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Cattle and colonialism: an animal-centred history of southern Africa, 1652-1980s

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Chapter Three: Lungsickness, rinderpest, East Coast fever: eroded transhumance, veterinary expansion, and cattle as biomedical subjects, 1853–1920s

> I have always advocated the immediate slaughter of an infected herd.[1] – Duncan Hutcheon

> They tell me you are a doctor, and that you are a great doctor, but can you do nothing but kill?[2] – Bechuanaland Chief Molala

> If all the cattle are shot, there will be an end to Rinderpest, of course, but an end of the cattle too! The disease can go no further…and does not go so far for two to ten per cent of the cattle attacked survive and surely in such a case ten or even two live cows are better than a hundred killed.[3] – Farmer

[1] D. Hutcheon, *Report of the Colonial Veterinary Surgeon for the Year 1902* (Cape Town: Cape of Good Hope Department of Agriculture, 1903), 8.
[2] D. Hutcheon, *Special Report on Rinderpest in South Africa, from March, 1896, to February, 1897* (Kimberley, 1897), 27.
[3] D. Gilfoyle, 'Veterinary Research and the African Rinderpest Epizootic: The Cape Colony, 1896-1898', *Journal of Southern African Studies* 29, 1 (2003), 136.

Introduction

There are four primary ways to respond to an epidemic that afflicts humans. Quarantine the infected, treat the infected, vaccinate the uninfected, and/or achieve herd immunity. When epidemics afflict animal populations a fifth option is pursued; kill the infected. What is remarkable about the colonial approach to the three major cattle epidemics in nineteenth and early twentieth century southern Africa is the swift readiness of state veterinary officials to recommend the fifth option. These wide-reaching cattle massacre programmes were euphemistically termed 'culling' or the 'stamping out' approach.[4] A slaughter-all those infected or presumed-infected approach was a core feature of Britain's response to rinderpest in the mid-nineteenth century. In all three diseases analysed, Britain's rinderpest approach was at one point copy-pasted onto colonial southern Africa.

By positioning cattle at the centre of analysis, I investigate three cattle diseases that altered the course of cattle history in southern Africa. These epidemics are Lungsickness, rinderpest, and East Coast fever. Centring cattle in the historical analysis is an obvious move because cattle were clearly at the centre of these epidemics. But, remarkably, as the historiographical discussions illustrate, historians have not yet imagined or pursued in a sustained way the primary question of what these epidemics meant *for cattle*. Exploring what these epidemics meant for cattle – at the individual- and group-levels – is the primary, distinguishing contribution of this chapter.

Gary Marquart has noted that historians writing about rinderpest have not paid attention to the nature of the disease, its epidemiology, in analysing its human impact in southern Africa.[5] He drew inspiration from Michael Pollen's *The Botany of Desire: A Plant's-Eye View of the World* (2001) and James Scott's *Seeing like a State* (1998) – to *see like rinderpest*. Focusing on Bechuanaland as then emblematic of the region, Gary Marquart's approach offered new insights into why and how the disease spread in the southern African context. I note that no historians have paid attention to cattle as sensate living subjects in studying rinderpest,

[4] Hutcheon, *Special Report on Rinderpest in South Africa, from March, 1896, to February, 1897*, 27–28.
[5] G. Marquardt, 'Building a Perfect Pest: Environment, People, Conflict and the Creation of a Rinderpest Epizootic in Southern Africa', *Journal of Southern African Studies* 43, 2 (2017), 349–63.

Lungsickness, and East Coast fever, and offer no sense that they have much knowledge of cattle as feeling, experiential beings. Following but extending Gary Marquart's innovation, I explore three major epidemics by seeing and feeling like cattle. This chapter offers a reinterpretation of these epidemics by shifting the focus onto cattle and their experiences of the diseases, in particular the diseases' impacts on them at the individual- and group-levels. At the group-level, cattle's movements were restricted by fencing and quarantine operations, they increasingly became subjects of biomedical experiments, the agricultural departments, sometimes backed by the police and military, came to exert ever more control over them, they succumbed in great numbers to the three diseases, and they were repeatedly subject to cattle massacre projects. At the individual-level, cattle faced the threat of nascent colonial states wanting to slaughter them, they individually suffered and perished from the different epidemics' diseases courses, and they lost kin and companions to the disease. This chapter innovates in that it shifts to an animal perspective to reinterpret the epidemics – it opts out of the orthodox humanist paradigm that characterises almost all historical scholarship. It is not focused on the impacts of the diseases on humans.

In the past two decades, 'an "emotional turn" in the study of history has been unfolding'.[6] There has been an increase in scholarship exploring histories of emotions, including histories which recognise emotions as legitimate avenues for historical investigations of imperialism.[7] There are also histories of pain and emotions, some of which have started to explore animals' historical emotions and pain.[8] This investigation is pursued in the vein of attempts to recognise animals' emotions and pain, and present these as legitimate historical experiences.

On one level, this chapter bears witness to the effects epidemics had on cattle. Whereas previous scholarship has near-exclusively analysed rinderpest in single colonial nation states

[6] J. Lewis, 'Emotional Rescue: The Emotional Turn in the Study of History', *Journal of Interdisciplinary History* 51, 1 (2020), 122.
[7] W. Reddy, *The Navigation of Feeling: A Framework for the History of Emotions* (Cambridge: Cambridge University Press, 2001); J. Plamper, translated by K. Tribe, *The History of Emotions: An Introduction* (Oxford: Oxford University Press, 2015); R. Boddice, *The History of Emotions* (Manchester: Manchester University Press, 2018); J. Lewis, *Empire of Sentiment: The Death of David Livingstone and the Myth of Victorian Imperialism* (Cambridge: Cambridge University Press, 2018); F. Alberti, *A Biography of Loneliness: The History of an Emotion* (Oxford: Oxford University Press, 2019).
[8] R. Boddice (ed.), *Pain and Emotion in Modern History* (New York: Springer, 2014); L. Gray, 'Body, Mind and Madness: Pain in Animals in Nineteenth-Century Comparative Psychology', in R. Boddice (ed.), *Pain and Emotion in Modern History* (New York: Palgrave Macmillan, 2014), 148–63.

or protectorates, I take a regional approach, arranging secondary and some unused primary materials to offer a regional cattle-centred view of rinderpest. A regional approach connects discrete national or local scholarship and indicates similarities, differences, and connections across the region. It enables a wider, broader view of how disease epidemics impacted cattle history.

I pose two broad questions. How were individual cattle impacted by the epidemics, and how were cattle as groups affected? There is thus an interest in the symptoms and disease course cattle endured and the responses of states, farmers, and cattle-keepers. Exploring answers to these questions offers an account of how these epidemics altered the course of cattle history in southern Africa from the mid-nineteenth and early twentieth centuries. Chronologically, the chapter starts with the importation of Lungsickness, *bovine pleuropneumonia*, into the Cape Colony in 1853 and ends by examining the spread and impact of East Coast fever in Rhodesia and the Transvaal from 1901 until the emergence of a widespread cattle dipping regime in 1910.

Lungsickness in the Cape and pre-colonial Namibia, 1853–1904

Lungsickness was a calamity for cattle in southern Africa. The disease was highly contagious and its asymptomatic transmission period was long and varied. Lungsickness, or contagious bovine pleuropneumonia afflicts cattle's lungs and renders them unable to breathe and later unable to eat. The disease was imported to the Cape via a bull on a Dutch ship in 1853, as discussed further below.[9] Lungsickness travelled from Cape Town to the present-day Eastern Cape and also across the Orange River into present-day Namibia. It was principally transmitted via oxen performing long distance wagon transport labour, and because farms were unfenced, and cattle shared pasturage and drinking sites.[10] By late 1855 it had killed about 100 000 cattle or 20% of the cattle population in the interior of the colony.[11]

[9] C. Andreas, 'Preventative Inoculation of Cattle against Lungsickness in the Cape: Informal Technology Transfer and Local Knowledge Production in the Nineteenth Century', *South African Historical Journal* 71, 4 (2019), 537.
[10] *Ibid*, 537–38.
[11] *Ibid*, 538.

Stopping its infection trajectory required quarantine and medical interventions. In the Cape a vigorous inoculation programme learned by farmers and cattle-keepers via colonial newspapers saw Lungsickness greatly diminished by the late 1850s. These methods were transferred north to what became Namibia, where they were adapted and adopted. In this way, cattle from the mid-nineteenth century started to become subjects of live, crude, trial-and-error biomedical experiments. What this meant for cattle experiences is the focus of this section.

Lungsickness-positive bulls from Rotterdam arrived in Cape Town on the Dutch ship *Princess Marianne* on 24 March 1853.[12] Since Lungsickness was new to southern Africa, cattle had developed no immune response to it. On occasion suggesting a recognition that the afflicted cattle had feelings and experiences, a Cape Colony government gazette in November 1853 described *long-ziekte* or Lungsickness symptoms in the following terms. Cattle succumbed to 'continuous coughing', 'irregularly' beating hearts, and were 'dejected'. They lost their appetites, and a 'gluey fluid' ran from their eyes. Their legs and ears became cold. Their mouths and noses 'discharge[d] a pituitous (slimy) matter'. The final course of the disease, it noted, 'is the most dangerous, and…incurable'.[13] Cattle, it said, 'become extremely weak, tumble in walking on, get short breathed (asthmatic), and the belly beats.' The 'beatings of the heart become more and more sudden and more irregular, until the cattle die'.[14]

A small body of historical scholarship has examined the Lungsickness epidemic that afflicted southern Africa in the mid-nineteenth century.[15] A far larger body has examined the cattle massacre that occurred in 1857, in which 400 000 cattle were slaughtered. The massacre generated a lively and varied scholarship. A range of scholars deepened Jeff Peires' reading

[12] Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 537.
[13] Cape of Good Hope Government, 'Gazette, 17 November' (Cape of Good Hope, 1853), 2.
[14] *Ibid*.
[15] H. Schneider, 'The History of Veterinary Medicine in Namibia', *Journal of the South African Veterinary Association* 83, 1 (2012), 1–3; C. Andreas, 'The Spread and Impact of the Lungsickness Epizootic of 1853–57 in the Cape Colony and the Xhosa Chiefdoms', *South African Historical Journal* 53, 1 (2005), 50–72; Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 2019; N. Madida, 'A History of the Colonial Bacteriological Institute 1891-1905' (Master's Thesis, University of Cape Town, Cape Town, 2003); W. Beinart, 'Transhumance, Animal Diseases and Environment in the Cape, South Africa', *South African Historical Journal* 58, 1 (2007), 32, 35, 39; J. Lewis, 'An Economic History of the Ciskei, 1848-1900' (PhD Dissertation, University of Cape Town, Cape Town, 1984), 139, 217, 218, 222, 225, 230, 266, 278.

of the 'cattle killing'.[16] Timothy Stapleton read the cattle massacre as a revolt against 'impotent royals and aristocrats' in a context of diminishing and fragmented chiefly power.[17] G.T Sirayi emphasised a literary and aesthetic interpretation of the cattle massacre in Xhosa culture.[18] Julian Cobbing regarded the halted agriculture and ecological distress as under-emphasised, while Jack Lewis argued for a materialist interpretation of the massacre.[19] Adam Ashforth promoted a post-modernist reading and, suggesting that victors write history, warned against 'translating the colonized people's experience into the terms of dominant discourses'.[20] Helen Bradford argued for a gender-sensitive lens when writing Xhosa history.[21] Andrew Offenburger drew on a Midwestern American film *Field of Dreams* to offer parallels between a millenarianism of Iowa farmers and Xhosa cattle-keepers.[22] The cattle massacre remains a fascinating and transformative episode in the expansion of settler colonialism and is important in Xhosa literature, history, and culture. But the link between Lungsickness and the massacre has more recently faced scrutiny.[23] The rich scholarship about the Xhosa cattle massacre connects interestingly with the dearth of scholarly engagement with the standard and repeated cattle massacre policies of colonial states in the region.

No one has examined the emergence and spread of Lungsickness in the now Eastern Cape of South Africa as minutely as Chris Andreas.[24] Chris Andreas homed in on the development of inoculation methods which eventually saw the epidemic much lessened by 1859.[25] Scholars

[16] J. Peires, *The Dead Will Arise: Nongqawuse and the Great Xhosa Cattle-Killing Movement of 1856-7* (Cape Town: Jonathan Ball, 1981).
[17] T. Stapleton, '"They No Longer Care for Their Chiefs": Another Look at the Xhosa Cattle-Killing of 1856-1857', *The International Journal of African Historical Studies* 24, 2 (1991), 385–86.
[18] G. Sirayi, 'The African Perspective of the 1856/1857 Cattle-Killing Movement', *South African Journal of African Languages* 11, 1 (1991), 40–45.
[19] J. Lewis, 'Materialism and Idealism in the Historiography of the Xhosa Cattle-Killing Movement 1856–7', *South African Historical Journal* 25, 1 (1991), 244–68; J. Cobbing, 'Book Review: J. B. Peires, The Dead Will Arise, Nongqawuse and the Great Xhosa Cattle-Killing Movement of 1856–57 (Johannesburg: Ravan Press, 1989)', *Journal of Southern African Studies* 20, 2 (1994), 339–41.
[20] A. Ashforth, 'The Xhosa Cattle Killing and the Politics of Memory', *Sociological Forum* 6, 3 (1991), 590.
[21] H. Bradford, 'Women, Gender and Colonialism: Rethinking the History of the British Cape Colony and Its Frontier Zones, c. 1806-70', *Journal of African History* 37, 3 (1996), 351–70.
[22] A. Offenburger, 'Millenarianism in Iowa and the Eastern Cape: Thinking through Field of Dreams and the Xhosa Cattle-Killing Movement', *English Studies in Africa* 61, 1 (2018), 27–39.
[23] Andreas, 'The Spread and Impact of the Lungsickness Epizootic of 1853–57', 51, 56, 58; Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 539.
[24] Andreas, 'The Spread and Impact of the Lungsickness Epizootic of 1853–57'.
[25] Andreas, 'Preventative Inoculation of Cattle against Lungsickness.' C. Andreas, `The Discussion of the Nature and Prophylaxis of Lungsickness in the Cape Colony during the Epizootic of 1853-57', in J. Schäffer and P.

have noted Lungsickness' effect on political and economic systems in Namibia, although Lungsickness has not been analysed from a cattle perspective.[26] This historical analysis is focused on Lungsickness, in terms of its individual-and group-level impacts on cattle in the Cape and Namibia.

Lungsickness is caused by bacteria called *Mycoplasma mycoides*, which are pathogenic to cattle and sometimes water buffaloes.[27] To infect new hosts, the bacteria require direct transmission, which happens when Lungsickness-positive cattle cough or exhale droplets in close proximity to other cattle.[28] The incubation period is extremely long. Cattle can transmit Lungsickness for between 20 days and three months, and be asymptomatic for up to eight weeks.[29] This made the disease insidious and difficult to quarantine. Dispersed cattle grazing in large herds, as well as wagon-pulling cattle, could cover great distances and asymptomatically infect many cattle. Lungsickness harms the primary organs of cattle's respiratory system, cattle's lungs and lung tissues.[30] Straw-coloured fluids and clotted blood appear in their thoraxes, and their lungs harden.[31] Lesions occur as lung tissues die.[32] The bacteria also cause joint fluids to thicken and cattle's hips, legs, and knees can begin to swell.[33] Lungsickness has a mortality rate of up to 50%.[34] Each infected cattle suffered a variation of the above, each Lungsickness-positive cattle experienced a private, internally felt disease course.

Koolmees (eds.), *History of Veterinary Medicine and Agriculture: Proceedings of the 33rd International Congress on the History of Veterinary Medicine in Wittenberg 2002* (Giessen, 2003), 43–57.

[26] J-B. Gewald, *Herero Heroes: A Socio-Political History of the Herero of Namibia, 1890 - 1923* (Oxford: James Currey, 1999), 26.

[27] W. Amanfu, 'Contagious Bovine Pleuropneumonia', in M. Kardjadj, A. Diallo, and R. Lancelot (eds.), *Transboundary Animal Diseases in Sahelian Africa and Connected Regions* (Cham: Springer, 2019), 423. W. Amanfu, 'Contagious Bovine Pleuropneumonia (Lungsickness) in Africa', *Onderstepoort Journal of Veterinary Research* 76, 1 (2009), 13.

[28] OIE, 'Contagious Bovine Pleuropneumonia', *OIE, World Organisation for Animal Health*, 2020, https://www.oie.int/en/disease/contagious-bovine-pleuropneumonia/, accessed 12 May 2021.

[29] OIE, 'Technical Disease Card: Contagious Bovine Pleuropneumonia', *OIE, World Organisation for Animal Health*, 2020, https://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/CONTAGIOUS_BOVINE_PLEUROPNEUMONIA.pdf , accessed 12 May 20201.

[30] *Ibid*.

[31] CABI, 'Contagious Bovine Pleuropneumonia', *CABI*, 2020, https://www.cabi.org/isc/datasheet/88090, accessed 12 May 2021, accessed 12 May 2021.

[32] *Ibid*.

[33] *Ibid*.

[34] OIE, 'Contagious Bovine Pleuropneumonia', 2020.

Image 3.1. Lungsickness-positive cattle stands with extended leg postures

Source: W. Amanfu, 'Contagious Bovine Pleuropneumonia (Lungsickness) in Africa', *Onderstepoort Journal of Veterinary Research* 76, 1 (2009), 15.

A contemporary account by the missionary Daniel Lindley noted that the disease 'so long known in Holland', was able to spread rapidly for three reasons. First was a lack of enclosures and fencing, second because cattle spread over the whole country and were 'grazing by the thousand'. Third, because, by 'custom', wagons pulled by oxen, often in teams of twelve, were the main transport mode.[35] Goods and people were freighted by bulls to and from the interior and Cape Town. As Chris Andreas put it: '[o]vernight kraaling, shared pastures and watering, and the frequent straying of cattle between different, then generally unfenced farms

[35] Cattle Commission, US Department of Agriculture, *Report of the Treasury Cattle Commission on the Lung Plague of Cattle, or Contagious Bovine Pleuro-Pneumonia*, 1882, 14.

provided infinite opportunities for infection'.[36] Chris Andreas argued that the epizootic moved eastward from Cape Town's harbour, along the southern coast, along 'major roads'.[37]

Image 3.2. Map of the Colony of Good Hope, 1835

Source: R. Fenner, 'Colony of Good Hope' (London: Joseph Thomas, 1835).

Lungsickness appeared in Fort Beaufort and Albany less than a year after its arrival, although it took longer to reach British Kaffraria (November 1854) and independent Xhosaland (by March 1855).[38] Albany is depicted in the above figure, above Algoa Bay. From Albany and Fort Beaufort it spread via 'principal roads into the interior'.[39] It struck Colesburg and Graaff-Reinet likely because they were 'important traffic junctions'.[40] Colesburg and Graaff-Reinet

[36] Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 537.
[37] Andreas, 'The Spread and Impact of the Lungsickness Epizootic', 54.
[38] *Ibid*.
[39] *Ibid*.
[40] *Ibid*, 55.

are in the interior, above Albany to the left. Lungsickness was in independent Xhosaland by early 1855.[41] Areas such as Albert (March 1855) and Victoria (April 1855), were impacted later, which strengthens Chris Andreas' claim that wagon transport did much to spread the disease.[42]

It is likely that African cattle-keepers saw cattle infected eight months after outbreaks in major settler towns because they restricted cattle movement more assiduously.[43] Since Lungsickness deaths were not recorded, Chris Andreas argues that exports of cattle skin, their hides, provide the best proxy for the epizootic's mortality peaks. By the end of 1855 likely 100 000 animals had succumbed to Lungsickness. That was around twenty per cent of the cattle population. From 1857 mortality rates slowed although the disease did not disappear.[44]

The Lungsickness epidemic in what became the Eastern Cape seems to have peaked in 1855.[45] What was the human response to Lungsickness? In October 1853, several months after the initial outbreak, the Cape Colony published Ordinance I as a response to Lungsickness.[46] Cattle in public spaces, unattended by humans or on a different property owner's land could by law be slaughtered. Burial was compulsory. The movements of infected cattle were to be restricted. Cattle with symptoms were to be quarantined. Cattle were permitted to travel only if they were travelling to be diagnosed or treated. Contraventions were disincentivised by fines. Owing to its epidemiology, including direct transmission, and a long symptomless incubation period, these state responses amounted to very little in terms of stopping the epidemic. The massacre policy was of course for cattle a form of supreme violence. The colonial state was too weak and rudimentary, and lacked the human capital and knowledge to effectively stop an epizootic like Lungsickness. The slaughter-approach in this way indicated the weakness of the colonial state. As the epigraphs of this chapter suggest, this approach frustrated farmers and chiefs alike. As Chris Andreas shows, the British veterinary elite

[41] *Ibid*, 56.
[42] *Ibid*, 55, 61.
[43] *Ibid*, 56–57.
[44] Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 538.
[45] Andreas, 'The Spread and Impact of the Lungsickness Epizootic', 57.
[46] Cape of Good Hope Government, 'Ordinance to prevent the spread of the Cattle Disease, commonly called 'Long Ziekte', Ordinance No. 1, 7 October' (1853), 987–989.

'categorically rejected' vaccinations as a method for controlling outbreaks into the 1880s.[47] The Belgian physician Louis Willems had however in 1852 published results appearing to show that a vaccine for Lungsickness had been determined.[48] While the Cape government ignored these findings, they made their way into contemporary newspapers and journals, empowering some farmers and cattle-keepers with rudimentary knowledge of how to vaccinate cattle. Southern Africa would acquire its first veterinary professional in 1876, and so farmers had to learn and implement invasive inoculation techniques on the basis of what they could learn in newspapers and by trials on living cattle. Cattle were becoming live trial and error subjects of biomedical experiments.

Chris Andreas uncovered various newspapers and journals that provided rudimentary and cursory information about inoculation for Lungsickness, as well as results and experiences from farmers using and adapting these methods. The publications included the *Grahamstown Journal*, the *Graaf-Reinet Herald*, and the *Cape Monitor*. By September 1853, two newspapers published instructions based on Louis Willems' inoculation. The text read:

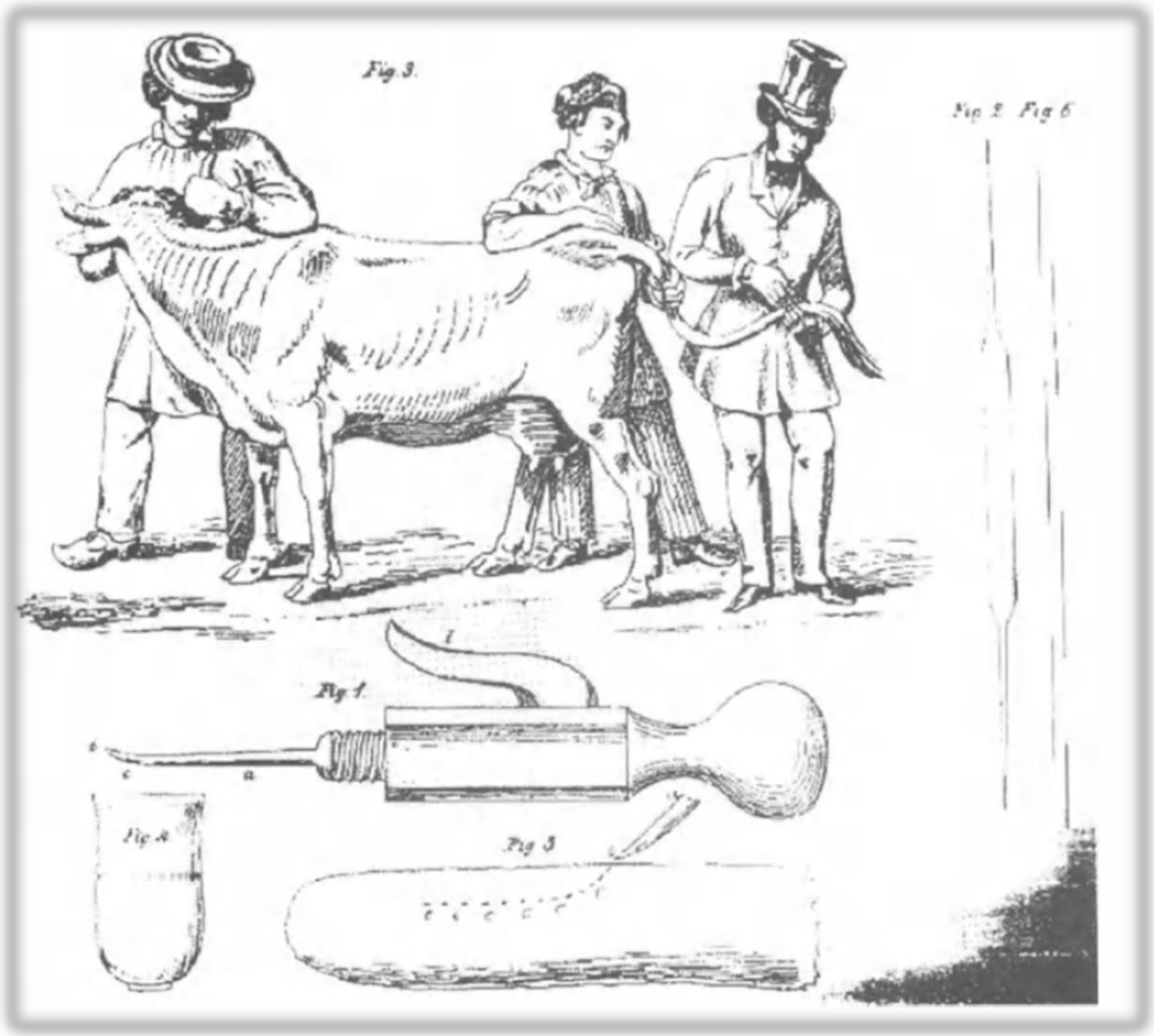
> The healthy cattle are vaccinated, with a lancet or pen knife, at the point of the tail with the humour of the lungs of one of the cattle afflicted with the disease, which is expressly killed for that purpose. After 10 … to 20 days, a strong swelling occurs, and after the lapse of about a month the animal is recovered. It is best to perform the vaccination in two places at the same time, but always in the lower part of the tail.[49]

There are precedents in southern Africa regarding amateur amputations or surgeries on cattle. As shown in Chapter One, Proto Nguni speakers inherited a root word for castration. As part of a wider register for breeding, Proto-Southern Nguni speakers innovated a term for castration by cutting, suggesting that some male cattle and goats had their testes amputated. These were body modifications for controlling animals' reproductive lives. From a bovine view, the above account seems to describe a crude and compelled surgery. As Chris Andreas has argued, these instructions were 'too brief and imprecise', meaning that farmers had to

[47] Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 542.
[48] *Ibid*, 540.
[49] *Cape of Good Hope and Port Natal Shipping and Mercantile Gazette*, 9 September 1853; *Cape Monitor*, 10 September 1853, Cited in Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 545.

extemporise. For cattle, this meant that numerous farmers began experimenting with diverse methods and approaches to vaccinating them. Inoculations comprised a process whereby bacteria-containing fluid from the lung of a cattle who had succumbed was inserted into the tail or dewlap of presumably Lungsickness-negative cattle. To do so, a slit was cut, creating a sort of open flap wound wherein the fluid was inserted.

Image 3.3. Tail inoculation via Louis Willems' method in Europe



Source: C. Spinage, *Cattle Plague: A History* (New York: Springer, 2003), 424.

Such inoculations in dewlaps proved 'extremely deadly'.[50] Owing to crude inoculation methods and a lack of clarity around how much fluid to use, many cattle's tails became gangrenous and had to be amputated. Twenty per cent of cattle inoculated in their tails lost

[50] Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 545.

their lives. Others failed to acquire immunity and died of Lungsickness, tailless, anyway. Where successful, inoculation via this method offered immunity for two years. For cattle, the results of the inoculation admitted of high variation. One remarkable critical voice, writing for the *Grahamstown Journal* in 1854, went some way towards recognising how the inoculation methods were experientially impacting cattle:

> Inoculation has been tried by many parties as a sure preventative, but in several instances it has been fatal in its results on some of the beasts thus operated upon; and it is also attended with so much difficulty, cruelty, and anxiety, as to render the task extremely repugnant, and not at all desirable.[51]

From a perspective of the herd, not only were they afflicted by an epizootic that could take five months of increasing pain and discomfort to kill them, losing kin, friends, and calves in great numbers, but they were also subjected to live biomedical experiments, a fifth of which resulted in death, and many resulting in the loss of their tails. When the critical voice noted that the operation was accompanied by 'difficulty, cruelty, and anxiety', this refers to what it must have taken to render these large bovines immobile while slits were cut into their dewlaps or holes bored into their tails. Further, for cattle, their tails are their main defence against flies. There is clear evidence that tail-docking, amputating cattle's tails, is accompanied by acute pain, which suggests that boring holes into cattle's tails would have caused cattle pain.[52] For cattle, no doubt a great quantity of confusion, anxiety, and what was likely experienced as torture came of the Lungsickness inoculation attempts. Cattle are sensitive even to 'subtle stressors', with one study noting that when cattle are alone in an unfamiliar environment for a few minutes, this can result in 'substantial increases in cortisol secretion, heart rate, and vocalization and block milk ejection'.[53]

Initially, likely wary of the high death rates and variable efficacy, as it happened Lungsickness inoculation was later adopted and adapted by Xhosa and Khoekhoe cattle herders. There is some consensus that inoculation slowed the spread of Lungsickness by the late 1850s in the

[51] *Grahamstown Journal*, 7 October 1854. Cited in Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 547.
[52] M. von Keyserlingk *et al*., 'Invited Review: The Welfare of Dairy Cattle—Key Concepts and the Role of Science', *Journal of Dairy Science* 92, 9 (2009), 4106.
[53] *Ibid*.

Cape Colony. Although inoculation was widely used, the state did not regulate or prescribe inoculation until 1906, at which point inoculation supervised by a state veterinarian and followed by quarantine became mandatory.[54]

When Lungsickness appeared in pre-colonial Namibia some years after emerging in the Cape, inoculation too was the selected response, and, combined with quarantine methods, was initially able to stop the spread of the epizootic. Documented animal diseases were relatively new. Horses first arrived in central colonial Namibia in 1820, and anthrax and African Horse Sickness appeared in 1842.[55] Lungsickness broke out in colonial Namibia in 1856 at a missionary station in today's Warmbad, some 47 kilometres from the Orange River, as the crow flies.[56] Eighty-six of the herd of one hundred cattle died. But by mid-year, the disease was contained and then eradicated via the following methods. First, people in nearby settlements and their cattle fled, using the outpacing method. Second, missionaries prohibited ox-wagon visits. Having been aware of Lungsickness when travelling from Cape Town towards Namibia in 1855, a missionary who witnessed the 1856 outbreak described aspects of it in the *Cape Monthly Magazine* some years later.[57] On 4 January 1856, the missionary learned via *post mortem* that one of his ox labourers had succumbed to Lungsickness. 'A panic seized the people', he writes, 'and all who were able to do so, fled.' And after noting that cattle were the people's 'sole means of support', he wrote, 'the loss of cattle is the greatest evil which can befall these wandering tribes.'[58] He continued that he 'incurred the odium of having introduced the dreaded disease'. Then, he claims, to his 'great relief', that he had 'ascertained' three years later that a Lungsickness fatality had occurred before his arrival, but his own account is likely the first recorded case.[59] By May 20 1856 he recorded that 'no deaths from lung-sickness [had] occurred for some time' and he returned with wagon-pulling oxen to the Cape Colony across the Orange River.[60] Lungsickness, however, returned to Namibia in 1859, and Louis Willem's inoculation method was pursued

[54] Andreas, 'Preventative Inoculation of Cattle against Lungsickness', 555.
[55] Schneider, 'The History of Veterinary Medicine in Namibia', 1.
[56] *Ibid*.
[57] 'My First Journey', *Cape Monthly Magazine*, 1870, 203; 'In the Desert', *Cape Monthly Magazine*, 1871, 95. The second reference is cited in Schneider, 'The History of Veterinary Medicine in Namibia', 1.
[58] 'In the Desert', 96.
[59] *Ibid*, 95; Schneider, 'The History of Veterinary Medicine in Namibia', 1.
[60] 'In the Desert', 102.

soon after the outbreak.[61] The next year Lungsickness was in the Namibian interior.[62] The Herero referred to 1860 as 'Otjipunga' which means 'the year of the lung'.[63] Amraal Lambert, who co-controlled major cattle trafficking enterprises in southern Namibia, would permit no cattle from the coast to drink from the water in his territory.[64] Thomas Baines's account of South West Africa in 1860 to 1861 contains numerous mentions of Lungsickness and inoculation.[65] Thomas Baines appears to have first learned of the tail inoculation method in 1861. He wrote:

> As I accompanied the wagons a short distance from the house, I asked how so many of the oxen had lost their tails, and was told it was the lung sickness — a curious effect of the disease, I thought; but I was further informed that it was usual to inoculate healthy cattle by passing a needle and thread, previously steeped in the virus of the diseased lung, through the skin of their tails. This caused a painful swelling, which, if the needle touched the bone in its passage, extended to the whole hind-quarters, and occasioned the loss of the tail, or perhaps of the animal. I was told that of the cattle not inoculated fifty per cent died, and that the operation reduced the per-centage to twenty-five. How it reached this country is not known.[66]

Interestingly, what this shows is that both the disease and the view of cattle as biomedical experiments had moved from the Cape across the Orange River into South West Africa. Thomas Baines writes a detailed account of the inoculation process in 1861:

> The first operation of the day was to obtain the lung of an ox that had just been slaughtered, and thoroughly to saturate a thread of cotton wick in the diseased matter. The new oxen were then driven into the kraal, lassoed one by one by the hind leg, and thrown by a smart pull upon the tail on the opposite side; a hole was then bored through the skin in the after part of the tuft, taking care not to touch the bone, a piece of the saturated wick drawn through with a sail needle, and tied to prevent its drawing out.[67]

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[61] Schneider, 'The History of Veterinary Medicine in Namibia', 2.
[62] Gewald, *Herero Heroes: A Socio-Political History*, 20.
[63] H. Vedder, *Das alte Südwestafrika*, [*The Old South-West Africa*] (Berlin: M. Warneck Verlag, 1934). Cited in Schneider, 'The History of Veterinary Medicine in Namibia', 2.
[64] T. Baines, *Explorations in South-West Africa* (London: Longman, Green, Longman, Roberts, & Green, 1864), 81.
[65] *Ibid*, 8, 32, 81, 95, 109, 118, 129, 133, 157. Page 8 is cited in Schneider, 'The History of Veterinary Medicine in Namibia', 2.
[66] Baines, *Explorations in South-West Africa*, 8.
[67] *Ibid*, 95.

The outcomes for cattle were either immunity, likely an amputated tail, and one in five times death, according to at least one account. Thomas Baines described one such case:

> A young steer, and a fine well trained trek ox, died from the effects of inoculation. Their tails had already been cut to mere stumps, but the inflammation had spread to their bodies, and all the hindquarters were greatly swelled. During the last hours of life they seemed to suffer from frequent spasm, causing a sudden contraction and rounding of the back and frequent trembling. Froth issued from the nostrils, the eyes became dull and sunken, and gradually the poor beasts sank to the ground, and breathed heavily till life was extinct.[68]

Thomas Baines' descriptive writings provide interesting sources for this investigation in that they have a strong visual component and are keenly perceptive. The twenty per cent death rates from inoculation were startling, and combined with the pain and anxiety and confusion accompanying the operations, these disfigurements were for cattle a terrible outcome. Before rinderpest appeared in 1896, in what became South Africa and Namibia, Lungsickness remained the most significant disease for cattle, and had serious social and economic consequences for settlers and local groups alike. In both areas, the centrality of wagon-pulling cattle labourers for trade and transport made the disease difficult to control. Add to that the disease's long incubation period and the asymptomatic transmission element and a clearer view of its insidiousness emerges. Nama chiefs also attempted to quarantine their herds from herds controlled by other groups. Cattle were banned from walking or pulling wagons in Namaland when *en route* to the Cape. Lungsickness combined with smallpox fractured and then destroyed Amraal Lambert's cattle trafficking network.[69] Three years after colonizing Namibia, in 1887 the Imperial Government passed its first legislation to control animal diseases, aimed at Lungsickness.[70] Lungsickness remained a significant threat in Namibia into the twentieth century.

An analysis of Lungsickness in Namibia and South Africa suggests some qualitative shifts in cattle history. Lungsickness altered cattle-human relationships. Individual-level changes

[68] *Ibid*, 97–98.
[69] Gewald, *Herero Heroes: A Socio-Political History*, 26.
[70] Schneider, 'The History of Veterinary Medicine in Namibia', 3.

included new restrictions on movement, quarantined areas, tail amputations, and death by disease or an inoculation procedure. At the group-level, cattle were becoming biomedical subjects and were governed by inchoate settler state laws. As can be observed in an analysis of rinderpest's effects on cattle, part of the state formation process was about expanding increasing control over domesticated animals. Much research has shown how state formation, colonial settlement and disease epidemics affected people but this investigation demonstrates how colonial dominance also impacted cattle's lives and experiences, and in that way contributes in novel ways to the historiography on Lungsickness. In the Cape Colony and colonial Namibia, the mid-eighteenth century was a time of turmoil and upheaval for cattle. They had started to become subjects of biomedical experiments, and they would later have veterinary departments exert biomedical control over them.

Rinderpest in southern Africa

Rinderpest was the most devastating disease to afflict cattle in southern Africa. Its death rates can exceed 90%, and it is highly transmissible. It was only eradicated globally in 2011.[71] Rinderpest killed cattle and countless free-roaming wild animals across the African continent. Starting in the north of Africa in the late 1880s, by 1896 it made its way to southern Africa.[72] In some areas, 90% of cattle perished from rinderpest, and at least 2.5 million cattle in the region succumbed to the pandemic.[73] The pandemic galvanised the development of veterinary coverage in the region, impoverished humans, facilitated colonial expansion, intensified state control over cattle, stimulated fencing expansive coverage, entailed widespread cattle massacre and quarantine policies, and was a major cause of the erosion of cattle's transhumant relations with Africans.

Semantically, Charles van Onselen came the closest to recognising what rinderpest comprised for southern African cattle. He wrote ambiguously that: '[t]he number of cattle lost was the

[71] T. Sunseri, 'The African Rinderpest Panzootic, 1888–1897', in *Oxford Research Encyclopedia: Cultural History, Medical History* (Oxford University Press, 2018) 1.
[72] *Ibid*, 2.
[73] S. Vogel and H. Heyne, 'Rinderpest in South Africa – 100 Years Ago', *Journal of the South African Veterinary Association* 67, 4 (1996), 166.

most obvious dimension with which to gauge the havoc wrought.'[74] The ambiguously stated thought presented a fork in the road. He came very close to contemplating rinderpest's impacts on cattle themselves. His next thought was to spell out what the loss of cattle meant for human populations. Since then, scholars writing about rinderpest in southern Africa have not approached the panzootic from a bovine perspective, and have regarded its impacts on cattle only in implicit, indirect, and unspoken ways. The historical literature on rinderpest in southern Africa is focused on human political, social, economic, environmental, and veterinary consequences.[75] Charles Van Onselen argued that rinderpest 'revealed and exaggerated' the social, political, and economic 'forces' which led to the industrialisation of South Africa in the twentieth century.[76] Jan-Bart Gewald showed that rinderpest was a key factor in undermining Herero independence and cattle-keeping modes of life, causing loss of land, indebtedness, a turn to minework and riverbed agriculture, political defeat, and facilitating German colonisation.[77] Daniel Gilfoyle indicated that rinderpest strengthened veterinary services and widened an emerging veterinary regime's range of experiments in South Africa.[78] Lance van Sittert regarded rinderpest as a causative factor in the expansion of demarcating colonial boundaries via fencing, in that it 'lent a new urgency' to fencing and patrolling colonial borders.[79] Gary Marquart deepened the analysis by examining rinderpest's epidemiology, and locating the spread of the panzootic in the southern African political and environmental context. Focusing on Bechuanaland as emblematic of the region, Gary Marquart emphasised that processes of colonisation, specifically land transfers under the reserve system, radically disrupted cattle-human relationships. Land was divided into reserves, and large tracts offered to settlers, so that large numbers of cattle were cramped

[74] C. van Onselen, 'Reactions to Rinderpest in Southern Africa 1896-97', *The Journal of African History* 13, 3 (1972), 484.
[75] Gilfoyle, 'Veterinary Research and the African Rinderpest Epizootic'; G. Miescher, *Namibia's Red Line: The History of a Veterinary Settlement Border* (New York: Palgrave Macmillan, 2012); M. Mutowo, 'Animal Diseases and Human Populations in Colonial Zimbabwe: The Rinderpest Epidemic of 1896–98', *Zambezia* 28, 1 (2001), 1–22; P. Phoofolo, 'Epidemics and Revolutions: The Rinderpest Epidemic in Late Nineteenth-Century Southern Africa', *Past & Present*, 138 (1993), 112–43; T. Sunseri, 'The African Rinderpest Panzootic, 1888–1897', 2018; Marquardt, 'Building a Perfect Pest'; G. Campbell, 'Disease, Cattle, and Slaves: The Development of Trade between Natal and Madagascar, 1875-1904', *African Economic History*, 19 (1990), 105–33; Schneider, 'The History of Veterinary Medicine in Namibia.'
[76] van Onselen, 'Reactions to Rinderpest in Southern Africa 1896-97', 488.
[77] Gewald, *Herero Heroes: A Socio-Political History*, 110, 111, 120, 121, 128, 133, 134.
[78] Gilfoyle, 'Veterinary Research and the African Rinderpest Epizootic.'
[79] L. van Sittert, 'Holding the Line: The Rural Enclosure Movement in the Cape Colony, c. 1865-1910', *The Journal of African History* 43, 1 (2002), 104.

into small land areas, and, in the midst of a severe drought, compelled to share water holes with thousands of fellow cattle and other ungulates.[80] Unable to spread herds apart and use transhumance to isolate herds across large areas, the panzootic spread rapidly; thousands of cattle were forced into close proximity with rinderpest-positive animals. Gary Marquart's innovation was to link an understanding of rinderpest's epidemiology to the southern African colonial context and environmental conditions to understand how rinderpest could flourish. This analysis uses and extends Marquart's innovation of seeing like rinderpest – to see like cattle. In this way, the analysis examines how rinderpest affected cattle's trajectory in southern Africa. There is at least one example of an attempt to view rinderpest from a cattle perspective; it is found in a poem, penned by William Scully in 1899, called 'The prayer of cattle smitten by rinderpest'. Written in quintets with rhyming couplets, and steeped in a Judeo-Christian, old-world lexicon, the poem approaches what cattle may have felt as deadly and themselves dying vectors of the terrible plague. Beseeching God directly, the cattle narrative voice pleads with God to: 'Stem Thou the tide of this travail which whelms us a burning sea, which makes our breath a fire to slay our fellows.'[81] But such perspectives are extremely rare.

During this epidemic, cattle history shifted in that cattle became biomedical subjects, monitored and controlled by expanding colonial governments, their movement was restricted by fences, and that many of the relationships cattle held with southern Africans were transformed away from pastoral and transhumant arrangements towards a more commercialised cattle trafficking economy.[82] Various impacts of rinderpest are analysed. These are the initial cattle massacre policies, fencing expansion and wagon labour, and the biomedical experiments and vaccination programs. Colonial control over cattle was dramatically ramped up. Myriad colonial laws and proclamations emerged to control cattle's lives, movement, and (productivity) health. What became Zimbabwe and Namibia, the Cape Colony, and Transvaal all had veterinary officers by 1897. Botswana would get its first in 1905.[83] Veterinary officials symbolised state expansions in these early, consolidating states.

[80] Marquardt, 'Building a Perfect Pest', 355, 357–59, 362.
[81] W. Scully, 'The Prayer of Cattle Smitten by Rinderpest', *The Pall Mall Magazine*, 1899, 435.
[82] Beinart, 'Transhumance, Animal Diseases and Environment in the Cape, South Africa', 17.
[83] J. Falconer, 'History of the Botswana Veterinary Services – 1905-66', *Botswana Notes and Records* 3 (1971), 74–78.

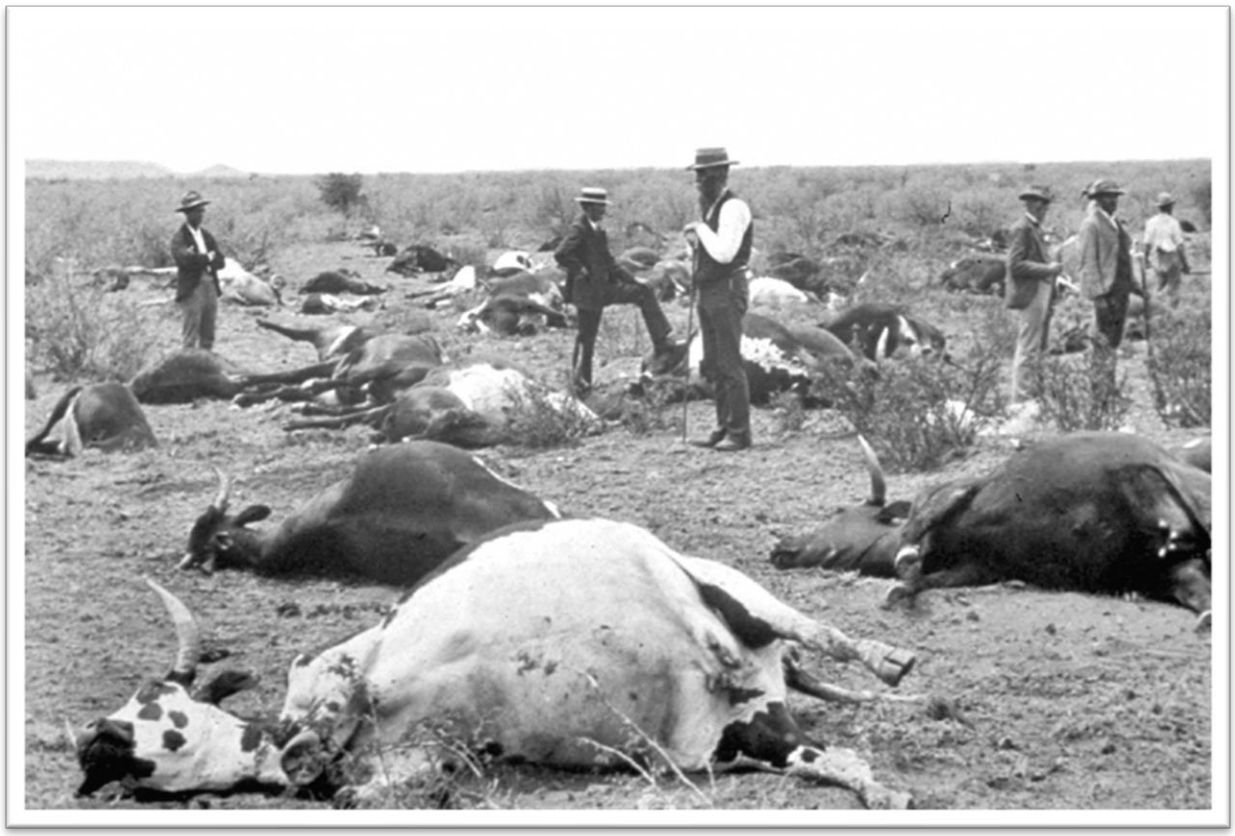
Political philosopher Kimberly Smith has argued that the expansion and consolidation of modern states was, in many ways, driven by increasing control over domesticated animals.[84] 'In general', she writes, 'domestic animals were well integrated into colonial social communities and a major concern of colonial governments.'[85] In southern Africa this was very much the case.[86] Further, as will emerge, control over cattle and other captive animals for nascent colonial states in southern Africa comprised core aspects of colonial state development. Exerting wide-ranging and pervasive control over cattle was an integral part of colonisation processes in the region.

Rinderpest is a contagious disease caused by a virus called *Rinderpest morbillivirus.* It is pathogenic to among others cattle, buffaloes, pigs, sheep, goats, giraffe, eland, kudu, and can more mildly affect impala, hippopotami and camels, and rabbits.[87] As with Lungsickness, rinderpest is passed on by direct transmission of virus-containing aerosols into respiratory systems or eyes.[88] Mortality rates exceed 90%. Rinderpest incubates in a host for three to over 15 days, implying a long asymptomatic transmission period. The disease course is manifested when their temperatures, usually around 37°C, rage to over 40°C.[89] This is accompanied by depression, anorexia, an increased heart rate, dry mouth, and discharges from eyes and mouths.[90] As cell tissues perish, lesions occur on cattle's cheeks, lips, tongues, gums, and genitals. Cattle become heavily diarrhetic; they defecate first water and then later blood and epithelium shreds.[91] As the agonized days pass, cattle become increasingly dehydrated and emaciated. Death comes to cattle between six to 12 days after the fever begins.[92]

[84] K. Smith, *Governing Animals: Animal Welfare and the Liberal State* (New York: Oxford University Press, 2012), 19.
[85] *Ibid*.
[86] See also Chapter Four and Chapter Five.
[87] CABI, 'Rinderpest, Fallopia Japonica', *CABI*, 2020, https://www.cabi.org/isc/datasheet/66195#tooverview, accessed 5 May 2020.
[88] OIE, 'Rinderpest', *OIE, World Organisation for Animal Health*, 2020, https://www.oie.int/en/disease/rinderpest/, accessed 5 May 2020.
[89] *Ibid*.
[90] CABI, 'Rinderpest, Fallopia Japonica', 2020.
[91] OIE, 'Rinderpest', 2021.
[92] *Ibid*.

In March 1896, Orange Free State veterinarian, the University of Stuttgart-trained Otto Henning, described symptoms as including 'fever, weariness, uneasiness, rough coat, failing appetite, increase of pulse and breathing, convulsive trembling of skin, rapid emaciation, and decline of strength'.[93] Chief veterinarian at the Cape Colony Duncan Hutcheon less imaginatively described rinderpest-afflicted cattle as 'dull-looking and lying about without feeding'.[94] A scene of cattle who had succumbed to rinderpest in Vryburg is depicted below.

Image 3.4. Cattle perishing from rinderpest, Vryburg 1896



Source: Wikipedia Commons, 'Cows dead from rinderpest in South Africa, 1896', *Wikipedia* Commons, https://en.wikipedia.org/wiki/Rinderpest#/media/File:Rinderpest_1896-CN.jpg, accessed 3 June 2020.

[93] Her Majesty's Stationery Office, 'Correspondence Relating to the Outbreak of Rinderpest in South Africa in March 1896' (London: Eyre and Spottiswoode, 1896), 30. On page 35 he recommends a massacre policy: 'It is therefore wisest and cheapest to destroy all animals affected at the earliest possible moment, and all carcases, unskinned and complete, should be burnt carefully or deeply buried.'

[94] Hutcheon, *Special Report on Rinderpest in South Africa, from March, 1896, to February, 1897*, 30.

The scene depicted above was the fate of 2.5 million cattle in the region.[95] Rinderpest emerged in north Africa in the late 1880s via colonial cattle trafficking and moved across the Sahel to the Senegal River and east Africa in 1891.[96] The Zambezi River likely slowed its movement into southern Africa. But by 1896 it was spreading rapidly in (what is today) Zimbabwe, Mozambique, Botswana, South Africa, Eswatini, Namibia, and Lesotho. The scale and speed at which rinderpest was killing cattle and other animals caused great alarm among colonial authorities. It brought colonial authorities together. In April 1896 the Orange Free State, Cape Colony, Natal and the South African Republic (Transvaal) met in Mafeking for the first regional rinderpest conference. Represented were a magistrate and a resident from Bechuanaland, veterinary officials, an agriculture commissioner, and a few farmers. The Cape Colony's agriculture minister was chairperson. Agriculture and inchoate veterinary arms of state had to work in league to address the panzootic. The framing of the conference betrayed the British rinderpest response methodology as a foregone conclusion. The conference was held to discuss 'the most effective and economical manner of both preventing and stamping out' rinderpest.[97] The two resolutions bear directly on cattle history. The first was for cattle extremely grim, and existential. It legally prescribed cattle massacres. Delegates agreed that all cattle suspected of being in contact with rinderpest-positive cattle should be shot, since the disease could 'only be effectively dealt with by stamping out.'[98] Masters of healthy cattle killed under this approach were to be compensated. The second resolution was that a vast 'double' fence should run along the western and northern borders of Bechuanaland and where necessary along the Transvaal border. In this way cattle movement would be restricted in an attempt at an interstate quarantine intervention. Backed by colonial law and police, these resolutions signalled increased state attention to and control over cattle's lives, deaths, and movement. The initial resolutions can be summarised as the quarantine and kill method. They aimed to stanch the spread of the panzootic.

The massacre policy was applied across southern Africa, in British Bechuanaland and the Bechuanaland Protectorate, German South West Africa, Natal, Rhodesia, and the Cape Colony

[95] Vogel and Heyne, 'Rinderpest in South Africa – 100 Years Ago', 166.
[96] Sunseri, 'The African Rinderpest Panzootic, 1888–1897', 3–4.
[97] Cape of Good Hope, *Rinderpest Conference Held at Mafeking, April 1896* (Government Printers, April 1896), 3.
[98] *Ibid*.

with the exception of Basutoland and, initially, the Transvaal. Though it has been little dwelled upon in the historiography, it was a calamitous and extremely dangerous period for cattle. Cape government veterinarian Duncan Hutcheon drew on 1893 legislation to compel the massacre policy but added compensation to remove disincentives to report outbreaks.[99] Unattended cattle could be summarily shot. This policy was applied to the Bechuanaland Protectorate and British Bechuanaland.[100] In Rhodesia the Cape's Animal Diseases Act of 1881 was initially adopted and all infected cattle could be killed. In the Cape the 1881 Act was passed to control animals' movement in and out of areas stricken by diseases, however farmers and transport riders' opposition to the movement restrictions made the Act largely unsuccessful.[101] In Rhodesia a controller of cattle was installed, one Henry Taberer, who would later be a major mine labour recruiter for the Native Recruiting Corporation, and he permitted cattle to be shot or treated.[102] In South West Africa, German policy encouraged the few hundred German soldiers and conscripted groups to massacre Herero cattle suspected of carrying rinderpest; whole herds were slaughtered in vain.[103] The massacre policy lasted several months in the Cape Colony.[104] At the second regional rinderpest conference in August 1896, the massacre policy had been abandoned, largely because it was ineffective and controversial, as the epigraphs of this chapter suggest.[105] From a cattle perspective these three to four months were a core part of rinderpest's initial deadly impact. The Cape Colony's rinderpest statistics report did not enumerate how many cattle had been killed via its massacre policy, likely because the policy was highly controversial, broadly resented by farmers and African cattle-keepers, and relatively short-lived.[106] By April 1896, 5 000 cattle had been shot in the Bechuanaland Protectorate, 141 in British Bechuanaland, and 7 800 were slaughtered in Mafeking in addition to the 80 000 cattle who had died in the district.[107] In the

[99] Cape Colony, 'Act to Prevent the Spread of Contagious and Infectious Diseases amongst Cattle and Other Animals. Act No. 27, 1893.' (1893).
[100] Marquardt, 'Building a Perfect Pest', 358.
[101] Beinart, 'Transhumance, Animal Diseases and Environment in the Cape, South Africa', 35–36.
[102] Mutowo, 'Animal Diseases and Human Populations in Colonial Zimbabwe: The Rinderpest Epidemic of 1896–98', 11.
[103] Gewald, *Herero Heroes: A Socio-Political History*, 113.
[104] Select Committee on Rinderpest Contracts, *Second and Final Report of the Select Committee on Rinderpest Contracts* (Cape Town, May 1897), ii.
[105] Cape of Good Hope, *Rinderpest Conference Held at Vryburg, August 1896* (Government Printers, August 1896), 3–4.
[106] Department of Agriculture, *Rinderpest Statistics for the Colony of the Cape of Good Hope, 1896-1898* (Cape Town: Cape of Good Hope, 1898), 1–7.
[107] Clive Spinage, *Cattle Plague: A History* (New York: Springer, 2003), 528.

same month chief Khama III lacked the manpower to bury any more cattle.[108] The processes of killing and burying cattle suspected of being rinderpest-positive were grotesque and undignified. Speaking on a case where 2 291 cattle were massacred, the cattle burials were described as follows: 'They made a long trench and broke the ribs, horns and legs of the animals to pack them closely'.[109] One such degrading trench is reproduced below.

Image 3.5. Suspected rinderpest-positive cattle buried in trenches

Source: A. Mann, *The Boer in Peace and War* (London: John Long, 1900), 76.

One farmer described a case where 107 cattle were shot among homesteads on his farm. Two days later some men started to bury the cattle, which took a week. Some cattle who had experienced and survived rinderpest, referred to as 'salted', were nonetheless killed under the massacre policy. In one case over 500 cattle were shot near homes and then not interred, the rancidity making it 'impossible to live there'.[110] Cattle who succumbed to rinderpest

[108] Her Majesty's Stationery Office, 'Correspondence Relating to the Outbreak of Rinderpest in South Africa in March 1896', 5.
[109] Select Committee on Rinderpest Contracts, *Second and Final Report of the Select Committee on Rinderpest Contracts*, 204.
[110] Cape of Good Hope, *Report of the Select Committee on Rinderpest Contracts* (Cape Town, 1897), 80–81.

sometimes were not buried, as happened when over 16 000 cattle near the Molopo River in northern Transvaal died in a month.[111] At the outset of rinderpest, cattle faced both a pandemic and a massacre policy. A vast amount of cattle grief, has in these respects, been elided and unspoken for in the literature.

While cattle were perishing from rinderpest and nascent-state slaughter policies, large scale fencing and movement prohibitions occurred across the region. Borders and territories were demarcated and protected to form quarantine zones. Throughout southern Africa, rinderpest created an exigency to fence. The fencing expansions indicated a larger process where cattle's transhumant relationships started to become more commercialised and they, cattle, became increasingly commodified. At both regional conferences in 1896 fencing was seen as a primary response to rinderpest.[112] Fencing operations across the region expanded considerably. In Natal, by June 1896, 856 kilometres of fencing were assembled along its borders.[113] Some 7 889 tons of fencing was imported into Natal in the same year.[114] The Cape Colony pursued a *cordon sanitaire*, or quarantine zone approach, and by April 1896 had spent one-tenth of the government annual budget on this project.[115] Barbed wire was set up by the hundreds of kilometres to separate the Cape Colony, Transvaal and the Orange Free State. About 1 568 kilometres of fence ran along the Orange River by December 1896.[116] This formed part of a fencing operation that eventually ran along the borders of the Transkei, Natal, and Basutoland.[117] In the two decades following 1891, fenced land in the Cape Colony expanded from about four to 17 million hectares.[118] In what became Namibia, the German administration's few hundred soldiers and some collaborators ran a 500-kilometre cordon by guarding watering holes, refusing to allow cattle and humans to pass or drink, and slaughtering free-roaming animals.[119] Cattle grazing is always necessarily premised on two things, access to pasture and access to water. In general, fences markedly disrupted cattle's

[111] *Ibid*, 30.
[112] Cape of Good Hope, *Rinderpest Conference Held at Vryburg, August 1896*', 1986. Cape of Good Hope, *Rinderpest Conference Held at Mafeking, April 1896*, 1896.
[113] Spinage, *Cattle Plague*, 554.
[114] Sunseri, 'The African Rinderpest Panzootic, 1888–1897', 19.
[115] Gilfoyle, 'Veterinary Research and the African Rinderpest Epizootic', 139.
[116] Spinage, *Cattle Plague*, 540.
[117] Sunseri, 'The African Rinderpest Panzootic, 1888–1897', 17.
[118] van Sittert, 'Holding the Line', 116.
[119] Miescher, *Namibia's Red Line: The History of a Veterinary Settlement Border*, 25.

access to water, food, and movement, and thus limited their transhumant relations with humans. Such veterinary fencing emerged on scale to combat rinderpest, a process which persists and still impacts free-roaming and domesticated animals.[120] Focusing on animals, fences profoundly impacted animals' agency. Migrations of antelopes, buffaloes, and myriad other species were severely restricted; countless animals were suddenly cut off from crucial water and food supplies.[121] In the Karoo, for example, ecosystems too were starkly disrupted by fencing infrastructure.[122] The fencing of farms also contributed to more intensively capitalistic farming enterprises via enabling more control over flocks and herds and by defining property boundaries. Controlling cattle by fencing persisted across the globe, and in the twenty-first century reached grim logical conclusions.[123]

Part of using quarantine methods to stop rinderpest's spread involved blocking large parts of the wagon routes that had extended across the region. In the Cape, for example, the number of wagon-pulling ox labourers increased from 160 000 to 405 000 between 1855 and 1891, numbering more than horses and mules, who had doubled and tripled, respectively.[124] Humans' primary method of transporting goods and people in the region at the time was wagon-pulling ox labourers. As seen in Chapter Two, cattle were core labourers in a regional wagon transport network. An over 600-kilometre wagon transport system between Bulawayo and Gaborone was disrupted. At one point, on the Kalahari road, 64 000 oxen died and 4 000 wagons were abandoned.[125] The Transvaal banned cattle from Rhodesia and Bechuanaland. Mountain passes between Natal and Basutoland were dynamited to block wagon-pulling oxen from moving between the two.[126] In what became Namibia, these disruptions to wagon

[120] M. Owens and D. Owens, *Cry of the Kalahari* [ebook version] (New York: Houghton Mifflin Harcourt, 1984), 7, 12, 26, 209, 313, 318, 319.
[121] *Ibid*, 313, 318, 319.
[122] S. Archer, 'Technology and Ecology in the Karoo: A Century of Windmills, Wire and Changing Farming Practice', *Journal of Southern African Studies* 26, 4 (2000), 687–96.
[123] Cattle in Antwerp, for example, have shock collars strapped onto them. The shock collars function as an invisible electric fence. When cattle proceed toward a certain perimeter they receive an auditory warning, and when they pass the perimeter they suffer electric shocks – 'many times smaller than they'd get from an electric fence wire' – until they return to within the invisible boundary. The farmers are notified of these movements via an app. See A. Hope, 'Invisible Fences Keep Grazing Angus Cattle in Place', *The Brussels Times*, 26 July 2020, https://www.brusselstimes.com/news/belgium-all-news/168978/la-boum-3-is-not-authorised-says-brussels-mayor-philippe-close-may-bois-de-la-cambre-events-prime-minister-alexander-de-croo/, accessed 26 July 2020.
[124] Beinart, 'Transhumance, Animal Diseases and Environment in the Cape, South Africa', 22.
[125] Vogel and Heyne, 'Rinderpest in South Africa – 100 Years Ago', 166.
[126] Spinage, *Cattle Plague*, 555.

transport and thus human trade galvanised the decision to build a railway from the coast to the interior, Swakopmund to Windhoek.[127] Like fences, railway lines cut across the landscape and disrupted animals' migration routes and access to resources. Trains had not entirely replaced ox labour and wagons by the end of the nineteenth century.[128] But rinderpest did much to speed up the transition away from wagons towards trains, for cattle implying a profound change in their roles and forms of labour.[129]

Neither fencing, massacres, nor blocked wagon routes were able to stop rinderpest's advances. These instruments were mostly blunt, and by March 1897 it raged through what became South Africa. Rinderpest required a medical response, and so colonial states pursued veterinary measures to halt the pandemic. Rinderpest did much to extend the coverage of veterinary infrastructure in the region.

Previous accounts of rinderpest and veterinary developments have focused on the triumphant vaccine work of individual scientists, pluralist and experimental local knowledge forms, the interplay between local and imported knowledge and methods, and the expansion of veterinary activities. [130] Outside of rare exceptions, scholars have not been explicitly attuned to what rinderpest veterinary advances and expansion meant for cattle, what role cattle played in these developments, how they transformed cattle's position in the region and impacted their trajectory.

It was in the wake of rinderpest that veterinary schools emerged in Europe. After the human trouble accompanying rinderpest in France, its first *école pour le traitement des maladies des bestiaux*, or school for the treatment of cattle diseases, was set up in Lyon in 1762. Three years later an *école vétérinaire*, or veterinary school, opened near Paris.[131] The latter model

[127] Gewald, *Herero Heroes: A Socio-Political History*, 134.
[128] G. Pirie, 'Slaughter by Steam: Railway Subjugation of Ox-Wagon Transport in the Eastern Cape and Transkei, 1886-1910', *International Journal of African Historical Studies* 26, 2 (1993), 320.
[129] See Chapter Two.
[130] D. Gilfoyle, 'Veterinary Research and the African Rinderpest Epizootic'; W. Beinart and K. Brown, *African Local Knowledge and Livestock Health: Diseases and Treatments in South Africa* (Johannesburg: Wits University Press, 2013); W. Beinart, K. Brown, and D. Gilfoyle, 'Experts and Expertise in Colonial Africa Reconsidered: Science and the Interpenetration of Knowledge', *African Affairs* 108, 432 (2009), 413–33; K. Brown, 'Tropical Medicine and Animal Diseases: Onderstepoort and the Development of Veterinary Science in South Africa 1908–1950', *Journal of Southern African Studies* 31, 3 (2005), 513–29.
[131] J. Swabe, *Animals, Disease, and Human Society* (London: Routledge, 2005), 67.

became a basis of veterinary schools emerging across Europe. Veterinary schools emerged in Copenhagen (1773), Vienna (1777), Hannover (1778), Dresden (1780), Munich (1790), Berlin (1790), London (1791) and Utrecht (1820).[132]

The expansion of veterinary regimes and coverage across southern Africa was powerfully accelerated by the rinderpest panzootic. The veterinary departments that emerged over this time were effectively new arms of state. They were empowered by increasing legislation regarding animal health, life, and movement. And they wielded tremendous power over cattle at both individual- and group-levels. The veterinary regimes formed bureaucracies, they counted, monitored and intervened in cattle's biomedical lives. The shift for cattle was that colonial states across the region now had arms of state exclusively focused on them. Veterinary departments were tightly linked to agricultural departments and the military and/or police. In this way, three forms of state power came to exert control over cattle's lives – agriculture, veterinary, and military.

From 1896 to 1897 there were four teams of veterinarians working on a rinderpest vaccine. It was the most significant veterinary vaccine development endeavour in the region yet. A team worked under Edinburgh-trained Alexander Edington of the Colonial Bacteriological Institute (CBI), experimenting on cattle in Taungs in British Bechuanaland.[133] The director of the Institute for Infectious Diseases in Berlin, Robert Koch, who had consolidated bacteriology as a science, was sent to Kimberley by the Cape Government and the De Beers mining group, where he was set up at a makeshift research and experiment station.[134] The recently requisitioned Transvaal veterinary official, Swiss-trained Arnold Theiler, and Natal's counterpart, Herbert Watkins-Pitchford, a graduate of the Royal Veterinary College in London, were conducting experiments in Marico in the Transvaal.[135] In 1897 Jules Bordet and Jean Danysz of the Pasteur Institute in Paris were commissioned by the Transvaal

[132] C. Offringa, 'Ars Veterinaria: Ambacht, Professie, Beroep. Sociologische Theorie En Historische Praktijk', *Tijdschrift Voor Geschiedenis* 96 (1983), 415.
[133] A. Edington, *Report of the Director of the Colonial Bacteriological Institute* (Cape Town: Colonial Bacteriological Institute, 1897), 3, 4, 18, 24, 37, 51, 64, 121; Madida, 'A History of the Colonial Bacteriological Institute 1891-1905', 24, 48.
[134] Madida, 'A History of the Colonial Bacteriological Institute 1891-1905', 12–13; Cape of Good Hope, *Reports by Professor R. Koch upon His Investigations into Rinderpest at Kimberley* (Cape Town, 1897), 1.
[135] Spinage, *Cattle Plague*, 425.

government, and worked at the Waterfall experimentation centre in Pretoria.[136] In 1897, what became Zimbabwe and Namibia had official veterinarians too.[137]

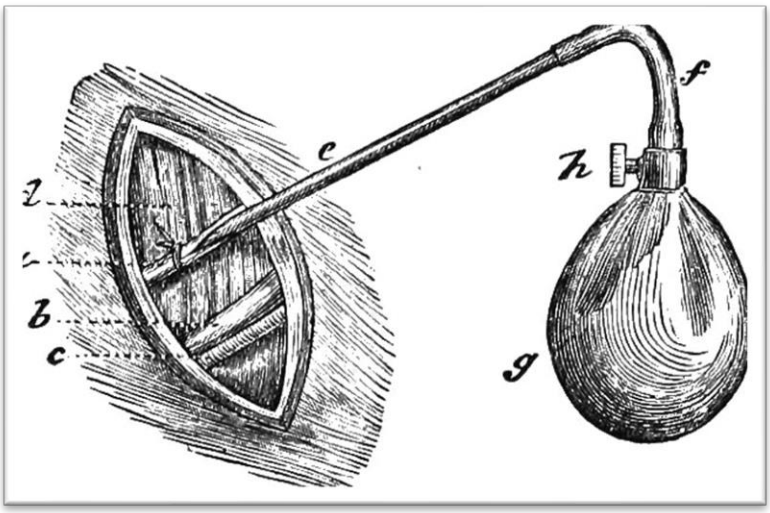
Common to the vaccines developed was the idea of infecting cattle with small doses of the rinderpest virus in blood or bile or a combination of both to develop an immune response against a weak version of the rinderpest virus. The idea was that an immune response could defeat a low viral load. The one exception was Drs Jules Bordet and Jean Danysz's method of injecting two doses of 'salted' cattle blood to confer immunity.[138] All the vaccines developed involved extracting blood and/or bile from cattle, all could lead to mortality, and all the vaccines were developed on the basis of biomedical experiments. For myriad animals, including cattle, an era of live and widespread veterinary experiments had definitively arrived, and would only become more entrenched. Cattle in southern Africa were rapidly entering a biomedical era.

In the context of previous experience of Lungsickness, scab, and African Horse Sickness, the Colonial Bacteriological Institute was set up in Grahamstown in 1891, with Alexander Edington as director. He had visited the Pasteur Institute and the Institute of Infectious Diseases in Berlin.[139] Its laboratories were modelled on European laboratories. Its development was closely tied to the development of the veterinary department.[140] In 1895 it announced an updated Lungsickness vaccine, which it then produced. The CBI was no small operation. In 1897 the CBI exported 3150 smallpox vaccine tubes of the 43 297 it produced. It also produced 1 444 anthrax, and 179 blackquarter, and 70 Lungsickness vaccine tubes.[141] Starting in October 1896 Alexander Edington and colleagues conducted numerous vaccination experiments on cattle in Basutoland, Kimberley, Steynsburg, Alice, Grahamstown, and Taungs. In one case, one of his assistants mentioned 22 000 unconsenting cattle on whom he had performed glycerinated bile experiments. [142] Edington investigated bile and blood serum

[136] *Ibid*, 428.
[137] Gewald, *Herero Heroes: A Socio-Political History*, 116.
[138] Spinage, *Cattle Plague*, 428.
[139] Madida, 'A History of the Colonial Bacteriological Institute 1891-1905', 14.
[140] Ibid, 14–15.
[141] A. Edington, *Report of the Director of the Colonial Bacteriological Institute* (Cape Town: Colonial Bacteriological Institute, 1897), 137–38.
[142] *Ibid*, 59.

vaccination approaches. Bile was drawn from dead cattle, while blood was taken from live rinderpest-positive animals.[143] In a rare passage, Alexander Edington described his method of extracting blood from live cattle. His extraction instrument was 'a long thin cannula with a very sharp incurved point', a contemporary version of which is reproduced below.

Image 3.6. Cannula in the late nineteenth century



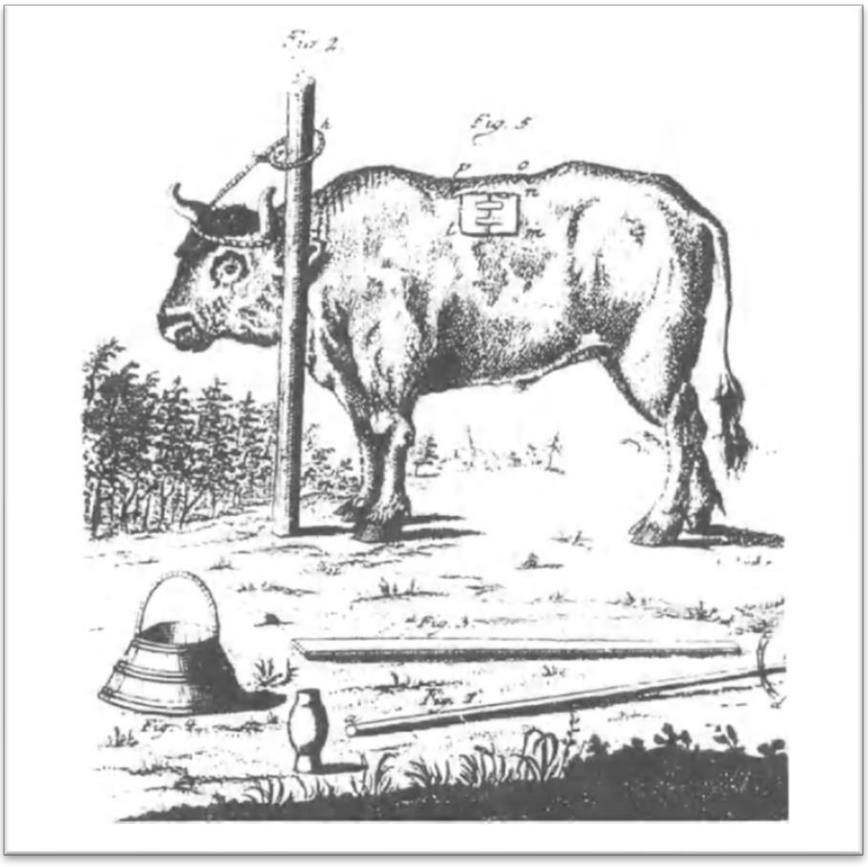
Source: R. Smith, *The Physiology of the Domestic Animals: A Text-Book for Veterinary and Medical Students and Practitioners* (London: F.A Davis, 1890), 276.

'The animal', he reported, 'having been cast, is shaved clean along the site of the jugular vein.' 'In operating for the insertion of the cannula', he continued, 'a short clean incision is made over and parallel to the vein, and while the vein is made tense by pressure below the site of the incision the point of the cannula is made to enter the incision and then thrust into the vein', so that blood can 'issue freely'.[144] By 'cast' Edington meant rendered immobile. A veterinarian inoculating 2 000 cattle in the Overberg in 1896 noted that using the jugular-cannula approach he was able to extract '[a]bout five whiskey bottles' of blood per ox.[145] In 1897 the CBI had extracted and sold 555 300 cubic centimetres, 555 litres, of rinderpest-positive blood for vaccinations.[146]

[143] *Ibid*, 50.
[144] *Ibid*, 38–39.
[145] D. Hutcheon, 'A Review of the Different Methods of Inoculation', *Agricultural Journal of the Cape of Good Hope* 11, 9 (1897), 518.
[146] Edington, *Report of the Director of the Colonial Bacteriological Institute*, 14.

In terms of a bovine perspective, Robert Koch's reports written to the Cape agriculture secretary from Kimberley offer some uncommon glances into his research station in the old mining compound. There, he experimented on animals from December 1896 to March 1897. Initially, Robert Koch wanted to determine whether rinderpest could be transmitted to healthy animals. Describing the yard where 'cattle destined for experiments' waited, he reported that, 'in the middle of the yard is a post erected, where we extract blood and inoculate our animals.'[147] During his experiments, animals' necks were tethered to that post. Frightened cattle awaiting live experimentation watched, heard and smelt their kin being constrained and experimented on.

Image 3.7. Depiction of an ox who has undergone an early rinderpest flank vaccination in 1793



Source: Spinage, *Cattle Plague: A History*, 504.

[147] Cape of Good Hope, *Reports by Professor R. Koch upon His Investigations into Rinderpest at Kimberley*, 4.

The artist's depiction centred the cattle's experimentation wound. There is also the aspect of fear and bewilderment about the inoculated ox, in particular the frightened eye. That the ox had to be tethered to a pole – to prevent him from fleeing – suggests the ox likely did not consent to the inoculation. Owing to the cruelty inflicted on animals, biomedical experiments conducted on animals, also known as vivisection, in Britain, for example, historically inspired protest and strong criticism from various anti-vivisection groups. In Britain, antivivisection movements started after 1824 and persist today.[148] There, the Cruel and Improper Treatment of Cattle Act was passed in 1822.[149] The Act criminalised cruelty towards cattle, although it did not mention vivisection.[150] The British Society of Prevention of Cruelty to Animals, founded in 1824, was in part formed to 'help gather evidence and bring prosecutions' in accordance with the act.[151] In 1876 Britain passed the Cruelty to Animals Act.[152] Except under general anaesthesia, and unless a special certificate was acquired, under this law it became illegal to perform vivisections on mules, asses, horses, dogs, and cats.[153] Animal experimentation became somewhat more closely regulated. Over the nineteenth century, largely modelled on the British Act, cruelty to animals was criminalised in the Cape in 1856, Natal in 1874, the Orange Free State in 1876, and the South African Republic in 1888.[154] The region's first SPCA was founded in 1872 in Cape Town, and across the region 'associate branches and allied organisations' emerged in the last quarter of the nineteenth century.[155] In South Africa, the South African Association Against Painful Experiments on Animals emerged in 1974 and was the first local organisation to motivate for vivisection to be regulated.[156] It emerged nearly eight decades after Robert Koch began his experiments in Kimberley. Still today there are no laws in South Africa to protect animals in research laboratories.[157]

[148] A. Bates, *Anti-Vivisection and the Profession of Medicine in Britain, A Social History* (London: Palgrave Macmillan, 2017), 16–17.
[149] *Ibid*, 15.
[150] *Ibid*, 16.
[151] *Ibid*.
[152] D. Lyons, *The Politics of Animal Experimentation* (Basingstoke: Palgrave Macmillan, 2013), 113.
[153] *Ibid*, 137–138.
[154] L. van Sittert and S. Swart, '*Canis Familiaris*: A Dog History of Southern Africa', in L. van Sittert and S. Swart (eds.), *Canis Africanis: A Dog History of Southern Africa* (Leiden: Brill, 2008), 9.
[155] *Ibid*.
[156] M. Pickover, *Animal Rights in South Africa* (Cape Town: Double Storey Books, 2005), 119.
[157] *Ibid*, 139.

Robert Koch performed experiments on a wide assortment of animals. Describing their incarceration, he reported that of 'the small experimental animals, sheep and goats are sheltered underneath the verandah along the rear wall of the house, and two dogs are tied up to the poles underneath the verandah.' He also conducted experiments on dogs, rats, 'fowls, doves, pigeons, guinea fowls, and a crane'.[158] Hundreds of experiments were performed on unanaesthetised, diverse, and unconsenting animals. 'Birds, rabbits, mice, guinea pigs, and pigs', he wrote, were 'housed in cages…alongside the stable walls' where a donkey and mule were also detained.[159] The donkey was experimented on, while the mule's station was to pull a wagon along a rail, loaded with faeces and animals who had perished from experimentation or rinderpest to a large mass grave, 30 by ten feet in extent, and ten feet deep, into which 'the carcasses and litter of the animals that [sic] have succumbed to rinderpest are thrown'. The mule-pulled wagon ran through the compound 'passing all the stables and sheds' where a menagerie of frightened animals waited their turn.[160] For animals, it was a scene that would make Dante Alighieri's nine circles of hell seem unfantastical.

Of the cattle's housing, he wrote, '[s]ome of the cattle which [sic] we experiment on are placed in open boxes (sheds) and some in closed stables'. He spoke of future plans to keep separate those cattle who 'were not yet operated upon apart from the others outside the yard'. Animals who were experimented on were 'securely fastened'.[161] Unreassuringly, he said that '[o]ur animals are attended to and looked after in a suitable manner'. After two months, announcing his work 'finished in the main', and on the basis of a small experiment, declared that injecting bile into uninfected cattle conferred sufficient immunity.[162] In cases where there were insufficient numbers of cattle from whom to draw bile, Koch recommended infecting healthy cattle with rinderpest-positive blood, slaughtering them after six to seven days, and then extracting their bile.[163] His method involved subcutaneously injecting bile into cattle's dewlaps and ensuring that it was 'well rubbed in'.[164]

[158] Cape of Good Hope, *Reports by Professor R. Koch upon His Investigations into Rinderpest at Kimberley*, 13.
[159] *Ibid*, 5.
[160] *Ibid*.
[161] *Ibid*.
[162] *Ibid*, 20–21.
[163] *Ibid*, 21.
[164] Hutcheon, *Report of the Colonial Veterinary Surgeon for the Year 1902*, 8.

Koch's method had many disadvantages for cattle. Cattle injected with bile were in some cases unable to walk or walked painfully for a week. An early test recorded a twenty per cent mortality rate from his vaccine.[165] In some cases healthy cattle who were inoculated with bile became infected and spread rinderpest themselves. Another drawback, from the view of the herd, was that seven per cent of the herd had to be killed – to extract bile – to vaccinate the rest of the herd. In Edington's method, three per cent of the herd were thus sacrificed.[166] Whatever the method, the vaccination coverage was vast. Between 1896 and 1898 cattle were inoculated in 55 districts in the Cape Colony.[167] The two primary methods were bile and blood inoculations.[168] By 1897, 1.5 million cattle had been inoculated via the Cape government, about a third of the cattle population, and they wanted to vaccinate 400 000 more.[169] In the Transkei and Pondoland, around 200 000 cattle were vaccinated, about one in four of the cattle population.[170] There were large scale vaccination programs in Basutoland, and what became Zimbabwe and Namibia, too.

After Robert Koch's bile vaccinations were performed on cattle in Basutoland, one observer claimed that 70 000 cattle had been spared from rinderpest by Koch's vaccine. 'The BaSotho', writes Pule Phoofolo, 'popularly embraced immunisation after initial suspicions had abated.'[171] Cattle mortality appears to have been at around 40%, when looking at cattle population figures between 1891 and 1904.[172] An estimated two million bile vaccines were conducted in the region between 1896 and 1898.[173]

The German authorities requisitioned Paul Kohlstock, one of Koch's assistants, to come to Namibia to respond to rinderpest, and he arrived in Hereroland in June 1897.[174] Thereafter,

[165] Miescher, *Namibia's Red Line: The History of a Veterinary Settlement Border*, 28.
[166] D. Hutcheon, *Report of the Colonial Veterinary Surgeon and the Assistant Veterinary Surgeons for the Year 1897* (Cape Town, 1897), 19.
[167] Department of Agriculture, *Rinderpest Statistics for the Colony of the Cape of Good Hope, 1896-1898*, 2–7.
[168] Hutcheon, *Report of the Colonial Veterinary Surgeon for the Year 1902*, 8.
[169] 'Inoculation against Rinderpest', *Agricultural Journal of the Cape of Good Hope* 11, 9 (1897), 497.
[170] J. Soga, *Report of the Colonial Veterinary Surgeon and the Assistant Veterinary Surgeons for the Year 1897* (Cape Town, 1897), 84.
[171] P. Phoofolo, 'Face to Face with Famine: The BaSotho and the Rinderpest, 1897-1899', *Journal of Southern African Studies* 29, 2 (2003), 524.
[172] *Ibid*, 525.
[173] Spinage, *Cattle Plague*, 431.
[174] Gewald, *Herero Heroes: A Socio-Political History*, 115–116.

writes Jan-Bart Gewald, 'a systematic inoculation programme followed', with the Germans ordering all cattle to be vaccinated.[175] The whole country was subdivided into vaccine zones, and settlers, soldiers, officers and civil servants received vaccination training.[176] Further eroding cattle's transhumant and pastoral relations with the Herero, German officials extracted vaccination taxes in the form of cattle or grazing land, in one case by the force of seventy men and a cannon.[177] As in the Cape, cattle owned by settlers and groups associated with the government were more likely to receive vaccinations.[178] In 1897 a research laboratory, the Imperial Bacteriological Institute – focused on rinderpest, Lungsickness, and horse sickness – was set up close to Windhoek.[179] Controlling cattle with veterinarians, military personnel, and bureaucracies formed part of the German colonial state's establishment: it was a core colonial state-building process.

In Matabeleland in 1897 inoculation centres emerged in Queen's Kraal, Tuli, Khami, Gwelo, Manzinyama, Ramaquabane, and Bulawayo.[180] Equipment was brought across from Kimberley, and cattle were inoculated with rinderpest-positive blood and serum.[181] In 1896 the Southern Rhodesian Veterinary Services Department was 'tentatively established' to combat animal diseases impacting domesticated cattle, including the up to two hundred thousand Ndebele-owned cattle recently stolen by the British South Africa Company.[182] In 1898 vaccine stations in Matabeleland started to close for want of unvaccinated cattle.

Exactly to what extent the various vaccines worked is hard to determine. Reports from farmers and veterinarians alike suggested mixed results. Sometimes mortality rates were

[175] *Ibid*, 116.
[176] Schneider, 'The History of Veterinary Medicine in Namibia', 4.
[177] Gewald, *Herero Heroes: A Socio-Political History*, 134.
[178] Gilfoyle, 'Veterinary Research and the African Rinderpest Epizootic', 151; Miescher, *Namibia's Red Line: The History of a Veterinary Settlement Border*, 28–30.
[179] Schneider, 'The History of Veterinary Medicine in Namibia', 4.
[180] Mutowo, 'Animal Diseases and Human Populations in Colonial Zimbabwe: The Rinderpest Epidemic of 1896–98', 12.
[181] *Ibid*.
[182] I. Phimister, 'Meat and Monopolies: Beef Cattle in Southern Rhodesia, 1890-1938', *The Journal of African History* 19, 3 (1978), 396; W. Mwatwara and S. Swart, '"If Our Cattle Die, We Eat Them but These White People Bury and Burn Them!" African Livestock Regimes, Veterinary Knowledge and the Emergence of a Colonial Order in Southern Rhodesia, c. 1860-1902', *Kronos* 41, 1 (2015), 116.

high, and in other cases survival rates were high.[183] In the Cape Duncan Hutcheon would later claim that 65% of cattle had survived rinderpest, predominantly owing to vaccinations.[184]

In what became South Africa, Namibia, Zimbabwe and Botswana, it was the cattle who were owned by those groups of settlers or associated with settlers and the colonial governments who were most likely to receive vaccinations.[185] There were in some cases stark differences in the death rates of cattle belonging to settlers and cattle belonging to local groups. Differential access to, acceptance of, and expertise regarding vaccines meant that large numbers of cattle belonging to African cattle-keepers and transhumant pastoralists succumbed to rinderpest.

In southern Africa rinderpest impoverished many cattle-keeping local groups because many cattle in relationships with them succumbed. Numbers of Basotho cattle appeared to bounce back after rinderpest.[186] Acknowledging that rinderpest's effects were uneven, and differentiated, the point is that in general rinderpest did much to erode many of cattle's transhumant relations. That major regional employer, the Chamber of Mines, no doubt noticed a shift from cattle-keeping to proletarianism, because in 1896 they reduced mine wages by 30% and extended working hours.[187]

Reflecting on the erosion of transhumance in the Cape, in terms which bear relevance regionally, William Beinart has written:

> Clearly, veterinary regulation and the curtailment of transhumance were associated with the rise of capitalist patterns of production, with state authority, and with scientific approaches. Clearly, they reinforced white dominance over a great deal of farmland. But there were significant benefits from controls over transhumance. This was accompanied by a rapid rise in livestock numbers, in black as well as white hands, and very likely an overall improvement in animal health. The epizootics that characterised the period discussed — from lungsickness in the early 1850s to east coast fever in the

[183] Spinage, *Cattle Plague*, 425–37.
[184] See Department of Agriculture, *Rinderpest Statistics for the Colony of the Cape of Good Hope, 1896-1898*, 7.
[185] Mwatwara and Swart, '"If Our Cattle Die, We Eat Them but These White People Bury and Burn Them!"', 130; Gewald, *Herero Heroes: A Socio-Political History*, 134.
[186] Phoofolo, 'Face to Face with Famine', 527.
[187] Phoofolo, 'Epidemics and Revolutions', 137.

> early 1910s — dwindled. Average yields of wool from sheep, for example, roughly doubled in the half century after the Scab Act. The reasons for these processes are complex, but it is likely that veterinary interventions played a major role. For African livestock owners the outcome was more ambiguous. But they still held about half the cattle in the country in 1930, and very significant progress was made in combating disease in their herds and flocks.[188]

But the benefits William Beinart listed were certainly not benefits from a cattle or sheep perspective, from the view of the herd or the flock. In William Beinart's conceptions of animal agriculture and capitalist agricultural development, the animals themselves are not perceived as sentient subjects, endowed with experiential, affective capacities. Sheep, cattle, and goats are not perceived as beings for whom historical shifts matter in personally felt ways. The offspring of post-rinderpest cattle may have proliferated but they were born into increasingly commercialised, fenced, and intensively medicalised relationships with their human masters. Eroded transhumance and rising cattle populations only meant that many more of them would meet their end in industrial slaughterhouses and/or be genetically engineered via breeding regimes. For cattle, sheep, pigs, and goats, industrial slaughterhouses were places of stark horror. As I show in the next chapter, industrial slaughterhouses in Cape Town and Johannesburg were designed in the early twentieth century to kill about one animal per minute.[189] The institutionalisation of mass, perpetual slaughter was part and parcel of cattle's shift from transhumance modes of life into capitalist systems of production. A doubling wool output just meant that double the number of sheep were exploited, commodified, and regarded as resources in an industrialising colonial state. This is not to suggest that cattle had idyllic transhumant modes of life prior to rinderpest and expanded settler colonial states. Hitherto, cattle were trafficked via numerous 'rustling' enterprises, many were maimed, kidnapped or killed in wars or raiding expeditions across the region, and many others were killed for export or changing human modes of consumption. But as cattle's transhumant modes became less common, so they entered an era of industrialisation and global trade, in which they were conceived of as commodities by settler groups and colonial states. In terms of how cattle were viewed, the shift was substantially ontological, in that cattle were becoming increasingly objectified as pure commodities.

[188] Beinart, 'Transhumance, Animal Diseases and Environment in the Cape, South Africa', 40–41.
[189] See Chapter Four.

It may be true that Lungsickness, rinderpest, and East Coast fever were largely controlled via veterinary regimes. But from a cattle perspective, these diseases were colonial imports and were spread by imposed forms of colonial labour (wagon-pulling). Transhumant strategies for outpacing epidemics had been disrupted by colonial boundary-marking, which had sharply limited transhumant cattle movements. The wide-reaching veterinary laws and regimes may have spared domesticated animals from some diseases but they were premised on distinctly authoritarian controls over their lives, movement, and health. Veterinary regimes were not interested in maintaining cattle health for cattle's sake but rather because cattle were regarded as moveable, profitable, self-replicating assets, to be used and then killed. Cattle were valued by colonial states for their skin (hides), secretions (milk), flesh (beef), and their labour (plough and wagon-pulling). Conceived in this way, it is more accurate to say that veterinary regimes were interested in cattle's production health not cattle's health *per se*. When a human-centred approach is deployed, the above impacts on cattle are at best obscured and at worst blanked out.

East Coast fever and the emergence of dipping regimes

It would be remiss to close this historical investigation without noting the other majorly impactful cattle epidemic that struck cattle around the turn of the century in the Transvaal, Natal, Swaziland, and Southern Rhodesia. East Coast fever (ECF) is an intractable tick-borne disease. Cattle perish from their lungs becoming waterlogged, and emaciation; they become unable to draw oxygen and starve to death.

The literature on East Coast fever has been preoccupied with scientific advances, usually of a few European men,[190] rural resistance to the expansion of dipping infrastructure,[191] the

[190] P. Cranefield, *Science and Empire: East Coast Fever in Rhodesia and the Transvaal* (Cambridge: Cambridge University Press, 1991), 20–21.
[191] C. Bundy, '"We Don't Want Your Rain, We Won't Dip": Popular Opposition, Collaboration and Social Control in the Anti-Dipping Movement, c.1908–16', in C. Bundy and W. Beinart (eds.), *Hidden Struggles in Rural South Africa* (Johannesburg: Ravan Press, 1987), 191–221; S. Marks, 'The Zulu Disturbances in Natal', in R. Rotberg and A. Mazrui (eds.), *Protest and Power in Black Africa* (New York: Oxford University Press, 1970), 213–57.

widening of veterinary systems,[192] and dipping tanks as a form of social control over Africans linked to the enumeration of cattle and taxation.[193] What is omitted is the recognition that the expanding veterinary responses to ECF entailed distinct qualitative experiences for cattle, that their lives were radically altered by new dipping regimes, that they were live test subjects, that they were goaded through tanks of arsenic with whips and shouting, that they experienced fear, confusion and anxiety, and that dipping tanks would mark cattle's landscapes and experiences indefinitely.

In Southern Rhodesia, there was an outbreak of ECF in 1902.[194] As with rinderpest and Lungsickness, ECF spread rapidly via vast wagon route networks.[195] It is likely that cattle carrying East Coast fever ticks were imported into Rhodesia to shore up cattle populations after rinderpest. There, between a third and a half of the cattle who had survived rinderpest had died from ECF by 1903.[196] East Coast fever was first noted in the Transvaal in May 1902, and in Swaziland in the same year.[197] In the same year, the eradication of ECF had become as nationally significant as the eradication of Scab had been for sheep.[198] By 1904 it had spread across the Transvaal and into Natal, and in 1910 it crossed the Transkei and soon affected much of South Africa.[199]

With the devastation of rinderpest still fresh in the minds of colonial administrators, a regional Inter-Colonial Veterinary Conference was convened in Bloemfontein in 1903, where Portuguese East Africa, Rhodesia, Basutoland, Bechuanaland, German South West Africa, the Cape, Natal, and Transvaal were represented. The conference attendees agreed to resolutions including controlling cattle movement, restricting imports and exports,

[192] D. Gilfoyle, 'The Heartwater Mystery: Veterinary and Popular Ideas about Tick-Borne Animal Diseases at the Cape, c. 1877 - 1910', *Kronos*, 29 (2003), 139–60.
[193] W. Mwatwara, '"Even the Calves Must Dip": East Coast Fever, Africans and the Imposition of Dipping Tanks in Southern Rhodesia, c.1902–1930', *South African Historical Journal* 66, 2 (2014), 348.
[194] *Ibid*, 323.
[195] Cranefield, *Science and Empire: East Coast Fever in Rhodesia and the Transvaal*, 19–20.
[196] T. Dolan, 'Dogmas and Misunderstandings in East Coast Fever', *Tropical Medicine & International Health* 4, 9 (1999), A4.
[197] A. Theiler, 'East Coast Fever', *Journal of the Royal Army Medical Corps* 3, 6 (1904), 599.
[198] Gilfoyle, 'The Heartwater Mystery', 153.
[199] Campbell, 'Disease, Cattle, and Slaves', 114.

slaughtering cattle where outbreaks had occurred, fencing and quarantining infected areas, dipping cattle or removing their ticks, and promoting further research.[200]

In 1904 the Transvaal passed legislation making the slaughter of cattle compulsory where isolated outbreaks occurred, enabling the optional slaughter of cattle on infected farms, and incentivising fencing infected farms, town, lands and roads.[201] The Portuguese administration in Mozambique pursued a vigorous slaughter campaign in response to ECF, which appeared to stop the disease by 1917 but had by 1923 reduced the cattle population to a fraction of what it had been before ECF.[202] In Natal in 1904 the government started subsiding the construction of dipping tanks.[203] The government in Rhodesia initially refused to finance a fencing regime and was unwilling to pay for compensation accompanying a slaughter policy, largely because the British South Africa Company Shareholders in London were unsure of financial returns and were concerned that acknowledging the disease would impact share prices.[204] Rhodesia did however pursue a slaughter-the-infected approach combined with quarantine and movement restrictions.[205]

Robert Koch was again requisitioned to southern Africa to try to find a cure for ECF but his inoculation method, despite inoculating thousands of cattle, was largely unsuccessful. This time it was Herbert Watkins-Pitchford, Natal's state bacteriologist, who determined after experiments starting in 1908, that ECF-carrying ticks could be destroyed by repeatedly dipping cattle every 72 hours for five days.[206] The method of dipping cattle in arsenic was learned from experimenters in Australia, who had used arsenic to control the cognate cattle disease redwater, however the solution was too toxic to dip cattle at intervals of less than ten to 14 days, and badly scalded cattle and caused skin lesions.[207] Herbert Watkins-Pitchford published

[200] A. Diesel, 'The Campaign against East Coast Fever in South Africa', *Onderstepoort Journal of Veterinary Science and Animal Industry* 23, 1–2 (1948), 19.
[201] Cranefield, *Science and Empire: East Coast Fever in Rhodesia and the Transvaal*, 196.
[202] Diesel, 'The Campaign against East Coast Fever in South Africa', 21.
[203] Campbell, 'Disease, Cattle, and Slaves', 115.
[204] Cranefield, *Science and Empire: East Coast Fever in Rhodesia and the Transvaal*, 206; I. Phimister, *An Economic and Social History of Zimbabwe, 1890–1948: Capital Accumulation and Class Struggle* (London: Longman, 1988).
[205] Mwatwara, '"Even the Calves Must Dip"', 324.
[206] Diesel, 'The Campaign against East Coast Fever in South Africa', 21.
[207] R. Norval, B. Perry, and A. Young, *The Epidemiology of Theileriosis in Africa* (London: Academic Press, 1992), 25.

results from 15 different dipping methods visited upon hundreds of cattle, calves, sheep, and horses.[208] Myriad dipping experiments were conducted.[209] Dipping cattle in arsenic repeatedly would become the primary method of responding to East Coast fever, an approach that is still used today. In Rhodesia, dipping began officially in 1904 when the Animal Diseases Consolidation Ordinance was passed. By 1914 a more targeted and specific Compulsory Dipping Ordinance was passed.[210] 78% of farms had to dip cattle and there were 450 dipping tanks in 1914. Four years later there were 1263 dipping tanks in Rhodesia.[211] Before 1910 dipping was not widely used in the Transvaal but after then it was the near-exclusive method.[212] In the Cape there were 179 dipping tanks by 1909.[213] In the eastern districts of the Cape Colony 50% of dipping tank costs were subsidised by the government, and by 1908 there were 154 tanks in that area.[214] A Cattle Cleansing Act was passed in 1908, prohibiting cattle with ticks to pull wagons or walk on public roads, outspan areas or commonages.[215] It also stipulated that all cattle had to be dipped every 30 days.[216] In 1911 the Union of South Africa passed the Dipping Tanks (Advances) Act no 25 of 1911 to subsidise the construction of dipping tanks.[217] A consolidated Diseases of Stock Act no 14 of 1911 was also passed, which regulated responses to 17 animal diseases, including East Coast fever.[218] By animals, the Act only meant domesticated animals, including sheep, goats, cattle, donkeys, mules, pigs and dogs. By 1920 all infected areas except Swaziland and Portuguese East Africa had built thousands of dipping tanks and had on average one dip for every 1 000 cattle, except Natal which had one dip per 300 cattle.[219]

[208] H. Watkins-Pitchford, 'Dipping and Tick-Destroying Agents' (Pretoria: Union of South Africa Department of Agriculture, 1911), Index to schedules.
[209] A. Theiler, 'Some Observations Concerning the Transmission of East Coast Fever by Ticks', *Transactions of the Royal Society of South Africa* 2 (1910), 319–38.
[210] 'Compulsory Dipping Ordinance', *Rhodesian Agricultural Journal* 11, 6 (1914), 854–56.
[211] Mwatwara, '"Even the Calves Must Dip"', 333.
[212] P. Viljoen, 'The East Coast Fever Problem in the Union' (PanAfrican Agriculture and Veterinary Conference, Pretoria: Government Printer, 1930), 147.
[213] Gilfoyle, 'The Heartwater Mystery', 158.
[214] Norval, Perry, and Young, *The Epidemiology of Theileriosis in Africa*, 26.
[215] Gilfoyle, 'The Heartwater Mystery', 159.
[216] Norval, Perry, and Young, *The Epidemiology of Theileriosis in Africa*, 26.
[217] Union of South Africa, 'Act No. 20 of 1911 Dipping Tanks (Advances)' (1911).
[218] Union of South Africa, 'Act No.14 of 1911 Diseases of Stock' (1911).
[219] Norval, Perry, and Young, *The Epidemiology of Theileriosis in Africa*, 26.

Leading up to this point thousands of cattle were dipped in experimental solutions and varying strengths of arsenic. Many cattle were burned badly as the procedure was variously trialled. There was variation in the types of dips used but the basic principle was that cattle would be compelled by whips and shouting to walk through a long narrow trough containing arsenic, so that just their heads were above the metalloid chemicals. One cattle inspector in Salisbury in 1910 described the effects of arsenic dipping on cattle:

> Cattle seem to feel the effects of the dip. Transport riders particularly say that their oxen are not able to pull their loads for a couple of days. In the Salisbury tank, beasts were burned [sic] and were not able to pull their loads for a week.[220]

There were many additional drawbacks for cattle. Sometimes the arsenic concentration was too strong, so that it was absorbed through cattle's skin and they became poisoned, or, cattle would drink the arsenic, ostensibly from thirst,[221] and then perish, although suicide cannot be ruled out as a possibility. When calves were dipped alongside adult cattle, they were often injured, and could at worst drown.[222] There is no doubt that as sensate, emotionally-endowed beings with sensory facilities connected to central nervous systems, and rich individual psychologies, cattle experienced bewilderment, anxiety, stark discomfort and confusion from the arsenic dipping procedures. For cattle across southern Africa compelled dipping in tanks of arsenic became an ineluctable feature of their lives, which persists to this day.

Conclusion

This chapter examined the impacts of the three major cattle diseases that struck the southern African herds from the mid-nineteenth into the twentieth century. It approached the diseases with a focus on what they meant to cattle, what shifts they entailed, and what befell cattle as groups and individuals as a consequence of them. The period covered saw myriad new laws come to govern cattle's lives and deaths, their movements and relationships, and their productive health. It indicated the extent to which colonial states came to interfere with and

[220] Mwatwara, '"Even the Calves Must Dip"', 329.
[221] *Ibid*, 332.
[222] *Ibid*.

control their modes of being. What emerged was that significant aspects of colonial state expansion were based on exerting control over cattle. Veterinary and animal research regimes came to wield much power over cattle and people, linked as these regimes were to agricultural departments and state forces like the police and military. As inchoate and expanding colonial states quarantined and limited the movement of cattle, in response to the disease outbreaks, so too did they demarcate, define, and extend their territories and reaches. A core part of colonial control over southern African people was premised upon controlling the cattle in relations with them. Some of the state responses to the diseases, in particular the massacre policies, bore profound consequences for cattle communities, who faced ravaging epidemics or even pandemics alongside state injunctions to kill them. Cattle's old-world modes of life, in particular transhumant relations with humans, were sharply curtailed by the thousands of kilometres of fences set up across the region, and in that the cattle owned by settler and settler-related groups in general suffered lower death rates.

The chapter also focused on what veterinary responses meant for cattle. It showed that cattle increasingly became subjects of crude trial and error vaccination and dipping experiments, that live animal research endeavours became entrenched as key functions of expanding colonial states. It emphasised the disease courses of Lungsickness and rinderpest, to bear witness to and record what befell millions of individual cattle. Whereas cattle have previously featured in historical investigations as statistics, whether as death tolls, or quantities of hides or butter or milk or weights of flesh, this investigation sought to present cattle as subjects with feelings and experiences and psychologies of their own, beings capable of anxiety, disorientation, and loss. Each disease epidemic had discrete impacts on cattle at individual- and group-levels.

Lungsickness involved an asymptomatic transmission period of 20 days to three months, implying that many cattle infected their kin unwittingly. This also made the disease extremely difficult to quarantine, although an 1853 ordinance in the Cape attempted to restrict their movement. Unattended cattle could be, and often were, legally slaughtered. The disease attacked cattle's lungs, causing their lung tissue to harden and fluids in their lungs to congest, suffocatingly. Their joints swelled, making standing, resting, and walking painful. Over 100 000 thousand cattle succumbed, essentially by them being unable to draw oxygen.

Numerous farmers learned crude vaccination methods from newspapers and trialled diverse methods on cattle, such that cattle started to become biomedical subjects. In 1876 southern Africa acquired its first veterinary official. Many cattle painfully lost their tails. Approximately one-fifth of presumed Lungsickness-negative cattle died from attempted inoculations. Both the disease and inoculation methods crossed the Orange River into Namibia in the mid-nineteenth century. Fifty years after Lungsickness was first detected the Cape government regulated and prescribed Lungsickness vaccinations, supervised by veterinary officials.

The chapter devoted the most attention to rinderpest because it impacted the entire region, it was the most harmful disease to cattle – its mortality rates could exceed 90% – and because rinderpest had the most significant group-level impacts on cattle. In Europe rinderpest galvanised the emergence of veterinary schools. In southern Africa, rinderpest entrenched the need for veterinary expertise, such that the Cape Colony, the Transvaal, what became Southern Rhodesia and Namibia all had veterinary officers by 1897. Like Lungsickness, rinderpest was followed by cattle massacre and quarantine policies, although with rinderpest these policies occurred across the region. Rinderpest stimulated far-reaching fencing instalments, which restricted cattle movement, dramatically disrupted free-roaming animals' migrations, severely disrupted cattle's transhumance modes, and for cattle and myriad other animals, cut off access to food and water. Beyond cattle, rinderpest afflicted a wide assortment of animals. Rinderpest's incubation period is shorter than Lungsickness', three to 15 days, implying a shorter asymptomatic transmission time. Cattle lost weight rapidly, suffered diverse lesions, diarrhoea, depression, and emaciation. Death usually occurred after 12 agonised days. At least 2.5 million cattle in the region died. Rinderpest saw regional cooperation amongst colonial authorities and rendered the need for veterinary services unmistakable, which stimulated the development of veterinary arms of state. Like Lungickness, it was spread in large part by oxen performing forced wagon labour and thus moving into unaffected areas. By destroying cattle's transhumance relationships, expanding fencing infrastructure and defining colonial territory, expanding veterinary coverage, and involving the police and military in attempts to enforce veterinary policy, rinderpest sped up colonisation processes in the region for cattle, and humans. Rinderpest saw state power deepen. Since vaccinations largely resolved the rinderpest challenge, vaccination-production capacities were extended, and cattle as biomedical subjects became normalised. Land in

various parts of the region was divided into quarantine and vaccination zones. Between 1896 and 1898 an estimated 2 million cattle were subjected to bile vaccinations.

At the turn of the century, East Coast fever struck the Transvaal, Natal, colonial Swaziland and what became Southern Rhodesia. As with Lungsickness, East Coast fever is a tick-borne disease that afflicts cattle's lungs, such that cattle suffer an inability to draw oxygen; cattle become unable to eat and thus starve to death. Dipping tanks proliferated, and are still used to prevent cattle diseases. Experientially, dipping tanks were unpleasant and often painful for cattle. The proliferation of dipping tanks symbolised the expansion of veterinary infrastructure and colonial control of cattle's production health. As with rinderpest, ECF saw regional colonial cooperation, and mass slaughter policies to try to stanch the disease. All three disease epidemics caused profound shifts to cattle history in southern Africa.