

# On Breathless Cows and Mad Scientists: Exploring the Science-Nation-State Nexus

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If you are reading this you probably do not have contagious bovine pleuropneumonia (CBPP). It's just as well: if you're a cow, at least, you don't want any part of it. The first indication that you have the disease's hyperacute form, alas, is your own death. And this is the form you get if you're *lucky*. You're more likely to get the acute form, which will leave you feverish and depressed, followed by severe respiratory distress, including laboured and painful breathing — “grunting’ when exhaling, coughing, standing with the head and neck extended, dilation of the nostrils, panting, nasal discharge, and frothy saliva at the mouth...” *Then* you die.

CBPP is caused by the agent mycoides SC (small colony), a sub-species of ruminant pathogens in the *Mycoplasma mycoides* cluster. Basically, it's a bacterium that affects the lungs of cattle, buffalo, yaks and zebu; sheep, goats, camels and wild bovids are highly resistant. Acute and hyperacute forms of the disease are characterized by the presence of serofibrinous<sup>1</sup> inflammation (pneumonia) between lung tissues, high rates of fluid retention (oedema), and

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<sup>1</sup> This refers to a material that is a combination of serum and fibrin, the latter an insoluble protein integral to the coagulation of blood.

hepatization — the consolidation of healthy tissue into organ-like masses. Meanwhile, about 30% of all cases are subacute, inasmuch as the affected animal's lungs form 'sealed' lesions containing the offending bacterium. Subacute animals do not show symptoms of the disease until such time as they come under physiological stress, at which point the lesions are destabilized, rendering the animal in question both ill and contagious. As destructive as the acute and hyperacute forms may be, the subacute form is more pernicious insofar as it renders detection and containment virtually impossible.

It's hardly an enchanting way to go. All the same, many cattle 'went' precisely this way in the nineteenth century, in Eastern and Western Europe, Africa, the Middle East, and, increasingly, Great Britain. In the pages that follow, after offering an overview of the interrelated processes of change that engendered increased cattle production in 19<sup>th</sup> century Britain, I will offer some *extremely* preliminary thoughts about how we might (re)consider the importance of nineteenth century cattle disease narratives as apertures into theoretical and philosophical conundrums concerning modernity. Above all else, I wish to suggest, and eventually find meaningful empirical ways of proving, that cattle disease, and disputes related to international trade in potentially diseased cattle, provided uniquely formative models for successive paradigms in modern western diplomacy, as well as scientific knowledge creation. What is clear enough is that disputes concerning trade in diseased cattle were present at the birth of the science-nation-state nexus. Indeed, with the possible exception of war diplomacy, trade disputes of this sort furnished

the most involved, thoroughgoing nodes of international engagement, as well as conflict resolution; science was integral to both.

It is thus clear that those involved in such disputes were among the very first to grapple with, and seek ways of circumventing, the fact that putatively universal (ahistorical, transcultural) science and territorially bound, mutually exclusive nation-states are in fact deeply paradoxical institutions in what is too often taken to be a monolithic modernity. Cattle-trade disputes that pitted scientists in one nation-state directly against those in others might offer some fruitful empirical avenues for understanding the formative processes in modern-institutional development. This paper augurs with the “agrarian studies” *oeuvre* insofar as I am copping yet another plea for the value of agrarian issues for bodies of literature, and interpretive strategies, dedicated to understanding the advent of modernity. If, as one wise historian of agriculture has put it, “seed eaters have responsibilities,” then those of us who study seed (and meat) eaters are obliged to make our work resonant with that of those who do not.

Meat, (and particularly beef) was very much implicated in the process by which the world-system was reconfigured from the mid nineteenth century forward. It all started in earnest in 1842 — when the British Parliament loosened import restrictions on cattle from the Continent — and intensified more still in 1846, with Sir Robert Peel’s repeal of England’s infamous Corn Laws. A Thirty-year period of overt protection (in the form of the Corn Laws) for Britain’s landowning class gave way to an approximately ninety-year period of favour for England’s domestic food consumers.<sup>2</sup> Contrary to what opponents of repeal

feared, it did not consign British agriculture to oblivion; or, in any case, there were nuances, including an approximately twenty-year period of robustness in certain agricultural sectors.

For one thing, the timing couldn't have been better. The crushing accumulation crisis that had characterized most of the 1840s in Britain, and had at least partly engendered revolutions on the Continent in 1848, was addressed through massive investment in rail construction; England's track mileage increased by three fold from 1844 to 1849. This helped manufacturing concerns insofar as it eased the so-called "realization crisis," by circulating manufactured goods to areas where people who could afford to make purchases actually lived. But in time railroads would also affect the agricultural economy and the geography of British agriculture quite substantially.

First, though, prices for most farm products were unduly low in the period between repeal and the early 1850s. Making matters worse, a series of especially wet Autumn seasons, culminating in the worst of them all, 1852, proved very costly for farming interests already significantly weakened by low prices. The advent of hostilities in the Crimea, in 1853-'54, brought a period of relief as Britain's producers were called upon for the usual provisioning that is generally associated with war. For approximately one decade after 1855, prices for most agricultural products, while lower than during wartime, remained higher than had been the case for the late 1840s and early 1850s. Severe

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<sup>2</sup> The acknowledged end of the free trade in food era was the advent of England's Wheat Act of 1932, which imposed quotas and tariffs on foreign wheat; slight preferences were retained for "empire" wheat.

drought in 1868 and the outbreak of the Franco-Prussian war, which effectively removed France and Germany from commercial competition in agricultural stuffs, helped keep prices at remunerative levels into the early 1870s.

Then things began to change...dramatically. The much-discussed depression in British agriculture, which coincided with a massive downturn in international trade generally, set in in 1874. Reduced trade in industrial goods left British consumers unable to sustain pre-depression food-price levels, forcing difficult choices upon farmers, especially those on grain-arable lands. By this point, a period of reliance on the Black Sea grain trade contracted, as even cheaper wheat, most of it from the US, borne on dramatically cheaper transportation systems throughout the 1870s<sup>3</sup>, reached Europe in appreciable quantities. A severe, twelve-year decline began in the early 1880s as the world price of wheat plummeted very nearly by half between 1882 and 1894.<sup>4</sup> What is more, this long phase of wheat-price deflation culminated in the “panic of 1893” and, subsequently, one of the most severe economic depressions of the nineteenth century, both in the US and Britain.

Speaking in general terms, British cultivation over the period between 1846 and the early 1870s was based in large measure (not everywhere, and not even homogeneously so even within given districts) on the wage relation, modeled to some extent along lines similar to industry. Many with large land

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<sup>3</sup> Ocean freight rates declined by two-thirds from 1870 to 1890: see Helen Farnsworth, "Decline and Recovery of Wheat Prices in the 'Nineties," *Wheat Studies of the Food Research Institute* 10, 8 and 9 (Stanford: Stanford Food Research Institute, June and July 1934): 289-344.

<sup>4</sup> John Kirkland, *Three Centuries of Prices of Wheat, Flour and Bread* (London: National Bakery School, Borough Polytechnic Institute, 1917), 35.

holdings, Sir Robert Peel among them, did what they could to reorganize and renegotiate tenant agreements and/or offered investment incentives for labour inputs aimed at production improvements — implement acquisitions, off-farm input purchases, and drainage schemes. Peel apparently argued, indeed hoped, that the effects of his own policy of repeal could and would be offset by cheaper transport costs and improved farming practices.

However, by the period of total collapse (beginning in 1874), deflated prices began to throw the entire system of wage-based grain production into complete doubt. From that point, the world's most industrialized jurisdiction, Great Britain, turned to a range of socially distinct strategies for acquiring what Harriett Friedmann calls its "wage foods" — cheap foodstuffs for use by industrial wage labourers. In one case, especially the tropics and the US South, systems of tenant farming replaced slave based, plantation-style production for a range of basic goods. In the other, more dramatic instance, temperate latitude colonies such as Canada, as well as large tracts of independent nation states such as the US, hosted free-hold tenure opportunities.

Generally speaking the key to this transition to production in temperate regions was, on one hand, the opening of new lands to arable use and, on the other, the export, from Great Britain and elsewhere in Europe, of capital and people. The numbers are staggering on all accounts. As historian Eric Hobsbawm reveals in his work on the growth and consolidation of capital, world crop cultivation expanded by some 50 percent in the four decades between 1840 and 1880. Canada and Australia accounted for half of this growth.<sup>5</sup> As for

the movement of labour and capital, the numbers are truly impressive. Overall, for the period between 1820 and 1930, intercontinental migration is recorded at sixty-two million people.<sup>6</sup> Most of this migration took place in the half-century leading up to WWI; most targeted five main countries: the USA received 61.4 percent; Canada absorbed 11.5 percent; Argentina took 10.1 percent; Australia 4.5 percent; and New Zealand 3 percent.<sup>7</sup> Meanwhile, not surprisingly, the British Isles contributed the lion's share of emigrants over this same period.<sup>8</sup>

Capital moved about as well. According to economic historian William Ashworth, the high-water mark of capital movement was the fifty or sixty years before the First World War. Here again, Britain led the way, as its total prewar investments soared to four billion pounds sterling.<sup>9</sup> While the destinations of British capital varied with time, by the end of 1913 some 47 percent of all British foreign investment was within the British Empire. Canada enjoyed the largest share of this capital outflow by a considerable margin. From 1870 to 1914, the prime target of British foreign capital was railroad construction. Indeed, some 40 percent of all British capital had flowed to railroad production by the onset of the First World War.<sup>10</sup>

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<sup>5</sup> Eric Hobsbawm, *The Age of Capital* (New York: Scribner, 1975), 179.

<sup>6</sup> William Ashworth, *A Short History of the International Economy since 1850*, 4th ed. (London: Longman, 1987), 196-197.

<sup>7</sup> *Ibid.*, 197.

<sup>8</sup> For a useful (if dated) overview of international migrations see Imre Ferenczi, *International Migrations, I* (New York: National Bureau of Economic Research, 1929) and Aaron Segal, *An Atlas of International Migrations* (London; New York: Hans Zell Publishers, 1993).

<sup>9</sup> Ashworth, *A Short History of the International Economy Since 1850*, 206.

<sup>10</sup> *Ibid.*, 206-209.

And so, two main capital-related ventures underpinned the opening of North America's Interior Plains. Manufacturing and commercial capitalists sought wage-foods while potential lenders, especially those seeking investment vehicles for their liquid capital, ferreted out safe foreign investment opportunities. Though these interests could be and at times were contradictory, their best mutual prospects for success shared one major requirement: the advent of freehold tenure and non-waged relations most closely associated with wheat production was most likely.<sup>11</sup> That is, if the goal of extensive wheat production outside Great Britain for the sake of wage-foods was to escape the cycle of high labour costs and, subsequently, reduced profits in manufacturing, there was little 'sense' in organizing wheat production along strictly capitalist lines. This was especially so since the great abundance of land controlled by newly-consolidated national polities such as Canada posed the related risks of labour scarcity and high wage costs. When agricultural production based on the wage relation, such as prevailed in Britain between 1846 and 1870, encountered difficulties, landlords could reduce labour costs — though such a

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<sup>11</sup> It must be acknowledged that Argentina represented a striking exception to this pattern. There, wheat production engaged in an ongoing battle with large, capitalist animal-grazing concerns. Wheat production was similarly undertaken on large, predominantly single-owner estates. This pattern evolved for a variety of complex environmental, social and economic reasons; its consequences are the subject of much debate. See James Scobie, *Revolution on the Pampas: A Social History of Argentine Wheat, 1860-1910* (Austin: University of Texas Press, 1964); Carl Solberg, *The Prairies and the Pampas: Agrarian Policy in Canada and Argentina, 1880-1930* (Stanford: Stanford University Press, 1987); Jeremy Adelman, *Frontier Development: Land, Labour, and Capital on the Wheatlands of Argentina and Canada, 1890-1914* (Oxford: Oxford University Press, 1994) and Adrián Gustavo Zarrilli, "Capitalism, Ecology, and Agrarian Expansion in the Pampean Region, 1890-1950," *Environmental History* 6, 4 (October 2001): 561-583.



strategy would have deleterious effects on industrial production by applying downward pressure on wages in general, thus forestalling 'popular' consumption of industrially produced goods. So-called "family farming" based on freehold plots allowed for different strategies. It made possible a greater degree of 'flexibility' in personal consumption. Or, if one prefers Wilfred Malenbaum's more austere terms, "low initial returns to the settler could be absorbed in privation and suffering."<sup>12</sup> This was not, of course, good news to individual producers, but it did fend off decomposition of the basic production unit, the "family farm," and help sustain the capital ventures enumerated above.

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Abundant land also promised (for a while) lower levels of productive consumption inasmuch as naturally-occurring fertile land remained in abundance. Off-farm inputs such as fertilizer were for the most part unnecessary in Canada as any chronic yield declines could be offset by increasing production on the extensive (read, fertile) margins. This so-called "soil mining" continued apace well into the twentieth century before industrially-produced fertilizers became a significant factor of production.<sup>14</sup>

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<sup>12</sup>Wilfred Malenbaum, *The World Wheat Economy, 1885-1939* (Cambridge, Mass.: Harvard University Press, 1953), 130.

<sup>13</sup> The term, and concept, of "decomposition" as used here relates to a long-running debate over the role and status of family farming within a capitalist mode of production. Harriet Friedmann's work is an important intervention on the debate. Friedmann charts a course between those of a classical Marxist ilk who, while recognizing the recalcitrance of petty commodity production to become fully proletarian, nevertheless believe that all agricultural activity will eventually "decompose" into industrial-style relations of production, and those inspired by A. V. Chayanov's classic formulation of Russian peasantry. For examples of the former see especially the Banaji entry in F. H. Buttell and H. Newby, eds., *The Rural Sociology of Advanced Societies* (Montclair, N.J.: Allenheld, Osmun and Company, 1980): 39-82. For Chayanov see A. V. Chayanov, *On the Theory of the Russian Peasantry*, ed. D. Thorner and et al (Homewood, Illinois: American Economic Association, 1966).

It must be acknowledged that production on North America's interior plains was slow to respond to Britain's changing agricultural circumstances. In the American case, once appreciable settlement reached the trans-Mississippi region circa the 1840s, it skipped the plains for some three decades, in spite of the Republic's enactment of its 1841 Preemption Act and, for a while, its 1862 Homestead Act.<sup>15</sup> The case was similar — if more delayed — for Canada, where some 82 percent of wheat acreage was still situated in Ontario as of 1881.<sup>16</sup> As late as 1871, England still looked to Russia for 42 percent of its total wheat imports.

Nevertheless, the writing was on the wall as this "give-and-take" process advanced slowly. Although wages in general did not advance through much of the depression, **real** wage levels (for industrial workers) did rise, *by definition*, due to the fall in agricultural prices. A corresponding decrease in land values, disproportionately severe in wheat-growing areas, sent landowners scurrying for new crop and livestock opportunities; or, conversely, hurrying to sell their increasingly devalued asset, the land itself.<sup>17</sup>

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<sup>14</sup> Fertilizer expenses do not appear in Dominion Bureau of Statistics tables until 1926. For that particular year, total expenditures on fertilizer for Canada as a whole were approximately six million dollars: Historical Statistics of Canada, "Table M523-524," (accessed January 2004); available from <http://www.statcan.ca/english/freepub/11-516-XIE/sectiona/toc.htm>.

<sup>15</sup> Histories of American agriculture are legion. A dated but still useful overview is offered by Willard Cochrane, *The Development of American Agriculture: An Historical Analysis*, 2nd ed. (Minneapolis: University of Minnesota Press, 1993).

<sup>16</sup> The 82 percent figure is taken from William L. Marr, "The Wheat Economy in Reverse: Ontario's Wheat Production, 1887-1917," *Canadian Journal of Economics* 14, 1 (February 1981): 136-145. The second figure is drawn from Malenbaum, *The World Wheat Economy*, 236.

In all, without simplifying over much, changes in British trade policy and domestic agricultural practice engendered massive changes in regional specialization, as well as the advent of an entirely novel social basis (free-hold tenure) for the provisioning of cheap staple foods to the world's "workshop," Britain. As Harriett Friedmann points out, this period of intense reorganization defined the world-system's centre and semi-periphery zones and pretty much ensured that the agrarian roots of the modern world-system would endure well in (and through) the 20<sup>th</sup> century.

Beef was present at, and integral to, the birth of this reordered world-system. It was the other side of the push-pull process that drew grain production away from Great Britain and organized it along entirely novel productive lines in temperate areas. Simply put, meat grew in importance relative to wheat, both in Britons' diets, and in terms of the agricultural geography of Britain. The number of cattle imported to England rose from some 4,264 in 1842 to 45,043 in 1846. By 1853 some 125,253 head of cattle entered England, an astonishing thirty-five-fold increase in eleven years.

Of course, rail expansion effected major changes in the agricultural geography of Britain. To be sure, slightly more localized markets for fattened cattle emerged in areas now capable (thanks to relatively cheap transport) of sustaining integrated markets in the inputs and by-products of livestock production. And the explicit cost of rail transport was offset by the avoidance of

certain implicit costs. For instance, the once-common practice of driving

<sup>17</sup> W.J. Lauck, *The Causes of the Panic of 1893* (New York: Houghton Mifflin Co., 1907) and Charles Hoffman, "The Depression of the 1890s," *The Journal of Economic History* 16, 2 (June 1956): 137-164.

(herding cattle long distances to market) uniformly resulted in significant weight loss (of the cattle), which rail transit reduced substantially. Moreover, enclosure and (relatedly) fence construction eliminated the availability of in-transit feeding and watering opportunities, again, rendering the droving process too costly.

While it is true that, according to historian Richard Perren, reasonably significant quantities of dead meat entered the British market between 1842 and 1865, this trade was limited by semi-inadequate preservation techniques, preferences for freshness, and rather widespread concerns over food adulteration. Besides, live cattle were perfectly suited to newly capitalized railroad concerns to the extent that the cattle *loaded themselves* onto rail cars, thus permitting savings on costly labour and/or technology inputs.

Increased trade in cattle, especially live cattle, amounted to a de facto increase in trade of the diseases they carry. This came true with a vengeance by the early to mid 1860s, as losses from cattle disease stood around twenty million pounds sterling. The most dramatic losses prior to 1872 were from pleuropneumonia, which afflicted approximately one million cattle, amounting to some twelve million pounds sterling, between 1855 and 1860. Given the obvious circumstantial connection between trade and disease transmission, many contemporaries wrote as if trade *created* certain pathogens. In any case, the two were linked at a much deeper level than we tend to imagine today. Certainly trade was recognized by US Secretary of the Treasury, Charles Folger, as a 'modern' means of disease transmittal that differed in kind and degree of complexity from its predecessor, war. He wrote: "during the last half

century the increasing activity of the cattle trade has taken the place of wars in the general diffusion of this plague.” By the early 1860s something of a threshold had been crossed, enough so that serious responses to disease abatement were being contemplated at the highest levels of British government. It took the indefatigable efforts of Professor John Gamgee to alert public attention to the ravages of cattle disease, pleuropneumonia in particular, but by 1866 contagious disease measures were in place.

But not only did liberalized trade of the mid and late nineteenth century create the structural basis for disease transmittal, it provided tacit parameters according to which science-based negotiation of disputes would proceed. The novel and fast-moving changes in international economy, centered in large measure on the wheat-meat complex of Britain, were thus part and parcel of giving post-enlightenment science its most distinguishing (as distinct from pre-enlightenment science) feature: increasing immersion within territorially fixed, mutually exclusive, and, most critically, mutually competitive nation states.

Science had a new place to be. A significant and growing literature has emerged around the search for “geographies of scientific knowledge.” David Livingston’s thin but important volume, *Putting Science in its Place*, is perhaps the strongest recent statement concerning the importance of ‘place’ in the creation and consumption of scientific knowledge. Livingston visits not only the ‘typical’ sites of knowledge creation — laboratories, botanical gardens, and so forth), but also less typical ones, such as coffeehouses, ship decks, and asylums. He moves somewhat seamlessly, though not unproblematically,

toward a regional perspective, and elucidates deep connections between discreet 'places' (ship decks) and regional identities, which are always and forever bound up in knowledge creation, and vice-versa.

One detects at least an elective affinity between Livingston's connections and those of actor-network theory (ANT), introduced by Bruno Latour, John Law and Michel Callon in a series of publications between 1986 and 1987.<sup>18</sup> This approach asserts that humans align themselves not only with other humans, as <sup>18</sup> Three publications are associated with the advent of ANT: Michel Callon, "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay," in *Power, Action and Belief: A New Sociology of Knowledge*, ed. John Law (London: Routledge, 1986); John Law's assessment of "heterogenous engineering" in 16<sup>th</sup> century Portuguese expansion, John Law, "Technology and Heterogenous Engineering: The Case of Portuguese Expansion," in *The Social Construction of Technological Systems New Directions in the Sociology and History of Technology*, ed. Bijker Wiebe, Thomas P. Hughes, and Trevor J. Pinch (Cambridge, Mass: MIT Press, 1987). There were however very definite hints of the perspective in Latour and Callon's 1981 assessment of social power and of sociologists' propensity for a *priori* judgments about the size and nature of actors in power networks. They write, "we cannot analyze the Leviathan if we give precedence to a certain type of association, for example associations of men with men, iron with iron, neurons with neurons, or a specific size of factors": Michael Callon and Bruno Latour, "Unscrewing the Big Leviathan: How Actors Macro-Structure Reality and How Sociologists Help Them Do So," in *Advances in Social Theory: Towards*

the social constructivists suggest, but also with material objects, and materials in general, in order to build alliances over the nature and shape of both knowledge and technological artifacts. Material objects and humans alike are thus cast as “actants” in the struggle to define, assert and extend knowledge. The implicit connection between Livingston’s work and ANT is the notion that there is no “action at a distance” where knowledge is concerned; scientific truths ossify outward from a core via cultural, intellectual, and material connections.

Compelling and crucial as the “putting science in its place” paradigm is for alerting us to the spatial fixity and/or contingency of scientific knowledge, there are significant ways in which cattle-disease disputes might add nuance to literature on knowledge creation specifically, and the paradoxes of modernity more general. Livingston reads developments in knowledge *a posteriori* in an effort to find their ‘place’ — again, a worthwhile undertaking in its own way, However, what makes scientific knowledge of cattle disease uniquely interesting is the simultaneous creation, not only of science *per se* in a place, but of an entirely new (historically speaking) ‘place’ itself: the nation-state. As I have suggested above, the crisis of capitalism centered on Great Britain in the 1840s was addressed through a series of measures that, to a considerable extent, *engendered* the necessary advent of nation-states as we now know them. Cattle were present at and integral to this process.

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*an Integration of Micro and Macro-Sociologies*, ed. Karin Knorr-cetina and A.V. Cicourel (Boston, London and Henley: Routledge & Kegan Paul, 1981), 292.

As for the nation-state itself, much has been made of this tendentiously anomalous (even contradictory) form of social and political organization. Although it might *seem* as if, from the outset, industrial capitalism required larger, more centralized jurisdictional forms, the so-called “state system,” as Immanuel Wallerstein terms it, established an apparently necessary competitive sensibility in world trade — mirroring the competition that is supposed to operate between utility-maximizing individuals. Moreover, the multi-state system insured that no *one* state could introduce measures not favourable to capitalist strategies of accumulation — at least not to a degree that the entire system collapsed.

As surely as not, the advent of territorially bound states, relatively limited in physical extent and jurisdictional reach, influenced both the metaphors as well as the actual practices governing certain forms of scientific inquiry. Eric Worbys touched on issues related to the complexity of science emanating from mutually self-interested states in an article, “Germ Theories of Disease and British Veterinary Medicine, 1860-1890.”<sup>19</sup> There, Worbys explains why fundamental work, at the cellular level, in experimental pathology and germ disease was not pursued by mid-century British veterinary scientists:

...veterinary theory and practice was dominated not by germ theories of disease but by importation theories of disease. The preferred approach to the control of major livestock diseases was to keep such diseases out of the country and, when that failed, to stamp them out by restricting livestock movements and by slaughtering. Thus, in the last third of the nineteenth century, while medicine looked to science for greater understanding and control of

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<sup>19</sup> *Medical History*, 35:3 (1991: July).



diseases...veterinary medicine looked to the state for the same objectives.<sup>20</sup>

In other words, British veterinary scientists organized their approach to scientific inquiry (at least concerning germ theories of cattle plague) on the level of the “national herd.” Whether this was a conscious choice or not, it can scarcely come as a surprise that this model *might* emerge, given the centrality of cattle to the changing basis of British agriculture in particular, and to British industry more generally in an evolving inter-state system.

Perusing documents related to pleuropneumonia disputes, one discerns several other themes elicited by the nation-state-science nexus. First, luminaries in early cattle disputes had to account for the deep ambivalence inherent in nation-state-based science, at once acknowledging the legitimacy of individual states’ self-interest *while* gesturing at the putatively universal nature of truth, research, and scientific findings. This gave rise to the need for a breed of what I will call ‘absolutism’ that otherwise did not necessarily prevail in mid-nineteenth century communication of scientific facts.<sup>21</sup> A letter from the US Secretary of the Treasury, dealing with Britain’s initial decision to ‘schedule’ (place import restrictions on) American beef in 1879, made the point unequivocally: “It is vain to hope that England will remove this restriction so

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<sup>20</sup> Ibid., 309

<sup>21</sup> Lorraine Daston and Peter Galison have worked extensively on the historical contingency. Summarily, they offer a definition of objectivity as being the absence of subjectivity. The individual — potentially capricious, improvident, self-interested, etc — is replaced by devices, such as photography, that offer *mechanical objectivity*. See their article, “The Image of Objectivity” in *Representations*, 40, 1992; their forthcoming book, *Objectivity*, promises a much more fine-grained assessment of the topic.

long as we fail to show that the last vestige of the infection has been wiped out from our land.” The letter goes on to point out that “nothing short of the absolute and undeniable extinction of this disease in the United States will reopen the British market to our live cattle.”

This is a surprisingly demanding expectation that a US official has foisted on his own jurisdiction. One might expect such an official to place at least partial hopes on nuance, subtlety, even diplomatic rhetoric, to convince British authorities to lift import restrictions. But in the case of trade disputes there is relatively little time for such strategies, as the offended country holds the ultimate potential to find other sources for a given item, in this case beef. Being convincing is important, but so too, in this context, is being strategic.

We have got to ask: how is it that the nation-state and science coexist so relatively well, despite being at fundamental odds in some very critical senses? I suspect that at least part of the answer to this lies in the details of nineteenth century international disputes over cattle disease. These were among the first, and certainly among the most important, instances in which these two opposing institutions clashed. Rather than assuming that scientists worked these matters out in slow, incremental research steps, in search of the truth, it's best to attend to the issue from another angle: these were formative years for the nation-state-science nexus. It's likely, entirely possible, in fact, that the language used to obscure this paradox ever since was born in the first, perhaps most significant, dispute to pit the two against each other.