Clipper ship*, p. 57.

⁴⁰ Figures for this paragraph are drawn from B. L. Evans, *Agricultural and pastoral statistics of New*

Zealand, 1861–1954 (1956), pp. 31, 7.

⁴¹ Davidson, *Establishment of the frozen-meat trade*, p. 10. Similar measures were reportedly resorted to in Argentina. Waters, *Clipper ship*, 53.

⁴² *Ibid.*, p. 52

⁴³ Davidson, *Establishment of the frozen-meat trade*, p. 10; 'Australian Mutton', *All the Year Round* 20, no. 490, 12 Sept. 1868, p. 319.

public alike feared that Britain's growing population would outstrip productive capacity. Meat production was, in reality, doing relatively well by comparison to the rest of British agricultural production, but domestic supply had begun to fall short of demand.⁴⁴ The nation's population was growing, incomes were rising, and consumers were increasingly willing and able to spend money on meat.⁴⁵ And while domestic meat production was growing at a modest rate of 1.5 per cent per annum over the second half of the nineteenth century,⁴⁶ the repeal of the Corn Laws in 1846, signalling the end of agricultural protectionism and the introduction of free trade, drove up the price of meat.⁴⁷ Rising prices were only exacerbated by adverse weather and zoonotic disease outbreaks in the mid-1860s that contributed to 'demographic malaise' in Great Britain's livestock population and high stock mortality.⁴⁸

The slow growth of domestic production, and the fast growth of consumer demand, produced a sense of crisis. In 1868, the nation's meat deficit was 'something alarming', according to a writer for *Chambers's Journal of Popular Literature, Science and Art*, 'being, for Great Britain, over 3,500,000,000 pounds annually', or 156,250 tons short of 'the quantity deemed necessary by physiologists'.⁴⁹ Anxiety over a pending 'meat famine' coincided with an actual rise in average meat consumption in Britain (from 90 lbs per capita in the decade 1861–70, to 110 lbs per capita the following decade) which gave greater credence to such fears.⁵⁰ As the pace of home production slowed relative to population growth and demand, the difference was made up by foreign meat, imported live or as chilled dead meat from Europe and America.⁵¹

The shifting balance towards reliance on foreign meat was hardly less disquieting than the threat of under-supply. The proportion of imported or 'foreign' meat consumed in Britain only continued to rise, from nine per cent in the years 1868–70 to 26 per cent ten years later.⁵² This meant that while one out of every twelve people was fed by foreign meat in 1867, by 1887 one in every four relied on imports to supply their tables with joints of beef and mutton.⁵³ While some of the more boisterous denigrations of foreign supplies came from vested agricultural and pastoral interests opposed to free trade,⁵⁴ disinterested observers also found foreign sources to be less than satisfactory. In the first place, they meant relying on potentially hostile trade partners. In addition, live imports from outside the island might expose domestic herds to contagious diseases like foot-and-mouth disease.⁵⁵

Despite their similarly exogenous origin, live imports from Ireland seemed slightly less worrisome than continentally-sourced imports. In fact, Irish stock that were finished in Britain became the 'backbone of the English fatstock industry' during the shortages of the 1860s and

⁴⁴ Perren, *Meat trade in Britain*, p. 3.

⁴⁵ Higgins, "Mutton dressed as Lamb?", pp. 175–6.

⁴⁶ Collins, 'Rural and agricultural change', p. 116.

⁴⁷ *Ibid.*, p. 110.

⁴⁸ *Ibid.*, pp. 98, 109.

⁴⁹ 'Our Meat-Supply', *Chambers's Journal of Popular Literature, Science and Arts* 257, 28 Nov. 1868, p. 759.

⁵⁰ 'Our Meat-Supply', *Chambers's J.* 2, no. 91, 26 Aug. 1899, pp. 615–16; Perren, *Meat trade in Britain*, p. 3. Prior to World War I, meat consumption in Britain peaked in the first five years of the twentieth century at 132 lbs per capita.

⁵¹ Collins, 'Food supplies and food policy', p. 35; Higgins, "Mutton dressed as Lamb?", p. 166.

⁵² Ernest E. Williams, 'The foreigner in the farmyard', *The New Review* 16, no. 93, Feb. 1897, p. 144.

⁵³ P. G. Craigie, 'Twenty years' change in our foreign meat supplies', *JRASE*, sec. ser., 23. (1887), p. 472.

⁵⁴ Collins discusses the views of agricultural protectionists at length. See Collins, 'Food supplies and food policy', 'Rural and Agricultural Change' and also Williams, 'Foreigner in the farmyard'.

⁵⁵ 'American Meat', *Saturday Review of Politics, Literature, Science and Art* 52, no. 1366 (1881), p. 811.

1870s.⁵⁶ Although they remained potential vectors of contagion, and therefore a possible threat to Britain's herds and consequently the nation's economic wellbeing, Irish feed stock were politically less vulnerable than foreign sources. By the same logic, frozen colonial imports, too, were bound to be safer; both conceptually and actually. Even if they hadn't grazed the rich green pastures of Britain, as they were products of its cultural and economic offshoots, and as dead meat transported 'in a state of what one may call suspended animation', they all but eliminated the threat to public veterinary health.⁵⁷

Health risks and hostile trading partners weren't the only causes for concern over the rising proportion of foreign meat feeding Britons, and worry over undersupply of meat in Britain in the 1860s and 1870s was more than just metabolic or material. In general, Britons considered meat consumption a foundation of their national identity and political pre-eminence, and the basis upon which they distinguished themselves from foreign rivals. It was not uncommon, for instance, for Britons to attribute their greater stature, strength and 'physical superiority' over their perennial rivals the French to their 'better supply of butcher-meat'.⁵⁸ The importance of meat to British identity, as well as to diet, gave a sharper edge to worry about potential under-supply.

Meat formed the nutritional basis of the British diet as well as a figurative basis of national identity, and while Great Britain may have proclaimed itself a nation of beef eaters, mutton held second place in its heart. Equally nutritious as their bovine counterparts, mutton and lamb were important elements of the British diet, and a significant element of national consciousness. In particular, mutton consumption was seen as 'one of the peculiarities of the English race', in contradistinction to other places, where it was merely an 'incidental item in the dietary of the people'.⁵⁹ The agricultural improvements of the late eighteenth and early nineteenth centuries in Britain included great advances in livestock breeding, and the epitome of these developments was Robert Bakewell's 'Improved Leicester', or Dishley breed of sheep, an archetype of well-formed and tasty mutton. By the mid-nineteenth century, the breeding techniques pioneered by Bakewell had been applied with varying degrees of success to a number of other British breeds, including the Southdown, Shropshire and Welsh Mountain sheep.⁶⁰ Britons were willing to acknowledge that other nations possessed the ability to raise fine beef, but they prided themselves on their special national talent for breeding, rearing, fattening and ultimately consuming truly excellent mutton.

Colonial producers recognized the metabolic and cultural importance of meat to their metropolitan brethren. Writing in 1929, after the establishment and solidification of the frozen meat trade, David Jones, Chairman of the New Zealand Meat Producers' Board, observed that 'the Briton is a great meat eater and his taste today in this direction is as pronounced as in the

⁵⁶ Collins, 'Rural and agricultural change', pp. 98, 111.

⁵⁷ 'The Australian Meat-Trade', *Chambers's J.* 11, no. 538, 21 Apr. 1894, p. 246; Evans, *History of agricultural production*, pp. 83–4.

⁵⁸ 'Our Meat-Supply' (1868), p. 759; Harriet Ritvo, 'Mad Cow Mysteries', in her *Noble Cows and Hybrid Zebras: Essays on animals and history* (2010), pp. 99–100;

ead., *The Platypus and the Mermaid and other figments of the classifying imagination* (1997), pp. 194–7.

⁵⁹ Ramsay, 'The world's frozen and chilled meat trade', p. 11.

⁶⁰ Harriet Ritvo, 'Possessing Mother Nature: Genetic capital in eighteenth-century Britain', in Susan Staves and John Brewer (eds), *Early modern conceptions of property* (1995), pp. 413–26.

days gone by, when for his sustenance he depended solely on his herds and flocks'.⁶¹ Recognition of the national fondness for sheep meat was among the motivations that stimulated refrigerated trade between the antipodean colonies and Great Britain.

IV

With the onset of refrigerated shipping, however, all was not smooth sailing. Britons were fascinated by the technology that produced 'artificial cold' – they marvelled at the workings of refrigerating engines, and the interior climate of cold storage warehouses ('among the most wonderful of recent developments')⁶² – but they were at first wary of actually consuming frozen beef and mutton. British diners had to be convinced that mutton which had 'cropped pasture land 13,000 miles away, and been dead from six to nine months, or even longer' was good to eat.⁶³ The unpopularity (and unpalatability) of tinned meat from the colonies initially turned the British market away from the frozen variety of the same provenance. Moreover, Britons worried about the effect of the freezing process on the 'nutritive value' and tastiness of meat.⁶⁴ They particularly feared that the blood, and consequently nutritional value and flavour, would seep out of the meat during the thawing process, leaving it in a 'dry and tasteless condition'.⁶⁵

Distributors of the colonial harvest of mutton and lamb overcame this initial prejudice in two ways, by undercutting home-grown competition and by fraud. As a writer for the *New Review* put it in 1897:

We do not eat Frozen Mutton and Refrigerated Beef because an Arctic temperature improves their flavour, or because the breeds and pasturage in other countries make better Meat than we can grow. We import them because they are cheap.⁶⁶

By the virtue of its availability, and because it retailed for several pence less per lb than home-grown mutton of similar quality, colonial mutton found purchasers, even if not from among the most discerning epicures, in the early days of its trade. Throughout the 1880s, colonial mutton sold for roughly 1d. less per lb than home-grown, and by 1896 prime New Zealand mutton was 2½d. less per lb than the top end of the Britain's produce, while Australian mutton (alongside Argentinean) bottomed out at 4½d. less.⁶⁷ It was hard for consumers to resist such value, and the prejudice against frozen meat, some commentators observed, was 'mainly a middle-class one after all'. Before Australasian beef and mutton became widely available, meat was dear enough to limit its consumption by the working class, even though it made up a larger proportion of the labourer's diet in Britain than it did in most of Europe.

Despite assertions that discerning palates could tell the difference between locally raised and colonial imports, there were no official measures in place to stop retailers selling colonial meat as home-produced. The best colonial meat, it was asserted again and again, though excellent,

⁶¹ Jones, 'New Zealand Trade', pp. 131–3.

⁶² 'Australian Meat-Trade', p. 247.

⁶³ Lillingston, 'Frozen food', p. 238.

⁶⁴ 'Our Meat-Supply' (1899), p. 616.

⁶⁵ 'A visit to the Australian Frozen Meat Company's works', *Leisure Hour* (Sept. 1882), p. 560.

⁶⁶ Williams, 'The foreigner in the farmyard', p. 149.

⁶⁷ 'Annual statement of the trade of the United Kingdom with foreign countries and British possessions for the year 1885', *Quarterly Rev.* 165, no. 329, July 1887, pp. 54–5; Williams, 'Foreigner in the farmyard', p. 150.

did not measure up to the very best domestic meat, so that butchers selling the 'bountiful supplies from the Antipodes' as Scotch and English mutton could make an extra profit.⁶⁸ The extent of fraud in marketing frozen meat from Australia and New Zealand, however, was probably more limited than anxious publications on the topic from the time suggest, not least because meat that has once been frozen presents a different appearance than meat which has never been frozen, offering an immediate visual cue to most purchasers as to the provenance (at least in broad geographical terms) of their supper.⁶⁹ Nevertheless, concern about actual and potential fraud was sufficient to convene a select committee in the House of Lords in 1893 on the 'Marking of Foreign Meat'.⁷⁰ Various representatives of the trade paraded before the Committee, giving evidence (sometimes contradictory) as to the quality and distinguishability of colonial versus home-grown meat, and to the persistence of fraud in London and provincial cities.⁷¹

David M. Higgins has conducted a detailed analysis of the evidence given to the select committee, and concluded that not only was fraud less prevalent than contemporaries supposed, its effects were also less pernicious. Had fraud existed on a significant scale, Higgins argues, the price differential between meat of foreign origin, including colonial, and domestically-produced meat would have narrowed over time. That this did not occur suggests a relatively low degree of fraud in the marketplace. What misrepresentation existed, Higgins concludes, was practiced over a relatively short span of time in the early years of the trade.⁷² Moreover, outrage over the misrepresentation of the point of origin of meat expressed an objection to the act of fraud itself, not necessarily a prejudice against foreign or colonial meat. That is, consumers objected to being sold a false article (colonial meat passed off as British), not necessarily to colonial meat per se.⁷³ Britons wished 'to exercise their patriotic preference in favour of domestic meat', and misrepresentation of colonial mutton as British prevented them from doing so.⁷⁴

While the misrepresentation of colonial meat did not line the pockets of British butchers in any economically significant way,⁷⁵ the persistence of claims about fraud suggest that, even if such worry was overinflated, it remained culturally significant. Concerns about the misrepresentation of meat to British consumers spoke to precisely that centrality of meat to their daily lives and national identity. In the early days of the trade, misrepresentation also served in a roundabout way to overcome 'the extreme prejudice with which frozen meat was at first regarded'.⁷⁶ As one astute observer noted, in 1879 'The British public would in theory have nothing to do with Australian mutton; but somebody appears to have eaten it, for the next year 17,275 carcasses came into this country'. This he attributed to the strong likelihood that 'a great deal of it was sold as home fed, so that the consumer, through his own ignorance and folly, not only ate Colonial mutton against his wishes, but had to pay more than its market value'.⁷⁷

⁶⁸ 'Australian Meat-Trade', p. 237.

⁶⁹ Higgins, "Mutton dressed as Lamb?", pp. 173, 175, 177.

⁷⁰ BPP, 1893-4, XII, *Report from the select committee on marking of foreign meat, etc., together with the proceedings of the committee, minutes of evidence, and appendix* (1893).

⁷¹ Higgins, "Mutton dressed as Lamb?", pp. 167-71.

⁷² *Ibid.*, p. 182.

⁷³ *Ibid.*, p. 176.

⁷⁴ *Ibid.*, p. 174.

⁷⁵ According to Higgins's analysis.

⁷⁶ Lillingston, 'Frozen food', p. 237.

⁷⁷ *Ibid.*

While being duped into paying top prices for 'prime Scottish, and best Welsh or Southdown' even when 'the beasts whose remnants filled [the butcher's] cart have never known the taste of Scots or English grass' may have given the lie to the supposed national talent for judging meat, colonial pastoralists could not afford to ignore the tastes of the British consumer.⁷⁸ Australian pastoralists quickly learned that they could not simply export mutton grown as a by-product of their wool industry to hungry, waiting consumers in Britain, and, as in so many other aspects of the frozen trade, New Zealand also watched and learned. Though many in the southern colonies believed that 'it would be hard to beat for flavour a leg of mountain-fed Merino wether in good condition', Britons were not 'sufficiently colonial' to agree.⁷⁹ The palatability of merino mutton had for some time been a matter of debate in England, and Australian-grown merino chops fared no better than had their homegrown equivalent of a generation or two earlier. Britons felt strongly that different social classes required different cuts of meat, but just what was considered appropriate for each stratum of society was open to interpretation. Sometimes, experts and commentators exhorted the middle and upper classes to choose lean, more refined cuts of meat, leaving the fat joints to the working classes.⁸⁰ At other times, it seemed that fat joints were necessary to the physiological and intellectual lives of the middle and upper classes, while lean cuts sufficed to power the lower orders engaged in rough, unrefined physical labour. In keeping with the latter view, observers felt that the earliest shipments of lean, frozen merino mutton were 'too small and delicate to suit the taste of English buyers', nor did the manner in which the carcasses were dressed 'altogether meet with the approval of the butchers' in the metropolis.⁸¹ Observers thus pointed to the northern mining districts as markets for merino mutton, where 'those engaged in less exacting physical occupations prefer lean meat', unlike members of the middle class, for whose refined occupations a fat joint of mutton or lamb was more fitting.⁸² Merino cutlets may have been fit 'to sustain the English workman, and make abundant meals for the destitute' but they would not do for 'the paterfamilias of middle life as his cut-and-come-again dinner joints'.⁸³

In the end, it fell mostly to the lower classes to absorb the colonial contribution to Britain's meat supply. According to Higgins, evidence given before the select committee of the House of Lords suggests that poor and working-class inhabitants of London and other major industrial centres were 'the greatest consumers of all types of foreign and colonial meat'.⁸⁴ High-end London butchers were a sometimes inadvertent exception to this, because with the large joints favoured by their well-heeled clientele, point of origin was more difficult to distinguish than in the smaller cuts.⁸⁵ Fraudulent distribution of colonial meat, then, was limited in extent, and largely circumscribed by class, and except where top-end purchasers ended up with New Zealand instead of 'prime Scotch', the lower prices of meat from New Zealand and Australia, as well as South America, made it more attractive to the poor.

Australian producers initially looked towards 'educating the "Home" taste' as a solution to

⁷⁸ Williams, 'Foreigner in the farmyard', p. 151.

⁷⁹ 'How down mutton went down', *New Zealand Farmer* 12, no. 9, Sept. 1892, p. 370.

⁸⁰ Ritvo, *Platypus and the Mermaid*, p. 200.

⁸¹ 'Visit to the Australian Frozen Meat Company's

works', p. 560.

⁸² Lillingston, 'Frozen food', p. 239.

⁸³ 'Australian Mutton', p. 320.

⁸⁴ Higgins, "'Mutton dressed as Lamb?'" , p. 172.

⁸⁵ Ibid.

the unpopularity of their colonial merino mutton.⁸⁶ '[T]here is no reason why the English taste should not be educated to a proper appreciation of merino mutton', wrote one contributor to the *Australasian Pastoralists' Review*, the pre-eminent agricultural journal of the colonies.

[I]f the sheep are killed near their pastures, and accordingly have not suffered deterioration from a long journey, consumers may speedily find that though merino mutton is somewhat less sightly in appearance when thawed than crossbred, its flavour is by no means inferior.⁸⁷

Britons, however, were proud of their exacting palates. *Chambers' Journal* reported in 1877 that 'we should confidently say that no people on the face of the earth are such connoisseurs in good beef and mutton as the English, down even to the humblest classes'.⁸⁸ Consequently, they were not likely to be re-educated in matters of taste by their colonial cousins, and, having watched the reception of Australian mutton on the British market, pastoralists in New Zealand alike conceded that 'colonial tastes in this matter could not affect the question'.⁸⁹

V

In the new trade, colonial pastoralists saw an opportunity to revitalize a pastoral economy that, because of its emphasis on a single product, wool, was very much at the mercy of the vicissitudes of international markets. Although wool remained the colony's primary export product, the refrigerated trade quickly became crucial to New Zealand's economic well-being, pulling the colony out of the global economic depression of the 1890s.⁹⁰ But even with a surplus of sheep to hand, success in the frozen meat trade was not simply a matter of slaughtering the excess sheep from a flock bred for wool. As any good breeder in the late nineteenth century knew, sheep bred for wool did not necessarily produce good meat. In fact, the case was more often quite the reverse. The relationship between the weight and texture of a fleece on the one hand, and the carcass on the other, was a problem which had already occupied breeders in England for several hundred years. Whether or not the mechanisms of heredity, fattening, and wool growth were well understood, experience suggested that producing excellent mutton and superior wool were more or less mutually exclusive. From the late eighteenth century onward, this principle was reinforced by a tendency towards specialization in English sheep-breeding in which breeding for mutton was largely divorced from breeding for wool, producing ever more specialized types of sheep designed to eke maximum efficiency and profit out of particular regional conditions and economies.⁹¹

By the late 1870s, at the outset of the trade in frozen meat between Australasia and Great Britain, there existed a wide variety of British breeds, each with its own special talent or use,

⁸⁶ 'Mutton Cutlets', *New Zealand Farmer* 12, no. 2, Feb. 1892, p. 37.

⁸⁷ 'The frozen meat industry', *Australasian Pastoralists' Rev.* 3, no. 2, 15 Apr. 1893, p. 72.

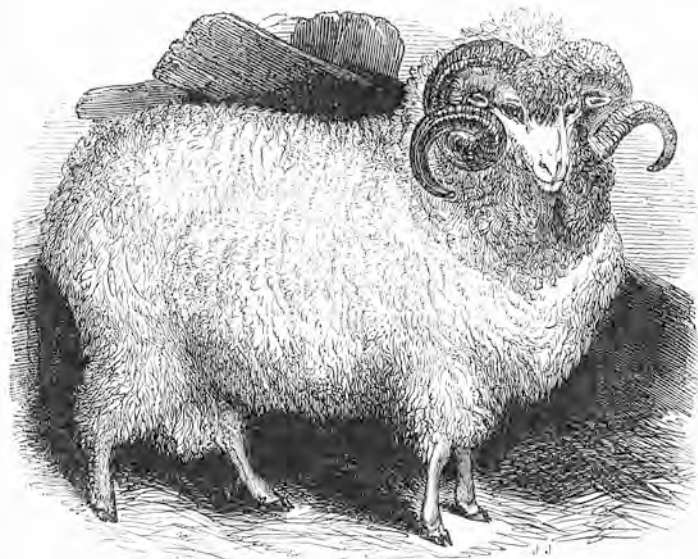
⁸⁸ 'Imported Beef and Mutton', *Chambers' J.* 695, 22 Apr. 1871, p. 253.

⁸⁹ 'How down mutton went down', p. 370.

⁹⁰ Evans, *History of agricultural production*, p. 90.

Only twice was wool surpassed as the most valuable export before the second half of the twentieth century: by gold in 1860s and by meat and butter in 1930s. *Ibid.*, p. 89.

⁹¹ Nicholas Russell, *Like Engend'ring like: Heredity and animal breeding in early modern England* (1986); Robert Trow-Smith, *A history of British livestock husbandry* (2 vols, 1957).



[Merino Ram.]

FIGURE 1. Merino ram, from William Youatt, *Sheep: Their breeds, management, and diseases*. To which is added the *mountain shepherd's Manual* (1837).

although not all were readily available in Australia or New Zealand. The antipodean ovine surplus consisted primarily of merino sheep, originally a Spanish breed, known for both its fine wool and the poor quality of its flesh.⁹² They predominated in Australia where their importation to the colony dated back to 1796 when John McArthur brought the first merinos from the Cape of Good Hope to New South Wales. The breed was also prevalent in the high elevations of New Zealand's South Island (Figure 1). The varied regional terrain and climate of New Zealand's islands had encouraged sheep farmers to stock more breeds than just the merino even during the heyday of the colonial wool trade, some of which were now desirable as 'freezers'. Lincoln Longwools, producing a long, heavy, lustrous wool for the worsted manufacturing industry, and Leicesters, known for their heavy, fatty carcasses and weighty fleeces, could also be found in New Zealand. Much rarer were such breeds as Southdowns and Shropshires, the latter a relative latecomer to the British breeding scene: it was shown in its own category at the Royal Agricultural Society of England's show for the first time in 1868. These were champion mutton-makers, producing a pleasantly plump leg but only a lightweight fleece of medium quality, making them (at least in the early days) relatively unpopular in the colonies.⁹³

Determining which sheep to breed where depended on a number of considerations, some economic, some environmental, and some cultural. Given the distance between the Australasian colonies and the markets in Great Britain and Europe, the difficulties in preserving and transporting meat prior to the advent of frozen shipment, and the relatively tiny size of colonial human populations, emphasizing wool production in Australia and New Zealand made perfect sense. Wool was lightweight and never went bad; consequently it was easy to

⁹² Evans, *History of agricultural production*, p. 82.

⁹³ Corin (pseud.), 'The management of sheep on

small farms', *New Zealand Farmer* 12, no. 5, May 1892, p. 197.

store and ship. Moreover, its production was labour-intensive only at specific times of year, namely at lambing season and during shearing, and so was well-suited to the low population density of the Australasian colonies. For most of the nineteenth century this served Australia, in particular, extremely well: its hot, dry climate seemed uniquely suited to the merino sheep, whose wool was, then as now, the standard in fineness and value. Indeed, Australia appeared so well-appointed for sheep farming that its lack of indigenous ovine species came as a 'curious fact' to nineteenth-century commentators.⁹⁴ For decades the colonies' vast flocks of merinos grazed equally vast sweeps of land, their hooves reshaping native ecosystems as their golden fleeces produced both metropolitan and colonial prosperity.⁹⁵

In New Zealand, regional environments and climates were colder, wetter, more temperate, and more varied than in Australia, and the wool produced, as well as the breeds of sheep that grew it, was likewise more various. Whereas Australia's flocks produced almost exclusively the very fine grades of merino wool, the merino, lover of extreme heat or cold, but nothing in between, thrived only in the cold, high altitudes of New Zealand's craggy Southern Alps. The lowlands and river valleys of much of New Zealand were too wet for the erstwhile Spanish sheep, who suffered foot rot in such damp conditions, so longwooled breeds like the Leicester and Lincoln were needed to graze these moister regions. The clip from these flocks may not have returned such high prices as those of merino flocks, but to some extent quantity could make up for a relative lack of quality. At a time when the international wool trade alone determined profitability, longwooled breeds made otherwise unsuitable lands lucrative. Later, with the establishment of the frozen meat trade, these heftier breeds proved profitable to New Zealand's pastoralists in their own right.

When it came to the advantages of climate and environment, New Zealand really did have a leg up over Australia. Early Australian shipments had proved that the transoceanic shipment of frozen meat was possible, but the island continent's extreme heat and aridity was detrimental to producing frozen meat. Not only were the pastures on which Australian flocks (and herds, for that matter) grazed hot and arid, and the vegetation often sparse, requiring any sheep raised there to roam far and wide for their feed, the southern continent's irregular meteorological patterns and recurrent drought played havoc with the fortunes of livestock. These conditions favoured merino sheep, but were a challenge to the breeds that Britons preferred to eat. Selected for the damp, verdant pastures of the British Isles, they could ill withstand the periodic drought and dry heat that characterized much of the southern continent.

Moreover, Australian rangeland was hundreds of scorching, dusty miles from the port cities of New South Wales and Victoria, no easy trip for mutton in either its live or frozen state. Transport by rail challenged the export product in both stages of processing: if shipped live to be slaughtered and frozen at coastal freezing works, sheep were likely to be knocked about and bruised, to weaken, grow thin and lose their 'condition', the 'deterioration in quality thereby produced [preventing] the meat taking first rank and having any chance as a competitor with meat killed near the pasture'.⁹⁶ But if frozen inland and transported in refrigerated rail cars,

⁹⁴ 'The Australian meat-trade', p. 246.

⁹⁵ Libby Robin, *How a continent created a nation* (2007); Elinor G. K. Melville, *A plague of sheep:*

Environmental consequences of the conquest of Mexico (1994).

⁹⁶ 'The frozen meat industry', p. 72.

the frosty load was vulnerable to total destruction should any mechanical failure or other impediment stall the cargo and leave it exposed to the punishing heat and sun of the continent. '[I]t is during this transition that the success of the whole undertaking is most endangered', one observer noted, 'for if the meat becomes at all thawed or softened in transit, the carcasses thus affected, when unshipped in the London Docks, present a most unpalatable appearance, being misshapen and discoloured, and are ... condemned ... as being unfit for food'.⁹⁷ There was no quick fix for this dilemma, and it wasn't until the early years of the twentieth century that refrigeration and transport technology advanced sufficiently to allow for reasonably risk-free inland freezing in Australia.

The climatic challenges that made Australia 'not so suitable for killing and freezing' sheep put it at a disadvantage relative to its eastern neighbour, whose average temperatures were lower and whose pastures were often situated nearer to its ports.⁹⁸ Yet Australian mutton developed a reputation for being second-rate not only because its product lacked the 'finishing' that came as a consequence of proximal pastures and abattoirs, but also because of British preferences. Cheap meat could always find a market in Britain, but no matter how good the price, Britons would almost always prefer the mutton of a 'native' British breed over the that of the merino. 'Englishmen prefer', wrote a contributor to the *Saturday Review*, 'from taste or habit, English meat'.⁹⁹ This marked preference – some called it a 'groundless' prejudice – presented an opportunity for New Zealand to capitalize on its more diverse colonial flocks.¹⁰⁰ New Zealanders were well aware that 'though we can't come near Australia in the fineness and lightness in grease of our wool clip, we have all the advantage in climate for taking the lead in meat production'.¹⁰¹

Which breed of sheep was best suited to their new surroundings was not a new question for breeders in New Zealand. A simple question in Australia, where in all but a few regions merinos thrived, it was a complicated one in New Zealand. 'Everything depends on the kind of pasture a sheep is sustained on', wrote T. H. Anson, an early authority on sheep-breeding in the Canterbury region, in 1877. '[W]hether it will attain to a point as near perfection in carcass and wool bearing capabilities as possible; or, on the other hand, whether it degenerates every year in both' came down to the resonance between the land and the breed.¹⁰² Colonial breeders in New Zealand were well aware that the British Isles had produced regional types bred for local climatic, environmental, and of course economic conditions. 'In England the natural habitat of the different breeds has been long since determined', declared an essayist for the *New Zealand Farmer, Bee and Poultry Journal*, 'and we should in vain look for a Southdown in the fens of Lincolnshire, or a Lincoln on the chalk downs of Sussex or Hampshire'.¹⁰³ As they learned the lay of their new land, they were also increasingly aware that the hills, dales, plains and river valleys of New Zealand were like, but not *quite* like, 'Home'. Consequently, as types bred for particular local conditions in the British Isles, British breeds were close, but

⁹⁷ 'Visit to the Australian Frozen Meat Company's works', p. 561.

⁹⁸ Lillingston, 'Frozen food', p. 239.

⁹⁹ 'American Meat', p. 812.

¹⁰⁰ 'Frozen Food', *Chambers' J.* 20, no. 1020, 14 July 1883, p. 439.

¹⁰¹ Taylor White, 'Cross-breeding of sheep', *New Zealand Farmer* 12, no. 5, May 1892, p. 198.

¹⁰² T. H. Anson, 'On Sheep', *New Zealand Country J.* 1, no. 3, July 1877, p. 190.

¹⁰³ Corin, 'Management of sheep on small farms', p. 197.

not *quite* right for the colony. These uncannily familiar yet strange lands could be modified to a degree – they could be (and were) sown with English grasses, drained or irrigated – but fundamental attributes such as altitude, exposure, climate, wetness, and temperature could be little modified.

VI

Sheep, on the other hand, were far more malleable. They could be remolded to fit the land with more ease than the land could be refigured to suit the breed. ‘We must adapt our sheep to the character of land we possess’, Anson exhorted other pastoralists, and the readiest, most effective way to do this was by crossbreeding disparate types in order to combine their traits in one variety.¹⁰⁴ Crossbreeding was initially undertaken in New Zealand as a way to maximize wool production, but its means were easily reoriented to a new end when British markets opened up to colonial mutton with the establishment of the frozen meat trade. In this enterprise, colonial breeders in New Zealand followed the example of late eighteenth- and early nineteenth-century breeders in Britain who had, with great enthusiasm, crossbred local varieties in the name of improvement. In colonial New Zealand, the same methods were employed, but in the hope of hitting upon the right combinations of characteristics for particular places. In this context, improvement indicated a desire to reconfigure existing breeds into new breeds ‘native’ to the colony.

Early efforts to place the right type of sheep on the right type of pasture operated upon the theory of a cooperative ‘chain of breeding’.¹⁰⁵ By crossbreeding merinos and longwooled breeds according to this principle, the properties of the merino – notably its fineness of wool – could cascade down from the high country sheep stations, through the foothills and river valleys, becoming proportionally more dilute among the flocks in the approach to the lowlands and marshes. In the other direction, size, carcass weight, and weight of fleece – all markers of the longwooled breeds – could climb gradually toward the highlands, the exclusive domain of the pure merino. In theory, this model meant that each sheep farmer could attain, by carefully calibrating his crossbreeding program, the right type of sheep for his pastures. Even under the best execution of this principle, however, whatever type of sheep thus attained would have to be constantly recreated, as crossbred animals only breed true to type under very special circumstances. The more likely outcome, however, was a very imperfect implementation of the ‘chain of breeding’. Choice of breed often had as much to do with personal preference as with anything else, and critics had reason to lament the ‘very strong inclination on the part of many farmers to disregard the character of the land, and to be guided in their selection more by their fancy for a particular breed than by its suitability for the conditions under which it would have to be maintained’.¹⁰⁶

Nevertheless, these foundations served the pastoral interest in New Zealand well in the 1880s. The aim was no longer to produce the heaviest, most profitable fleece from a given

¹⁰⁴ Anson, ‘On sheep’, p. 190.

¹⁰⁵ John McBeath, ‘Cross-breeding of sheep’, *New Zealand Country J.* 1, no. 4, Oct. 1877, p. 267. Italics

original.

¹⁰⁶ Davidson, *William Soltau Davidson*, p. 23.

piece of land, but to balance wool production with a carcass which would fetch the best return on British markets. And fetching a high price in London, Liverpool, or Birmingham meant catering to the tastes of British consumers. This entailed weighing carefully the demands of colonial environments with the imperative of metropolitan markets. While colonial breeders felt certain that 'the sheep farmers out here are naturally the best judges' of which 'particular line of breeding' suited local conditions, they acknowledged that 'London salesmen would, of course, know best what breed of sheep produced the mutton that sold for the highest price in their markets'.¹⁰⁷ Opinion varied as to whether that breed was a Southdown, Shropshire, or something else, but all – in the metropole and colonies alike – agreed that the crossbred flocks of New Zealand 'suit[ed] the taste of English purchasers'¹⁰⁸ and were 'more highly esteemed in the English market than the merinos which Australia chiefly furnishes'.¹⁰⁹

The problem with crossbred sheep was that by their nature they produced instability and uncontrolled variation down the generations, the very thing that close and sustained inbreeding was designed to forestall. While a first generation cross between a longwooled breed and a merino might dependably give rise to an animal combining the weighty fleece of the one with the fineness of the other, the offspring of *that* generation, depending on whether it was bred to a longwool or a merino, 'naturally throws to the extremes' of one or another of its 'parent stock', and the result could not be guaranteed as an improvement over the breed in question in its pure state.¹¹⁰

The uncertainty and variability inherent in this endeavour caused much anxiety. Breeders feared the colony's flocks were in a hopeless muddle, and that a lack of particularity had created an indeterminate horde of 'mongrel-bred' sheep with no distinction, hence no predictability in breeding.¹¹¹ What was needed was a new breed, distinctly colonial but capable of satisfying the tastes of the most discerning British consumers. It was important that this breed be 'native' to the colony: 'English bred sheep are not exactly what we want', breeders recognized as early as 1877, as they were apt to alter in some way in unfamiliar colonial environments, whether that meant succumbing to disease, failing to fatten, or growing coarse or rangy. Rather, New Zealand wanted 'some native breeds, which shall not need to go through a course of acclimatisation, nor be periodically reinforced by new blood imported for the purpose, thus making us dependent on foreign breeders for our stock'.¹¹²

VII

The challenge was how to achieve this, given the intrinsic instability of crossbred varieties. 'We want a Bakewell to fix up a new type of sheep of permanent characteristics' was the call that sprang from the pages of the *New Zealand Farmer* in 1892. The 'new type' should be 'neither

¹⁰⁷ W. Weddel, quoted in 'The mutton of most value in London markets', *New Zealand Farmer* 12, no. 12, Dec. 1892, p. 476; Evans, *History of agricultural production*, pp. 84, 86.

¹⁰⁸ 'Visit to the Australian Frozen Meat Company's works', p. 560.

¹⁰⁹ Lillingston, 'Frozen food', p. 239.

¹¹⁰ *The Corriedale, New Zealand's own breed: history and development* (1936), p. 11.

¹¹¹ Anson, 'On sheep', p. 190; Evans, *History of agricultural production*, p. 84.

¹¹² 'Cross-bred Sheep', *New Zealand Country J.* 1, no. 4, Oct. 1877, p. 269 (and originally published in the *Southern Mercury*).

too large or the reverse, of a muscular or fleshy character, and one to arrive at the standard of weight and condition in eighteen months time'.¹¹³ While crossbreeding might produce a good terminal product for the freezer, breeders wanted a fixed and reliable type, 'the best stamp of ... breed for the freezing trade': they wanted, in essence, to replicate the advantageous points of a crossbred in a pure breed able to reproduce itself with consistency.¹¹⁴ To do this, they had only to follow the lead of their British predecessors and apply the principles of inbreeding to their crossbred stock. Though few would admit it, the most successful of the breeders of the late eighteenth and early nineteenth centuries, including Bakewell himself, most likely infused the target of their improving zeal with genetics (or 'blood') from another breed, subsequently inbreeding intensively to eliminate other than the desired characteristics. And indeed, this is just what experimental breeders in New Zealand did.

Creating an 'inbred crossbred', as it came to be called, was not entirely without controversy.¹¹⁵ Debate over which existing British breeds should be used to create 'New Zealand's own' kept the *New Zealand Farmer* in print for several decades. Efforts to fix a crossbred type began as early as the 1870s. James Little, manager of the Corriedale Estate near Oamaru in North Otago, began intensively inbreeding successive generations of merino ewes crossed with Lincoln rams at almost the same moment that William Soltau Davidson of the NZALC, dissatisfied with the 'uneven' nature of the 'three-quarter-breds', determined to fix the half-bred type ('It was the half-bred sheep we wanted and nothing more or less').¹¹⁶ The honour of establishing what was later hailed as 'entirely a New Zealand production'¹¹⁷ is usually shared between the two men, although the breed came to be called the Corriedale after the station at which Little was manager at the time of experimentation.¹¹⁸ With time, the NZALC's flock became the first continuously bred flock of Corriedale sheep, helping to establish the breed as New Zealand's own 'native' breed 'kept perfectly pure and inbred' for the remainder of the nineteenth century, though crossbred mutton of various parentage continued to fill the holds of the refrigerated steamers plying the seas between New Zealand and Great Britain (Figure 2).¹¹⁹

Creating an 'entirely new' breed was one way to produce 'native' breeds for New Zealand; adapting existing breeds to colonial conditions was another. This second course characterized what became known as the New Zealand Romney – or simply the Romney – sheep in the latter decades of the nineteenth century. Known in Britain as the Kent or Romney Marsh breed of sheep in recognition of its origins, Romneys initially became popular in New Zealand because of their resistance to footrot. With the growth of the refrigerated trade, preference for Romneys grew, as their quickness to maturity and meaty carcasses suited the demands of the industry. Although this creolized breed quickly outpaced the Corriedale in numeric strength on the North Island of New Zealand, and soon after on the South Island, Corriedales remained a significant presence. In 1924, Corriedale stud sheep were second only to Romneys, with 39,563 studs entered in the New Zealand Flock Book (152,110 Romney studs were entered).

¹¹³ White, 'Cross-breeding of sheep', p. 198.

¹¹⁴ Weddel, quoted in 'Mutton of most value', p. 476.

¹¹⁵ 'Mutton of most value', p. 476.

¹¹⁶ Davidson, *William Soltau Davidson*, p. 23.

¹¹⁷ Jones, 'New Zealand trade', p. 119.

¹¹⁸ Clutton-Brock and Hall note the popularity of a

similar Lincoln-merino cross in Germany and Ireland in the 1860s and 1870s. Stephen J. G. Hall and Juliet Clutton-Brock, *Two hundred years of British farm livestock* (1989), p. 139.

¹¹⁹ Murray, 'Prefatory note', p. iv.



FIGURE 2. A flock of Corriedale cross sheep, Cheviot Hills Station, Canterbury, New Zealand, c.1893. Reproduced by permission of the Alexander Turnbull Library, Wellington, New Zealand.

Corriedales were followed by Southdowns at 35,047 entries, and merinos at 28,479.¹²⁰ Estimates of non-breeding flocks put Corriedales in fourth place, with 642,782 sheep after close to three million Romneys, 1.4 million Half-bred, and 875,279 merinos.¹²¹

In 1923 the Corriedale Sheep Society published the first volume of its flock book, recording the pedigrees of more than 100 purebred flocks. By then, 'prime Canterbury' was a synonym for excellence on the British markets, and the Corriedale was promoted as both New Zealand's own quintessential 'native' breed, and the ideal universal mutton-maker.¹²² Whilst New Zealand breeders were proud of how widely the breed had been exported – to Australia, South America, North America, Russia and even Japan – at the same time they celebrated its unique identity as a 'native' New Zealand breed. No other breed was 'so suited as the Corriedale [was] to ... the sheep lands of the Dominion', enthused the breed's first historian, G. H. Holford,

¹²⁰ After that, English and Border Leicesters at approx. 23,000 each, Lincolns at 17,392, and Shropshires at 3,609. Jones, 'New Zealand trade', p. 117.

¹²¹ The only other breed to exceed 100,000 were

Lincolns at with around 200,000. Jones, 'New Zealand trade'.

¹²² Weddel, in 'Mutton of Most Value', p. 477.

or so capable of producing 'magnificent mutton'.¹²³ While acknowledging that 'the British breeds of sheep are unsurpassed for the particular purpose for which they have been created', Holford gave credit to the Corriedale as an ingenious creation capable of taking advantage of the natural attributes of vast swaths of what environmental historians have recognized as the 'neo-Europes' of ecological imperialism. British breeds had taken root in New Zealand because of its affinities to 'the Homeland', but the stronger affinities among 'the upland sheep lands of the Dominion' made the Corriedale, as a 'sheep bred to suit this class of country', eminently suited to commensurate pastures 'in foreign lands'.¹²⁴

As a dual-purpose breed combining wool and mutton production, the Corriedale was hailed as a return to the natural. The trend towards combining wool and mutton production, spurred by the frozen meat trade, '[was] not – as [was] often supposed – away from the nature of the ... animals in their original state, but rather back to that original state'.¹²⁵ Millennia of domestication, the breed's boosters argued, had 'naturally' produced dual-purpose sheep: it was only relatively recently that modern breeders had disaggregated flesh and fleece to produce the highly specialized breeds of the late nineteenth century. According to this reasoning, although the Corriedale was a newcomer among sheep breeds, it represented 'a much closer approximation to the original state of the animal fixed by thousands of years of natural adaptation to environment than ... [did] the comparatively recently developed specialist breeds'.¹²⁶

Written in 1936, this rhetoric interpreted the development of the breed in such a way as to legitimize sheep breeders' efforts to repurpose their colonial flocks for the British market. In the case of colonial New Zealand's trade in frozen meat, novel technologies and novel breeds were mutually reinforcing. The ability to hold flesh 'in a state of ... suspended animation'¹²⁷ brought colonial pastures into greater temporal, if not geographic, proximity with metropolitan markets. As a 'native' breed devised to fit the holds of refrigerated ocean liners, and to suit the demands of British consumers, the Corriedale was a new kind of colonial hybrid. As the product of British culture, history and biota, and the geography, environment and climate of colonial New Zealand, it was testament to the power of imperial ties to remake taste, breeds, and bodies.

¹²³ G. H. Holford, *The Corriedale: New Zealand's contribution to the sheep world* (1925), p. 11.

¹²⁴ *Ibid.*, p. 12. Alfred W. Crosby, *Ecological imperialism: The biological expansion of Europe, 900–1900*

(1986).

¹²⁵ *The Corriedale*, p. 3.

¹²⁶ *Ibid.*

¹²⁷ 'Australian meat-trade', p. 246.