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

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Finally, to the cattle, although we will probably never deserve to be among you, and though you will probably never know it, this one was for you.

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List of acronyms

ANT	Actor-network Theory
APRU	Animal Production Research Unit
AWSSA	Animal Welfare Society of South Africa
BMC	Botswana Meat Commission
CBI	Colonial Bacteriological Institute
CDA	Critical Discourse Analysis
CDC	Colonial Development Corporation
CDF	Colonial Development Fund
ECF	East Coast fever
FAI	Forced Artificial Insemination
JSCMB	Joint Slaughterhouses Committee Minute Book
MSC	Markets and Slaughterhouses Committee
PTSD	Post-traumatic stress disorder
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SPCA	Society for the Prevention of Cruelty to Animals
VOC	Dutch East India Company
WWF	World Wildlife Fund

Nederlandse samenvatting

Dit proefschrift is een vanuit vee geschreven geschiedenis van het kolonialisme in zuidelijk Afrika, voornamelijk tussen 1652 en de jaren tachtig van de 20e eeuw. Daarmee neemt het afstand van de gebruikelijke mensgerichte benadering in de geschiedkunde. Dit proefschrift kan geplaatst worden binnen het bredere genre van de diergeschiedenis maar is vernieuwend in de zin dat vee consequent wordt gerepresenteerd als subjecten die zelf ervaringen en gevoelens hebben. Het bekijkt kolonialisme vanuit een diergericht paradigma. Dit proefschrift verkent de impact die kolonialisme heeft gehad in zuidelijk Afrika door in te zoomen op de invloed van kolonialisme op vee als groepen en als individuen. De belangrijkste vraag is: wat zijn de belangrijkste invloeden die kolonialisme heeft gehad op de ervaringen van vee in zuidelijk Afrika? Vier belangrijke invloeden van het kolonialisme worden uitgelicht en behandeld, te weten de ossenarbeid, ziekte-epidemieën en de reacties van overheden en de veterinaire wereld op die epidemieën, de ontwikkeling van industriële slachthuizen, en de ontwikkeling van moderne koloniale veeteeltregimes. De geografische reikwijdte is regionaal en omvat het huidige Botswana, Zuid-Afrika, Lesotho, Eswatini, Namibië en Zimbabwe. Het proefschrift bestrijkt vrijwel uitsluitend de koloniale periode, vanaf de aankomst van de Verenigde Oost-Indische Compagnie in Kaap de Goede Hoop in 1652 tot de jaren tachtig van de vorige eeuw. Er wordt een beroep gedaan op divers bewijsmateriaal om de subjectieve gevolgen van het kolonialisme voor het vee te onderzoeken, waaronder tot nu toe ongebruikt archiefmateriaal, officiële verslagen, architectonische ontwerpen van slachthuizen, historisch onderzoek naar slachthuizen in Zuid-Afrika, verslagen van achttiende- en negentiende-eeuwse reizigers en missionarissen, talrijke afbeeldingen en diverse briefwisselingen. Het historisch onderzoek gaat uit van een interdisciplinaire benadering en combineert kennis vanuit verschillende disciplines om het zelf-ervarend vermogen van vee te begrijpen. De belangrijkste uitkomst is dat het kolonialisme een transformerend effect heeft gehad op de geschiedenis van het vee en de ervaringen van vee in de regio. Daarnaast stelt dit proefschrift dat het mogelijk is om een diergerichte geschiedenis te schrijven, en dat historische bronnen kunnen worden ingezet om een redelijk inzicht te geven in de historische ervaringen van vee. De thesis is een pleidooi om ons begrip van het kolonialisme te verbreden en ook te kijken naar hoe het kolonialisme invloed heeft gehad op dieren.

English summary

This thesis is a cattle-centred history of colonialism in southern Africa, principally from 1652 until the 1980s. It opts out of the conventional human-centred approach to historical scholarship. This thesis is located within the broader animal history genre but innovates in that cattle are presented as experiential, sentient subjects in a sustained way. It views colonialism from within an animal-centred paradigm. The thesis explores impacts of colonialism in southern Africa in terms of how colonialism impacted cattle as groups and as individuals. Its primary question is: what are some of the major impacts of colonialism on cattle's experiences in southern Africa? It is a sustained investigation of how cattle were subjectively impacted by colonialism. Four major impacts of colonialism are isolated and investigated. These are oxen's wagon labour, disease epidemics and veterinary and state responses to the epidemics, the development of industrial slaughterhouses, and the development of modern colonial cattle breeding regimes. The geographical scope is regional, including present-day Botswana, South Africa, Lesotho, Eswatini, Namibia, and Zimbabwe. The thesis almost exclusively covers the colonial period, from the Dutch East India Company's arrival at the Cape of Good Hope in 1652 until the 1980s. Diverse evidence is invoked to explore the subjective impacts of colonialism on cattle, including previously unused archival material, official records, architectural designs of slaughterhouses, historical investigations into slaughterhouses in South Africa, eighteenth and nineteenth century travellers' and missionaries' accounts, numerous images, and diverse correspondence, for example. The historical investigation takes an interdisciplinary approach by drawing on diverse disciplines to understand cattle's experiential capacities. The core finding is that colonialism had transformative impacts on cattle history and cattle's experiences in the region. Additionally, the thesis contends that animal-centred histories are possible, and that historical sources can be interpreted to draw reasonable inferences about cattle's historical experiences. The thesis argues that understandings of colonialism should be widened to include the ways in which colonialism affected animals.

Introduction

> As a historian, trying to piece together the whole picture, these traces of wolf voices, so lifelessly recorded in archival documents, still haunt me. I can never feel I have done justice to [them] without having tried to comprehend what these voices said.[1] – Brett Walker

> At moments when stuck, or struggling over a passage or concept, I would stop and ask: 'What would you say if an elephant were standing right in front of you listening? What would you say that is honest and would not make you feel ashamed?' [2]– Gay Bradshaw

> By incorporating your tongue we [cattle], the foundation, the mute, are pulled into existence, into the spotlight of human thought. There, once acknowledged, we become real. But as we face the threshold of history we realize that outside language we are still nothing. You only hear the foundation when you can teach it to speak. I can only point to my absence, hoping that in this failure of properly portraying me a hole would appear in the world, through which a cow could enter. That's what this is.[3] – Laura Gustafsson and Terike Haapoja

[1] B. Walker, *The Lost Wolves of Japan* (Seattle: University of Washington Press, 2009), 29.
[2] G. Bradshaw, *Elephants on the Edge: What Animals Teach Us about Humanity* (New Haven: Yale University Press, 2009), xix.
[3] L. Gustafsson and T. Haapoja, 'History According to Cattle', in L. Gustafsson and T. Haapoja (eds.), *History According to Cattle* (New York: Punctum books, 2015), 3.

Introduction

The discipline of history is conventionally about humans. History really means human history.[4] But, if animals also forge and experience history, then history is also about animals. This historical investigation rests on the premise that conscious, sentient life is not exclusive to humans, that across the animal world consciousness is distributed in different degrees, not different kinds.[5] Animals are feeling, conscious subjects. Animals too have felt, internal, qualitative experiences of life. And, so, this history is a bit different. It abandons the anthropocentric view that humans are the exclusive site of value, of what is interesting, of what is important. It shifts the primary focus from humans onto animals. It is a *cattle-centred history of southern Africa*.

Part of recognising animals as subjects, this thesis argues, includes weaving their experiences into the narrative – perceiving, regarding, and depicting them as beings who have subjective, felt experiences. More particularly, the project is focused on major impacts of colonialism on southern African cattle's experiences from the seventeenth to the late twentieth century. Its primary question is: what were some of the major impacts of colonialism on the lives and experiences of cattle in southern Africa?

This thesis' introduction comprises five main parts. It opens by responding to the question 'why a cattle history?' and in doing so presents four primary rationales which underpin and contextualise this historical investigation. Second, it conducts a historiographical investigation into animal histories generally, and focuses on animal histories that treat themes of colonialism and imperialism, literature on animals as labourers, and histories that present animals as subjects. Third, there is a substantive theoretical engagement with the

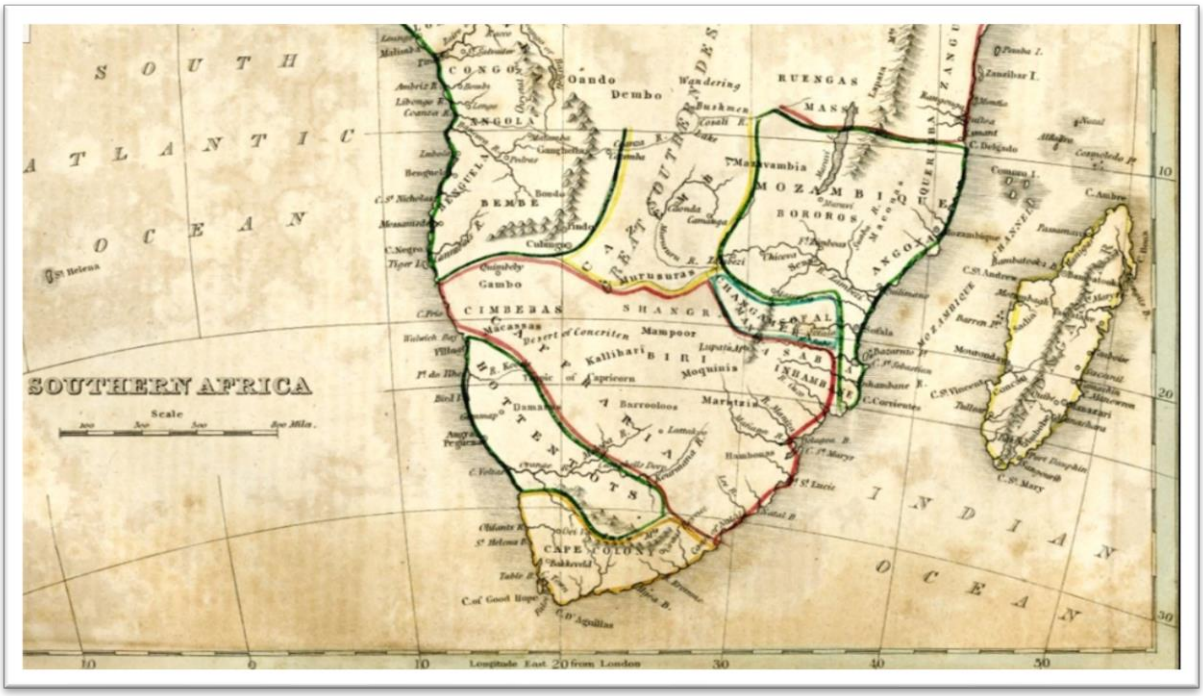
[4] Y. Harari, *Sapiens: A Brief History of Humankind* (London: Vintage Books, 2014), 1. On page 1, Yuval Harari writes: 'About 70,000 years ago, organisms belonging to the species Homo sapiens started to form even more elaborate structures called cultures. The subsequent development of these human cultures is called history.'

[5] P. Low, 'The Cambridge Declaration on Consciousness.' 7 July 2012, J. Panksepp, D. Reiss, D. Edelman, B. van Swinderen, P. Low, and C. Koch (eds.), 2012, https://fcmconference.org/img/CambridgeDeclarationOnConsciousness.pdf., accessed 13 January 2013; J. Panksepp, 'Affective Consciousness: Core Emotional Feelings in Animals and Humans', *Consciousness and Cognition* 14, 1 (2005), 30–80; D. DeGrazia, 'Sentience and Consciousness as Bases for Attributing Interests and Moral Status: Considering the Evidence and Speculating Slightly Beyond', in L. Johnson, A. Fenton, and A. Shriver (eds.), *Neuroethics and Nonhuman Animals* (Cham: Springer, 2020), 17–31.

concept of animal agency, which motivates for a distinctive conceptualisation of animal agency for historical research. Fourth, the project's methodological approach is described. Finally, the thesis' research questions and overviews of the remaining chapters are presented.

Recognising that animals have minds and experiences, the thesis aims to produce a cattle-centred history of southern Africa, based on a methodology of centring cattle in their own right, and weaving into the narrative plausible, scientifically informed descriptions of major shifts in their experiences. Southern Africa here comprises the current six southernmost nation states in Africa, namely Lesotho, Eswatini (formerly Swaziland), South Africa, Namibia, Botswana, and Zimbabwe. In turn, the following three maps depict the region before regional colonialism, during colonialism, and at present. The map below is from circa 1835 and depicts the southern African region before the 1884 Berlin Conference.

Image I.1. Map of southern Africa, circa 1835



Source: T. Bradford, 'Southern Africa, circa 1835', *Afriterra, The Cartographic Free Library*, http://catalog.afriterra.org/viewMap.cmd?number=2286, accessed 4 February 2019.

The second map, Image I.2, depicts southern Africa in 1946. Although it was produced to indicate the sources of labour for the Chamber of Mines' labour recruitment agencies, it does

clearly indicate colonial territorial boundaries in the mid-twentieth century. The Union of South Africa, South West Africa, Swaziland, Basutoland, the Bechuanaland Protectorate, and Southern Rhodesia are depicted.

Image I.2. Map of southern Africa, 1946

Source: A. Stead (contributor), 'Map of southern Africa, 1946', *University of Cape Town Digital Collections*, https://digitalcollections.lib.uct.ac.za/collection/islandora-30052, accessed 19 January 2019.

Image I.3. Map of southern Africa, 2021

Source: Google Maps, 'Map of Southern Africa', *Google Maps*, 2021. Google.com/maps, accessed 21 February 2021.

Rationales

There are four motivations for this animal history, and each provides context to it. The first is that colonialism has largely been conceptualised as an exclusively human-impacting affair. The second rationale concerns the central place that humans have had in southern African cattle herds before colonialism. The third motivation is the way that an animal-centred history of colonialism connects interestingly to contemporary interests in decolonisation. The fourth rationale is that on the basis that animals are sentient, their subjective experiences deserve inclusion in historical scholarship.

The colonial expansion into the interior of southern Africa from the mid-seventeenth century has been a predominant theme in social science and humanities studies of the region. Scholars are accustomed to thinking about colonialism as a human affair; humans colonise and humans are colonised. Almost all scholarship on colonialism is in one way or another about its impact on humans. That has been the core orientation in studies on colonialism. But humans in southern Africa were not the only ones impacted by colonialism. Myriad animals, including cattle, were dramatically impacted, also.[6]

The term colony, 'colonie', emerged in about 1384 in the Wycliffe Bible, and signified a Roman settlement.[7] The term colonialism emerged in 1853 and its meaning, system of colonial rule, became more prominent from 1884, when European powers divided up the African continent among European nation states at the Berlin Conference.[8] The Stanford Encyclopedia of Philosophy defines colonialism as 'a broad concept that refers to the project of European political domination from the sixteenth to the twentieth centuries that ended with the national liberation movements of the 1960s.'[9] In all three editions of Ania Loomba's influential *Colonialism/Post-colonialism* (1998, 2005, and 2015), the definition of colonialism remains identical:

> the conquest and control of other people's land and goods. But colonialism in this sense is not merely the expansion of various European powers into Asia, Africa or the Americas from the sixteenth century onwards; it has been a recurrent and widespread feature of human history.[10]

[6] M. Glover, 'A Cattle-Centred History of Southern Africa?', in J-B. Gewald, M. Spierenburg, and H. Wels (eds.), *Nature Conservation in Southern Africa Morality and Marginality: Towards Sentient Conservation* (Leiden: Brill, 2018), 33, 43.
[7] R. Barnhart, *The Barnhart Dictionary of Etymology* (New York: The H.W Wilson Company, 1988), 190.
[8] *Ibid*.
[9] M. Kohn and K. Reddy, 'Colonialism', in E. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (Metaphysics Research Lab, Stanford University, 2017), https://plato.stanford.edu/archives/fall2017/entries/colonialism/, 26 June 2019.
[10] A. Loomba, *Colonialism/Postcolonialism* (London: Routledge, 1998), 2; A. Loomba, *Colonialism/Postcolonialism* (New York: Routledge, 2005), 3; A. Loomba, *Colonialism/Postcolonialism* (London: Routledge, 2015), 20. Outside of military institutions, British public schools, and, strangely, academic writing and some newspapers, it is often impolite to refer to people by their surnames only. Thus, in-text, I have opted to refer to scholars by their full names. For a fuller justification see D. Benatar, 'Why Don't Academics Address Each Other Politely?', *Times Higher Education*, 31 January 2019, https://www.timeshighereducation.com/opinion/why-dont-academics-address-each-other-politely, accessed 27 April 2021.

What these two definitions have in common is that they understand colonialism from a human-centred paradigm. In the first, colonialism ended with human nation state liberation movements from the 1960s, and in the stipulation that colonialism is about 'people's land and goods', the second is explicitly human exclusive. But countless sentient animals too inhabited the land taken via colonial conquest and became subject to pervasive colonial laws, processes, and institutions. This thesis specifically explores how cattle were impacted by colonialism. A wider conception of colonialism, a multi-species conception, enables one to explore impacts of colonialism on animals, also.

Second, cattle have a long history in southern Africa, and they share it with humans. Cattle are historically central to the lives of southern Africans.[11] Cattle radically transformed the lives and societies of southern Africans. And so, southern Africans are central to the lives of cattle. Cattle and sheep and people have coevolved over around two millennia in southern Africa.[12] Across the region and beyond, the lives of cattle and humans were interwoven and connected in myriad ways.[13] Cattle were producers and resources in these relationships. Milk was taken from lactating cows' udders, the females, and calves and, rarely, more ceremonially, cattle flesh was eaten by human groups.[14]

[11] M. Hall, 'The Role of Cattle in Southern African Agropastoral Societies: More than Bones Alone Can Tell', *Goodwin Series* 5 (1986), 83–87; A. Kuper, 'Traditions of Kinship, Marriage and Bridewealth in Southern Africa', *Anthropology Southern Africa* 39, 4 (2016), 267–80; Boonzaier, E., C. Malherbe, P. Berens, and A. Smith., *The Cape Herders: A History of the Khoikhoi of Southern Africa* (Cape Town: David Philip, 1996); F. Lander and T. Russell, 'The Archaeological Evidence for the Appearance of Pastoralism and Farming in Southern Africa', *PLOS ONE* 13, 6 (2018), 1–21; J-B. Gewald, *Herero Heroes: A Socio-Political History of the Herero of Namibia, 1890 - 1923* (Oxford: James Currey, 1999); A. Smith, *African Herders: Emergence of Pastoral Traditions African Archaeology Series* (Walnut Creek: AltaMira Press, 2005). And see Chapter One.

[12] K. Sadr, 'The First Herders at the Cape of Good Hope', *African Archaeological Review* 15, 2 (1998), 101–32; M. Hall, *The Changing Past: Farmers, Kings and Traders in Southern Africa, 200-1860* (Cape Town: David Philip, 1987).

[13] M. Herskovits, 'The Cattle Complex in East Africa', *American Anthropologist* 28, 1 (1926), 230–72; E. Evans-Pritchard, 'The Sacrificial Role of Cattle Among the Nuer', *Africa* 23, 3 (1953), 181–98; R. Mtetwa, 'Myth or Reality: The Cattle Complex in South East Africa, with Special Reference to Rhodesia', *Zambezia* 6, 1 (1978), 23–35; E. Kreike, 'De-Globalisation and Deforestation in Colonial Africa: Closed Markets, the Cattle Complex, and Environmental Change in North-Central Namibia, 1890–1990', *Journal of Southern African Studies* 35, 1 (2009), 81–98.

[14] 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), 384; K. Sadr, 'A Short History of Early Herding in Southern Africa', in M. Bollig, M. Schnegg, and H-P. Wotzka (eds.), *Pastoralism in Africa: Past, Present and Future* (New York: Berghahn, 2013), 172–78.

Cattle were considered capital, economic items that held value and could be exchanged. A chief's patronage relationships, his following – that is, *his power* – was premised upon controlling cattle.[15] Chiefs loaned cattle to humans lower down the political order, such as sub-chiefs and men wanting to marry. Cattle possession enabled centralised political systems. Cattle radically transformed political and spiritual systems. Wars and raids were conducted for possession of cattle, for what cattle signified in the social and economic worlds of southern Africans.[16]

In this way, cattle were intimately related to the political and economic orders of many southern African societies. A herdsman in Lesotho later characterised the relationship between many cattle and southern Africans quite vividly,

> if we should run out of all animals it is a very bad thing. It means our entire way of life is finished. Now that would be to destroy our culture and all that is proper for us…They are terribly important. They are the most important thing.[17]

In summary, cattle were the very beings upon which pastoral and cattle-keeping economies, wealth, power, influence, and chieftaincies were based. Since cattle were predictably available to humans, it was convenient for humans to include cattle in a range of ceremonies at different life stages.[18] *Lobola*, the exchange of goods including cattle as bride wealth, shows quite how involved cattle were in the reproduction of human social and familial bonds.[19] Especially from the eleventh century, cattle have been at the core of the economic, political and social worlds of many southern Africans.[20] The next chapter discusses how cattle became embedded into the lives of southern Africans, especially from the eleventh century.

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[15] Kuper, 'Traditions of Kinship, Marriage and Bridewealth in Southern Africa', 273.
[16] R. King, 'Cattle, Raiding and Disorder in Southern African History', *Africa* 87, 3 (2017), 607–609, 614–615, 618–624.
[17] J. Ferguson, 'The Bovine Mystique: Power, Property and Livestock in Rural Lesotho', *Man* 20, 4 (1985), 652.
[18] A. Kuper, *Wives for Cattle: Bridewealth and Marriage in Southern Africa* (London: Routledge & Kegan Paul Books, 1982), 11.
[19] H. Marwewe and G. Mamabolo, *Shall Labolo Live or Die? Two Opposing Viewpoints on the Passage of Cattle Gifts in Bantu Marriage* (Cape Town: The African Bookman, 1945).
[20] R. Jimenez, '"Slow Revolution" in Southern Africa: Household Biosocial Reproduction and Regional Entanglements in the History of Cattle-Keeping among Nguni-Speakers, Ninth to Thirteenth Century CE', *The Journal of African History* 61, 2 (2020), 150, 160, 175; Kuper, *Wives for Cattle: Bridewealth and Marriage in Southern Africa*, 11; Kuper, 'Traditions of Kinship, Marriage and Bridewealth in Southern Africa', 273.

More deeply, like humans, animals are sentient and experience the world. Sentience is the capacity for affective states, to experience feelings, negative and positive valences, to feel pain and pleasure.[21] This is the third major motivation for writing an animal-centred history. In 2012 prominent neuroscientists signed the Cambridge Declaration on Consciousness, which stated that:

> The absence of a neocortex does not appear to preclude an organism from experiencing affective states. Convergent evidence indicates that non-human animals have the neuroanatomical, neurochemical, and neurophysiological substrates of conscious states along with the capacity to exhibit intentional behaviors. Consequently, the weight of evidence indicates that humans are not unique in possessing the neurological substrates that generate consciousness. Nonhuman animals, including all mammals and birds, and many other creatures, including octopuses, also possess these neurological substrates.[22]

Especially since this declaration, and owing to compelling and diverse evidence of animal sentience, denials of sentience for birds, fish, mammals, and reptiles are implausible.[23] It *feels* like something to be an animal. Animals have interior, qualitative, *felt* experiences of life. The core reason animals are interesting in their own right, the core reason that animals matter intrinsically, is that animals are sentient.[24] Animals perceive, have beliefs about, and sensory experiences of the world; animals act in response to the world.[25] Cattle, like all mammals, birds, and fish, have neurological correlates for consciousness.[26] Towards the end of this chapter, I return to the significance of animals' minds in the theoretical discussion of animal agency.

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[21] DeGrazia, 'Sentience and Consciousness', 17–18.
[22] Low, 'The Cambridge Declaration on Consciousness', 2012.
[23] DeGrazia, 'Sentience and Consciousness', 18–28.
[24] P. Cavalieri, *The Animal Question: Why Nonhuman Animals Deserve Human Rights* (New York: Oxford University Press, 2001); M. Nussbaum, *Frontiers of Justice: Disability, Nationality, Species Membership* (Cambridge: Harvard University Press, 2006); S. Donaldson and W. Kymlicka, *Zoopolis: A Political Theory of Animal Rights* (New York: Oxford University Press, 2011).
[25] H-J. Glock, 'Agency, Intelligence and Reasons in Animals', *Philosophy* 94, 4 (2019), 1, 4–7, 20, 23–24.
[26] L. Marino and K. Allen, 'The Psychology of Cows', *Animal Behavior and Cognition* 4, 4 (2017), 474–98; Panksepp, 'Affective Consciousness'; J. Balcombe, *What a Fish Knows: The Inner Lives of Our Underwater Cousins* (New York: Farrar, Straus and Giroux, 2016); T. Birkhead, *Bird Sense: What It's Like to Be a Bird* (London: Bloomsbury Publishing, 2012); C. Brown, 'Fish Pain: An Inconvenient Truth', *Animal Sentience: An Interdisciplinary Journal on Animal Feeling* 1, 3 (2016), 1–5.

The fourth motivation connects to extant decolonisation debates' exclusion of animals, and the implicit assumption that animals were not also impacted by colonisation. In South Africa and other former colonies, and also in the United States, the United Kingdom and parts of Europe, debates about decolonisation have recently resurfaced. Themes in debates about decolonisation include epistemological concerns about local epistemologies versus so-called Western-centric epistemologies, the Africanisation of universities, the demographic profiles of university staff and the professoriate, African-centred curricula, decolonising museums, free education, the role of statues and monuments, and identity politics.[27]

One core assumption underpinning these debates is that decolonisation – and therefore, *implicitly*, colonisation – is an exclusively human phenomenon. Animals do not feature in decolonisation debates. Animals' striking absence gave me pause, and I wondered what effects colonialism had on animals. I wondered whether colonialism in southern Africa really affected humans but not animals. Stirred by this question, this thesis endeavours to present a sustained history of colonialism in southern Africa by analysing colonialism's impact on the lives and experiences of cattle. In doing so, it aims to contribute to debates about decolonisation by exploring whether animals were impacted by colonialism. The aim is to

[27] A. Mbembe, 'Future Knowledges and Their Implications for the Decolonisation Project', in J. Jansen (ed.), *Decolonisation in Universities: The Politics of Knowledge* (Johannesburg: Wits University Press, 2019), 239–54; A. Phiri and D. Mupotsa, 'On Decolonising Teaching Practices, Not Just the Syllabus', *The Conversation*, 15 July 2020, http://theconversation.com/on-decolonising-teaching-practices-not-just-the-syllabus-137280, accessed 15 July 2020.; B. Banerjee, J. Rodriguez, and S. Dar, 'Beyond Name Changes and Pulling down Statues – How to Decolonise Business Schools', *The Conversation*, 13 July 2020, http://theconversation.com/beyond-name-changes-and-pulling-down-statues-how-to-decolonise-business-schools-142394, accessed 13 July 2020; K. Dotson, 'On the Way to Decolonization in a Settler Colony: Re-Introducing Black Feminist Identity Politics', *AlterNative: An International Journal of Indigenous Peoples* 14, 3 (2018), 190–99; R. Albertus, 'Decolonisation of Institutional Structures in South African Universities: A Critical Perspective', *Cogent Social Sciences* 5, 1 (2019), 1–14; A. Chaudhuri, 'The Real Meaning of Rhodes Must Fall | Amit Chaudhuri', *The Guardian*, 16 March 2016, http://www.theguardian.com/uk-news/2016/mar/16/the-real-meaning-of-rhodes-must-fall, accessed 16 March 2019; Ministry of Foreign Affairs, 'Four-Year Study to Be Conducted into Decolonisation of the Dutch East Indies', *Government of the Netherlands*, 27 February 2017, https://www.government.nl/latest/news/2017/02/27/four-year-study-to-be-conducted-into-decolonisation-of-the-dutch-east-indies, accessed 30 March 2017; J. Bogué, 'Decolonising Dutch Museums: Stolen Heritage to Be Returned? (blog)', *DutchReview*, 26 October 2020, https://dutchreview.com/culture/decolonising-dutch-museums/, accessed 29 October 2020; A. Elliott-Cooper, '"Free, Decolonised Education"—A Lesson from the South African Student Struggle', in J. Arday and H. Mirza (eds.), *Dismantling Race in Higher Education: Racism, Whiteness and Decolonising the Academy* (Cham: Springer International Publishing, 2018), 289–96; L. Chube, 'Botswana: "Decolonise, Africanise Education"', *allAfrica.com*, 21 May 2019, https://allafrica.com/stories/201905220711.html, accessed 1 June 2019.

move debates about colonialism, and implicitly decolonisation, beyond that standard human-centred paradigm.

Having outlined the rationales for this project, and indicated why cattle in southern Africa are investigated, this chapter turns to a historiographical discussion of animal histories generally, animal histories and colonialism, animals in labour history, and animal histories that regard animals as subjects. Each empirical, historical chapter of this thesis opens with a cursory, chapter-specific historiography. The present aim is to locate the thesis as a whole within the broader animal historiography.

Animals in histories

The broader literature within which this project is situated is wide and diverse. In the last three decades, a diverse cohort of historians have written what might be called animal histories. Animal histories here refers to histories that feature animals as core themes or lenses through which historical change is perceived and described. Animal history started to become more prominent after Ritvo Harriet published *The Animal Estate: The English and Other Creatures in Victorian England* in 1987.[28] Since then, the field of animal history has become increasingly established, evidenced by workshops, conferences, special issues, monographs, edited volumes, and many scholars self-identifying as animal historians.[29] Animal histories have proliferated across the globe. There are animal histories of China, Japan, Russia, the Caribbean, Hawaii, Latin America, Burma, and Mexico, to name a few.[30] Much of the scholarship that has informed the rise of animal history comes from cultural and

[28] H. Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge: Harvard University Press, 1987).
[29] A. Skabelund, 'Animals and Imperialism: Recent Historiographical Trends', *History Compass* 11, 10 (2013), 801; J. Specht, 'Animal History after Its Triumph: Unexpected Animals, Evolutionary Approaches, and the Animal Lens', *History Compass* 14, 7 (2016), 326.
[30] M. Elvin, *The Retreat of the Elephants: An Environmental History of China* (New Haven: Yale University Press, 2006); R. Paddle, *The Last Tasmanian Tiger: The History and Extinction of the Thylacine* (Cambridge: Cambridge University Press, 2002); A. Skabelund, *Empire of Dogs: Canines, Japan, and the Making of the Modern Imperial World* (New York: Cornell University Press, 2011); J. Costlow and A. Nelson (eds.), *Other Animals: Beyond the Human in Russian Culture and History* (Pittsburgh: University of Pittsburgh Press, 2010); E. Melville, *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico* (Cambridge: Cambridge University Press, 1994); J. Fischer, *Cattle Colonialism: An Environmental History of the Conquest of California and Hawai'i* (Chapel Hill: University of North Carolina Press, 2015); J. McNeill, *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620–1914* (Cambridge: Cambridge University Press, 2010).

environmental history, and both fields have produced works that link animals and imperialism or animals and colonialism.[31] A wide range of themes and topics like breeding, zoos, modernisation, domestication, conservation, and hunting have been studied with some connections to a broader scholarship on animals and imperialism.[32]

Treating the theme of extinction, *The Last Tasmanian Tiger: The History and Extinction of the Thylacine* (2002) traces the extinction of *thylacine* (1936) and argues that human agency and nineteenth century scientific prejudices, as well as competition with farmers, eradicated the species.[33] Mark Elvin's *The Retreat of the Elephants: An Environmental History of China* (2006), traces the movement and habitations of elephants, and so uses elephants as a lens to gain new perspectives and insights into China's modernisation.[34] Aaron Skabelund examined how dog breeding and dog keeping practices and ideas spread in Japan via imperial influence.[35]

Mosquito Empires: Ecology and War in the Greater Caribbean, 1620–1914 (2010) shows how mosquitos and Yellow Fever definitively shaped imperial projects in the Caribbean, revealing that small insects could determine the probabilities of various imperial enterprises.[36] Mahesh Rangarajan has written sensitively about lion histories in the Gir forest and argues that different political regimes differently impacted the numbers and habitats of lions in India. Regarding how to interface with humans in these forests, he argued that lions in the forests most likely conferred insights intergenerationally.[37] John Fischer's *Cattle Colonialism: An Environmental History of the Conquest of California and Hawai'i* (2015) uses an environmental

[31] Skabelund, 'Animals and Imperialism', 801.
[32] M. Derry, *Bred for Perfection: Shorthorn Cattle, Collies, and Arabian Horses Since 1800* (Baltimore: Johns Hopkins University Press, 2003); E. Hart, 'From Field to Plate: The Colonial Livestock Trade and the Development of an American Economic Culture', *The William and Mary Quarterly* 73, 1 (2016), 107–140; T. Kaarlenkaski, '"Machine Milking Is More Manly than Hand Milking": Multispecies Agencies and Gendered Practices in Finnish Cattle Tending from the 1950s to the 1970s', *Animal Studies Journal* 7, 2 (2018), 76–102; N. Rothfels, *Savages and Beasts: The Birth of the Modern Zoo* (Baltimore: Johns Hopkins University Press, 2002); I. Miller, *The Nature of the Beasts: Empire and Exhibition at the Tokyo Imperial Zoo* (Berkley: University of California Press, 2013); A. Isenberg, *The Destruction of the Bison: An Environmental History, 1750-1920* (Cambridge: Cambridge University Press, 2001); J. Buhs, *The Fire Ant Wars: Nature, Science, and Public Policy in Twentieth-Century America* (Chicago: University of Chicago Press, 2004); J. Clutton-Brock, *A Natural History of Domesticated Mammals* (Cambridge: Cambridge University Press, 1999).
[33] Paddle, *The Last Tasmanian Tiger: The History and Extinction of the Thylacine*.
[34] Elvin, *The Retreat of the Elephants*.
[35] Skabelund, *Empire of Dogs*.
[36] McNeill, *Mosquito Empires*.
[37] M. Rangarajan, 'Animals with Rich Histories: The Case of the Lions of Gir Forest, Gujarat, India', *History and Theory* 52, 4 (2013), 109–27.

history approach, with cattle as an overarching theme, to show how the control of cattle trades enabled colonialism to take root, and also explores the cultural, environmental and economic effects surrounding this trade.[38] However, the living, feeling cattle are entirely absent from the analysis. *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico* (1994) presents a view of the conquest of Mexico as ecological imperialism, in which 'weeds, seeds, and disease' were key aspects of this conquest.[39] Sheep feature as carriers of disease and hence are disparagingly regarded as a plague. Often in animal histories such as these, the animals themselves are either largely absent or feature as abstractions. By contrast, my approach aims to shift animals from the object to the subject category and explore their historical experiences. This is the core difference between my approach and most animal histories.

There are also animal histories in southern Africa.[40] In an important historiographical discussion of animals in African history, Sandra Swart notes that in Africa animals have been included for 'several academic "generations"' in socio-environmental genres, literary studies, and among historians.[41] Some considered animals as subjects and agents but among historians animals have mostly featured as objects and abstractions. *Canis Africanis: A Dog History of Southern Africa* (2008), an edited volume, uses dogs as a theme to explore social and cultural history, and includes research on colonial control of dogs, Greyhound racing, representations of dogs in fiction, breeding, taxation, and registration.[42] There is also a relatively large literature which examines capitalist development, state and other interventions in rural and urban agriculture in southern African colonies, and in which the colonial control of cattle is variously explored.[43] This thesis expands on such scholarship by

[38] Fischer, *Cattle Colonialism*.
[39] Melville, *A Plague of Sheep*, 1.
[40] G. Mazarire, 'The Burrowed Earth: Rodents in Zimbabwe's Environmental History', *Critical African Studies* 8, 2 (2016), 109–35; I. Dande and S. Swart, 'History, Politics and Dogs in Zimbabwean Literature, c. 1975–2015', *Tydskrif Vir Letterkunde* 55, 3 (2018), 152–73.
[41] S. Swart, 'Animals in African History', in *Oxford Research Encyclopedia of African History* (Oxford University Press, 2019), 5; N. Jacobs, 'The Great Bophuthatswana Donkey Massacre: Discourse on the Ass and the Politics of Class and Grass', *American Historical Review* 106, 2 (2001), 485–507; N. Jacobs, *Birders of Africa: History of a Network* (London: Yale University Press, 2016); D. Wylie, *Death and Compassion: The Elephant in Southern African Literature* (Johannesburg: Wits University Press, 2018).
[42] L. van Sittert and S. Swart (eds.), *Canis Africanis: A Dog History of Southern Africa* (Leiden: Brill, 2008), vii–viii.
[43] W. Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock, and the Environment 1770-1950* (New York: Oxford University Press, 2003); M. Hubbard, 'Botswana's Beef Cattle Exports: Establishment of a Reserve Industry c.1900-1924', *Pula: Botswana Journal of African Studies* 3, 1 (1981), 47–57; P. Molosiwa,

focusing on the cattle themselves, and particularly how colonialism and development processes, including arms of colonial states, impacted cattle's histories and subjective experiences.

In *Wild by nature: North American Animals Confront Colonisation* (2017), Andrea Smalley set her focus on the 'colonization of American [wild] animals'.[44] Andrea Smalley casts wolves, beavers, bison, and fish as actors who interact with and resist and shape the nature of the processes of colonisation in British North America.[45] Andrea Smalley regards animals as beings who were also colonised in British North America and acted as obstacles to colonisation, so that lawmakers were compelled to shift colonisation tactics in processes that took centuries to resolve.[46] There have also been numerous edited volumes which have explored animal histories, including *Centering Animals in Latin American History* (2013), which purports to centre animals in historical scholarship.[47] Curiously, however, living, sentient animals are almost entirely absent from the volume.

There is also an important literature about animals as labourers. Jason Hribal was a pioneer of explicitly conceptualising animals as workers. Using a Marxist formulation, he argued that animals' roles in the development of capitalism should be recognised, that many animals performed work for human masters, and he rejected the assumption that labour is exclusive

'"The Tragedy of the Ababirwas": Cattle Herding, Power and the Socio-Environmental History of the Ethnic Identity of the Babirwa in Botswana, 1920 to the Present' (PhD Dissertation, University of Minnesota, Minnesota, 2013); W. Mwatwara and S. Swart, '"Better Breeds?" The Colonial State, Africans and the Cattle Quality Clause in Southern Rhodesia, c.1912–1930', *Journal of Southern African Studies* 42, 2 (2016), 333–50; C. Botha, 'The Emergence of Commercial Ranching under State Control and the Encapsulation of Pastoralism in African Reserves', in M. Bollig, M. Schnegg, and H-P. Wotzka (eds.), *Pastoralism in Africa: Past, Present and Future* (New York: Berghahn, 2013), 230–56; U. Dieckmann, 'Land, Boreholes and Fences: The Development of Commercial Livestock Farming in the Outjo District, Namibia', in M. Bollig, M. Schnegg, and H-P. Wotzka (eds.), *Pastoralism in Africa: Past, Present and Future* (New York: Berghahn, 2013), 257–88; P. Delius, *A Lion Amongst the Cattle: Reconstruction and Resistance in the Northern Transvaal* (Portsmouth: Heinemann, 1996); V. Machingaidze, 'The Development of Settler Capitalist Agriculture in Southern Rhodesia with Particular Reference to the Role of the State, 1908-1939' (PhD Dissertation, University of London, London, 1980).

[44] Smalley, *Wild by Nature*, 4.

[45] *Ibid.*

[46] *Ibid.*

[47] D. Brantz (ed.), *Beastly Natures: Animals, Humans, and the Study of History* (Charlottesville: University of Virginia Press, 2010); M. Few and Z. Tortorici (eds.), *Centering Animals in Latin American History* (Durham: Duke University Press, 2013); S. Nance (ed.), *The Historical Animal* (New York: Syracuse University Press, 2015); H. Kean and P. Howell (eds.), *The Routledge Companion to Animal-Human History* (New York: Routledge, 2019); P. Atkins (ed.), *Animal Cities: Beastly Urban Histories* (Surrey: Ashgate, 2012).

to humans.[48] He challenged labour historians to acknowledge animals as labourers. Since then, various scholars have conceived of animals as labourers, in two main ways. The first relates to the ethics of animal labour and the second to animal labour in capitalist development.[49] Ethical considerations of animal labour are premised on the bedrock claim that animal sentience implies that animals have inherent value. Sentience self-justifies moral status. On the basis of their intrinsic value, animals deserve legal protections (rights, in the deontological formulation) and/or moral consideration of their wellbeing (their interests, in the utilitarian formulation).[50]

Jocelyne Porcher and Tiphaine Schmitt studied 60 cows in a dairy operation and argued that the cows collaborated with farmers and robots, so that their compelled collaboration should be regarded as labour.[51] Jocelyne Porcher later argued that working animals are sentient beings who co-labour with humans, and sanguinely suggested the possibility of a multi-species collaborative labour utopia.[52] Rosemary Shaw argued that working animals should be afforded workplace protections by extending human health and safety legislation frameworks to include animals.[53]

A recent book on animals and labour studies called for inter-species solidarity, and a significant interdisciplinary edited volume explores whether animal labour is intrinsically oppressive or whether – for animals – there are possibilities for just and meaning-generating forms of labour.[54] Chapter Two of this thesis is an investigation into oxen's experiences as wagon-labourers in southern Africa from 1652 until the nineteenth century, and in this way contributes to animal labour history by connecting themes like colonialism and animal agency to cattle's labour experiences in southern Africa.

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[48] J. Hribal, '"Animals Are Part of the Working Class": A Challenge to Labor History', *Labor History* 44, 4 (2003), 435–53.
[49] An exception is L. Hamilton and N. Taylor, *Animals at Work: Identity, Politics and Culture in Work with Animals* (Leiden: Brill, 2013). This book relates to human identity and culture formation.
[50] Donaldson and Kymlicka, *Zoopolis: A Political Theory of Animal Rights*, 260.
[51] J. Porcher and T. Schmitt, 'Dairy Cows: Workers in the Shadows?', *Society & Animals* 20, 1 (2012), 39–60.
[52] J. Porcher, *The Ethics of Animal Labor: A Collaborative Utopia* (Basingstoke: Palgrave Macmillan, 2017).
[53] S. Rosemary, 'A Case for Recognizing the Rights of Animals as Workers', *Journal of Animal Ethics* 8, 2 (2018), 182–98.
[54] K. Coulter, *Animals, Work, and the Promise of Interspecies Solidarity* (Basingstoke: Palgrave Macmillan, 2016); C. Blattner, K. Coulter, and W. Kymlicka (eds.), *Animal Labour: A New Frontier of Interspecies Justice?* (Oxford: Oxford University Press, 2019).

Shifting from ethical considerations of animal labour, Dinesh Wadiwel explored chicken labour within themes of capitalism, resistance, and time.[55] Les Beldo usefully conceptualised chickens as performing 'metabolic labour' – where eating to become commodified flesh *is* labour – and argued that their labour should not be elided in studying capitalist production.[56] He offered an ethnographic description of the lives of 'broiler' chickens on a farm in rural Michigan.

Few historians have researched colonialism and animal labour. James Hevia's *Animal Labor and Colonial Warfare* (2018) studies the Second Afghan War and closes in the early twentieth century.[57] It is about British colonial bureaucracies and their war campaigns in which camels, mules, donkeys and horses were stolen, bred, or imported and then deployed in military campaigns and elsewhere as transporters. The book's title foregrounds the animal labour aspect but its contents reveal a lack of focus on the animals themselves and the types of labour they performed. These lacunae are not explained by a lack of suitable sources.[58] There are passing references to the animals experiencing suffering but these are mostly abstract, without detail, and unexplored.[59] He declines engagement with scholarship on animal labour within labour history and there are very few references to animal history.[60] The book is more about colonial campaigns than animal labour. Also focusing on colonial India, Heeral Chhabra has argued that labour history should include animals, and contended that analysing colonial legislation that 'mediated animal labour' enables explorations of animal labour in labour and colonial histories.[61] Among other things, my approach also connects animal labour history to colonial history, in that it recognises oxen's wagon labour as an impact of colonialism in southern Africa, and explores oxen's experiences of wagon labour. Having discussed a diverse animal history literature and literature on animal labour, the next section focuses on animal histories which have presented animals as subjects.

[55] D. Wadiwel, 'Chicken Harvesting Machine: Animal Labour, Resistance and the Time of Production', *South Atlantic Quarterly* 117, 3 (2018), 527, 534, 536, 541–43.
[56] L. Beldo, 'Metabolic Labor: Broiler Chickens and the Exploitation of Vitality', *Environmental Humanities* 9, 1 (2017), 108, 125.
[57] J. Hevia, *Animal Labour and Colonial Warfare* (Chicago: University of Chicago Press, 2018).
[58] *Ibid*, 41–42, 45.
[59] *Ibid*, 26, 31, 41, 43, 44, 45, 61, 85, 127, 148, 197, 262, 287.
[60] *Ibid*, 304–16.
[61] H. Chhabra, 'Animal Labourers and the Law in Colonial India', *South Asia Research* 39, 2 (2019), 166, 180.

Regrettably not yet translated from French to English, likely among the most sustained efforts to depict historical episodes from the perspective of feeling animal subjects is Éric Baratay's *Le Point de Vue Animal: Une Autre Version de l'histoire* (2012), *The Animal Perspective: Another Side of the Story*.[62] Éric Baratay writes that '[l]'animal vivant ne peut plus être un trou noir de l'histoire', the living animal can no longer be a black hole in history.[63] The book is an attempt to abandon an anthropocentric view of history. It focuses on the emotions, feelings, and reactions of animals, including cows in dairy industries, horses, bulls, and dogs in twentieth- and twenty-first century historical events.[64] Arguing that historians 'must make do with what we have' and drawing on archival material by veterinarians, miners, and engineers, and then reading these in light of insights from the sciences, including ethology, ecology, zoology, he claims that historians can *try* to take on their [an animal's] psychological viewpoint to see what they see and to feel what they feel'.[65] He argues that such history demands an empathetic approach towards animals.[66] In a similar way, written in Dutch, Guido van Hengel's *Roedel: een Alternatieve Geschiedenis van Yoegoslavië* (2021), *Pack: an Alternative History of Yugoslavia*, takes a sensory history approach to explore, via sights, noises, and smells, what life was like for street dogs during the Balkan war.[67]

Significantly, in English, there have been several important endeavours to write history about animals as subjects. Sandra Swart's *Riding High: Horses, Humans and History in South Africa* (2010) shows how horses laboured, were exploited, were 'a force in social change', and expressed agency in various ways.[68] She argues that including other species in history writing,

[62] É. Baratay, *Le Point de Vue Animal: Une Autre Version de l'histoire* [*The Animal Perspective: Another Side of the Story*] (Paris: Seuil, 2012).
[63] *Ibid*, 30.
[64] É. Baratay, translated by S. Posthumus 'Building an Animal History', in L. Mackenzie and S. Posthumus (eds.), *French Thinking about Animals* (Michigan: Michigan State University Press, 2015), 6–7.
[65] *Ibid*, 5–7.
[66] *Ibid*, 6; For the role of empathy in writing about animals see: J.M. Coetzee, *The Lives of Animals* (Princeton: Princeton University Press, 1997), 35; Nussbaum, *Frontiers of Justice: Disability, Nationality, Species Membership*, 345; and, E. Aaltola, *Varieties of Empathy: Moral Psychology and Animal Ethics* (Lanham: Rowman & Littlefield, 2018).
[67] G. van Hengel, *Roedel: Een Alternatieve Geschiedenis van Yoegoslavië* [*Pack: an Alternative History of Yugoslavia*] (Amsterdam: GA Van Oorschot, 2021).
[68] S. Swart, *Riding High: Horses, Humans and History in South Africa* (Johannesburg: Wits University Press, 2010), 202, 209, 212, 219.

not only adds to the story but 'changes it'.[69] For Sandra Swart, horses experience and contribute to history in their own biologically differentiated ways, and she argues carefully that animals deserve inclusion in the same way that other neglected groups (of humans) have deserved inclusion.[70] Sandra Swart's prolific and lively writing on animal history in southern Africa, in the form of narratives, theoretical contributions and historiographies, distinguishes her as a primary specialist on southern African animal history.[71] Her acknowledgement of animals as sentient subjects, her inclusion of the sensory aspects of horse history, and her use of a history from below approach to include animals marks her as an innovative pioneer in the literature.[72] My approach draws on Sandra Swart's in that cattle are positioned as sentient and sensory beings, whose histories deserve inclusion in their own right.

Jonathan Saha's scholarship on elephant labourers in colonial Burma is sophisticated and sensitive.[73] It is alert to the pitfalls of anthropocentrism, recognises animals as sentient, acknowledges their mental powers, and is alive to forms of animal resistance.[74] He recognised elephants as colonial labourers who felled trees, freighted timber and loaded it onto ships for export, and argued that their labour was both 'essential' and 'integral' to colonialism in Burma, specifically the colonial teak industry.[75] He writes that elephants

> were conscripted into the imperial project through force and violence. They were treated as meaty machines to be captured, trained, worked, bought, sold and experimented upon. At the same time they were essential, sentient coworkers.[76]

[69] *Ibid*, 197, 202.
[70] *Ibid*, 7, 197, 198–208; S. Swart, '"The World the Horses Made": A South African Case Study of Writing Animals into Social History', *International Review of Social History* 55, 2 (2010), 257.
[71] S. Swart, 'The Lion's Historian: Animal Histories from the South' (Inaugural Address, Stellenbosch University, 17 October 2017); Swart, 'Animals in African History'; S. Swart, 'Settler Stock? Animals and Power in Mid-Seventeenth Century Contact at the Cape, circa 1652-62', in P. Cuneo (ed.), *Animals and Early Modern Identity* (London: Routledge, 2016), 243–69; S. Swart, 'Beasts of the Southern World' (African Environments & Their Populations, Georgetown University, 23 April 2016).
[72] Swart, 'Animals in African History', 3; Swart, *Riding High: Horses, Humans and History in South Africa*, 197–208.
[73] J. Saha, 'Colonizing Elephants: Animal Agency, Undead Capital and Imperial Science in British Burma', *BJHS Themes* 2 (2017), 169–89; J. Saha, 'Milk to Mandalay: Dairy Consumption, Animal History and the Political Geography of Colonial Burma', *Journal of Historical Geography* 54 (2016), 1, 8–10.
[74] Saha, 'Colonizing Elephants', 170, 172, 179, 187.
[75] *Ibid*, 169.
[76] *Ibid*, 172.

Further, he demonstrated their agency in protestatory and resistance actions – elephants refused to work after the dinner time bell, and stuffed mud into the bells around their necks to move imperceptibly and take crops from local farmers.[77] On occasion, the elephants were tranquilised with opium, indicating a recognition that animals have brain hardware on which opiates act.[78] There are sensitive passages about elephants being 'broken in' as compelled labourers and their resistance punished by being burned with torches, and he notes that the elephants 'bore the physical scars of the training process throughout their lives'.[79]

Brett Walker's *Lost Wolves of Japan* (2009) sees wolves as co-participants in history, as *subjects* who act, rather than *objects* who are acted upon.[80] In terms of a wolf-perspective, Brett Walker drew on his own observations of wolves, psychology, biology, neurology and ethology to enrich our view of the Hokkaido wolves, wolves driven to extinction by bounties and traps as part of the Meiji restoration's shift to modernisation in the late nineteenth century.[81] My approach also draws on an interdisciplinary understanding of cattle as subjects, but as a way to centre cattle throughout the historical investigations. Brett Walker described wolves' social rituals, their tactics for group cohesion, their familial and social bonds, including 'close psychological bonds' between pairs of wolves.[82] He emphasised that wolves like other animals have limbic systems, neurotransmitters like epinephrine and oxytocin, and have the faculties for 'complex emotional lives'.[83] In this way, we can see the wolves more on their own terms, as co-competitors for resources with cattle ranchers, within their own wolf ecologies, and as '*a part of* colonial finance systems and not distinct from our modern order'.[84] *The Lost Wolves of Japan* shifts humans from the role of central actors and sees other animals as actors too, who also experience and are part of history in their own right.

Brett Walker's core methodological argument is that because we have known since Darwin that animals have emotions and experiences, it follows that historians ought to revise how

[77] *Ibid*, 170, 179.
[78] *Ibid,* 179.
[79] *Ibid*, 177, 178.
[80] Walker, *The Lost Wolves of Japan*.
[81] *Ibid*, 26, 32, 176, 177.
[82] *Ibid*, 195, 197.
[83] *Ibid*, 197, 198.
[84] *Ibid*, 194, emphasis added.

they write about animals, seeing them as more complexly and richly part of history, recognising them as having complex emotional lives, and thus – most importantly – relooking at our relationships with them.[85] Distinguished in that it makes an intentional attempt to view historical shifts from the wolves' perspective, shifting animals from the category object to the category subject, the book is something of an exception in the broader animal history literature, even if only two of the six chapters feature the living wolves.

There are other examples where animal subjectivity is treated historically, and their perspective is approximated. Jason Hribal's *Fear of the Animal Planet: The Hidden History of Animal Resistance* (2001), for example, is replete with examples of animals exercising agency historically, resisting their station, destroying tools, and otherwise making domestication difficult and in some cases impossible.[86] Jason Hribal shows that the way the institutions, training regimes and tools used to control animals all indicate that people who work with animals know full well that animals resist their station and wish to escape. My approach is similarly alert to instances of cattle resistance, which are framed as expressions of animal agency. Very recently Peter Braden's doctoral thesis used Actor-network Theory (ANT) to innovatively explore bovine experiences in the twentieth century Chinese civil war and revolution.[87] ANT as an approach for writing animal history is discussed later.

Outside of rare, exceptional counterexamples, animal histories in general tend to feature animals as lenses, or instrumentalities. The living, feeling, experiential subjects are mostly blanked out. Animal histories tend to double back to really be human histories which incidentally feature animals. In most cases, animals feature in histories *qua* a window through which to view and derive insight into essentially human concerns. In light of this common feature of animal histories, my approach was to instead pay attention to cattle's experiential capacities and use knowledge of these capacities to interpret historical sources in ways that enabled an exploration of cattle's historical experiences. Animal historians have often been, if not incurious about then at least unwilling, or, unequipped to more deeply explore animals'

[85] *Ibid*, 28–32.
[86] J. Hribal, *Fear of the Animal Planet: The Hidden History of Animal Resistance* (Oakland: Counter Punch Press and AK Press, 2011).
[87] P. Braden, 'Serve the People: Bovine Experiences in China's Civil War and Revolution, 1935-1961' (PhD Dissertation, University of California San Diego, San Diego, 2020).

subjective historical experiences in a sustained way. Save for some notable exceptions, what is lacking in the scholarship on animal history and colonialism is an analysis that gives sustained primary attention to the animals themselves. This is what I set out to do in this research. My project takes the lives of cattle seriously, conceiving of cattle as sentient indivisible individuals, with rich psychological and emotional lives of their own, centres of experience, somebodies not somethings, beings who possess a good towards which they strive, and who have rich kin and social relationships.

If animals are depicted as subjects, then arguably we ought to know something about animals' minds. One powerful conceptual tool for thinking about animals' minds, specifically those of mammals and birds, is Gay Bradshaw's theory of Trans-species psychology, which recognises that human and animal minds are different sides of the same coin.[88] Drawing on ethology, neuropsychology, neuroscience and psychiatry, Gay Bradshaw has developed an animal theory of mind which accounts for the fact of animal and human minds having more commonalities than differences, minds differing in degree and not in kind. The theory is born from psychological and psychoanalytical diagnoses of animals who have experienced trauma, such as elephant communities after culling episodes, and the neurological similarities between humans and animals, in particular mammals and birds. Most prominently, Bradshaw and other psychologists use this theory to explain Post-Traumatic Stress Disorder (PTSD) in elephants, chimpanzees, parrots and bears.[89] Once it is recognised that human and animal minds are more similar than different, historians can better interpret sources and write animal-centred histories. Gay Bradshaw notes that 'once occupying four conceptual quarters, mind, body, animal, and human are reintegrating into one.'[90] Gay Bradshaw offers an alternative to adding species to the 'holy trinity' of class, race, and gender.[91] The concept of mind underpins the concepts of race, class and gender. Thus, another approach might be to enrich and broaden our conceptions of mind so that our conscious cousins are included in a more elementary conceptual way. The suggestion here is that rather than adding the category

[88] Bradshaw, *Elephants on the Edge*, 16, 18, 23, 112, 186, 249.
[89] G. Bradshaw, T. Capaldo, and G. Grow, 'Building an Inner Sanctuary: Complex PTSD in Chimpanzees', *Journal of Trauma & Dissociation* 9, 1 (2008), 9–34.
[90] Bradshaw, *Elephants on the Edge*, 186.
[91] S. Swart, '"But Where's the Bloody Horse?": Textuality and Corporeality in the "Animal Turn"', *Journal of Literary Studies* 23, 3 (2007), 285.

'species' to the core categories of class, race, and gender, or land, labour, and class, we might expand the concept of mind, so that animals are included within the broader category 'mind'. This approach is implicit in the German name, *Geisteswissenschaften*, and Dutch name, *Geesteswetenschappen*, for what in anglophone universities is called the Humanities. The Dutch and German terms signify the broader category spirit/mind whereas anglophones narrow the focus onto humans. Within the genre of animal history which acknowledges animals as subjects, a core concept is animal agency. A theoretical engagement with the concept of animal agency follows, after which the thesis' methodology can be discussed.

Animal agency

Numerous historiographies and historians have discussed animal agency.[92] However, the concept of animal agency is still relatively under-theorised. Owing to its importance for an animal history that depicts animals as experiential subjects, the following section comprises a substantive theoretical discussion of animal agency. It sketches different views on animal agency and then offers a species-specific conception of agency developed by combining theories from political philosophy and philosophy of mind. In terms of the broader humanities and social sciences scholarship, conceptions of animal agency can be arranged into four broad categories, namely, a) post-humanists, b) deniers or those who think agency is severely limited, c) ignorers, and d) those who affirm that animals have agency.

Two major contributors to the conceptual development of animal agency are Donna Haraway and Bruno Latour, both deeply post-humanist in orientation.[93] In *A Cyborg Manifesto* (1991), Donna Haraway started to challenge the persistently strong human and animal dichotomy in the social sciences, and argued for kinship between humans, animals, and machines.[94] In *When Species Meet* (2008), Haraway went further, by arguing that human agency and animal

[92] A. Rees, 'Animal Agents? Historiography, Theory and the History of Science in the Anthropocene', *BJHS Themes* 2 (2017), 1–10; E. Domańska, 'Animal History', *History & Theory* 56, 2 (2017), 267–87; B. Walker, 'Animals and the Intimacy of History', *History & Theory* 52, 4 (2013), 45–67.
[93] For a good discussion and qualified defence of these authors and animal agency debates see C. Pearson, 'History and Animal Agencies', in L. Kalof (ed.), *The Oxford Handbook of Animal Studies* (New York: Oxford University Press, 2016), 240–57.
[94] D. Haraway, 'A Cyborg Manifesto', in D. Haraway (ed.), *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 149–81.

agencies co-constitute each other.[95] She argued that animals are 'actors' and challenged the notion that agency be understood in a human-exclusive way.[96] Donna Haraway noted rather that humans and animals have 'asymmetrical' agencies.[97]

Other scholars draw on Bruno Latour's development of ANT.[98] ANT is a highly influential approach, and various animal histories have drawn on it, which motivates my extended theoretical engagement with it. It is also the approach that contrasts most with my conception of species-specific agency. As Chris Pearson put it, for Bruno Latour nature and society are constituted and explained by a 'circulating hybrid collective of quasi-objects and quasi-subjects'.[99] In this view agency is distributed and miscellaneous, meaning that everything in the environment, including sand, rivers and trees, are ascribed agency. Everything plays a role (is an actor) in a matrix of relations (network) in co-constituting society and nature. Agency is not only extended to include conscious animals but *everything*, implying that in ANT a grain of sand possesses agency. While ANT did well to challenge the late twentieth century orthodox view that humans uniquely possessed agency, it met criticisms of vagueness and a lack of explanatory power.[100] Like Donna Haraway and Cary Wolfe, Bruno Latour does not appear to place a premium on clarity and being publicly understandable, preferring a poetic, meandering style over a crystalline one.[101] Sometimes the writing, especially of the latter two, is positively obscure. Others have worried that ANT overstates the agency of things and animals at the expense of humans' role and the powers of capitalism.[102]

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[95] D. Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2008), 27, 71, 134, 208, 220, 344, 383.
[96] *Ibid*, 25, 26, 134, 136.
[97] *Ibid*, 262.
[98] B. Latour, translated by C. Porter, *We Have Never Been Modern* (Cambridge: Harvard University Press, 1993); B. Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2007); D. Shaw, 'The Torturer's Horse: Agency and Animals in History', *History and Theory* 52, 4 (2013), 146–67; C. Pearson, 'Dogs, History, and Agency', *History and Theory* 52, 4 (2013), 128–45; E. Sayes, 'Actor-Network Theory and Methodology: Just What Does It Mean to Say That Nonhumans Have Agency?', *Social Studies of Science* 44, 1 (2014), 134–49.
[99] Pearson, 'History and Animal Agencies', 244.
[100] B. Carter and N. Charles, 'Animals, Agency and Resistance', *Journal for the Theory of Social Behaviour* 43, 3 (2013), 323–25, 328.
[101] Latour, *Reassembling the Social*, *passim*; C. Wolfe, *What Is Posthumanism?* (Minneapolis: University of Minnesota Press, 2010), *passim*.
[102] N. Castree, 'False Antitheses? Marxism, Nature and Actor-Networks', *Antipode* 34, 1 (2002), 111–46.

My concern with ANT also relates to explanatory power. The feeling, experiencing beings seem to vanish into a matrix of dispersed, inscrutable causal relations. While ANT did well as a lens through which to see that humans are ineluctably embroiled in relationships with nature, the environment, objects, and animals, the theory deflates the concept of agency by ascribing it to everything, including immobile insensate objects like grains of sand. There is a real sense in which if everything has agency then nothing has agency. In this way, ANT risks doubling back to again placing animals in the object category, via under-appreciating their subjective capacities, their interiority and the richness of their experiences and strivings. Some historians, however, have written animal histories within an ANT framework while recognising that animals are conscious and intentional.[103]

Some scholars appear to deny that animals have agency altogether or claim that their agency is severely limited. In *Rule of Experts, Egypt, Techno-politics, Modernity* (2002), Timothy Mitchell studies mid-twentieth century Egypt and paints a picture of human agency operating in unavoidable relationships with 'forces' of disease, nature, chemistry, hydraulics, war, technology and others.[104] Conceived this way, Timothy Mitchell sees human acts not as 'calculating interests directing social outcomes' but 'more as the product of a series of alliances in which the human element is never wholly in control', such that human 'agency and intention are partial and incomplete products' of interactions with processes, nature, and technology.[105] Humans and animals both lack meaningful agency in this view, in that their choices are severely limited by external factors, a view which I return to below.[106] Some, like historian William Sewell, reject animal agency on the basis of a view that animals lack the capacities for consciousness, intention, and judgement.[107] Linda Nash is also critical of human and animal agency, although she stops short of accepting environmental determinism, and instead suggests that notions of agency should be 'critically foreground[ed]'.[108]

[103] Shaw, 'The Torturer's Horse'; Pearson, 'Dogs, History, and Agency'; Braden, 'Serve the People', 8, 9, 17, 28, 89, 224, 309–310, 322.
[104] T. Mitchell, *Rule of Experts: Techno-Politics, Modernity* (Berkeley: University of California Press, 2002), 10.
[105] *Ibid*, 10, 34.
[106] *Ibid*, 34.
[107] See Pearson, 'History and Animal Agencies', 247.
[108] L. Nash, 'The Agency of Nature or the Nature of Agency?', *Environmental History* 10, 1 (2005), 68.

Since animals lack human language, philosopher Ralf Stoecker denies that animals can participate in public deliberation, and infers that animals cannot be social agents, literally cannot act.[109] To say that animals lack agency because they lack language is really to say that animals lack human linguistic agency because they lack human language. That animals lack human language is true, but that animals lack language or modes of conspecific and inter species communication, that animals do not communicate in their own characteristic or species-specific modes, is false.[110] There is no reason a uniquely human feature such as human language should be a *necessary* feature of a conception of agency that applies to human, *and all other animal species.* The weight of empirical evidence collated in Eva Meijer's *Animal Languages* (2020) is simply too strong to deny that animals have languages and meaningful modes of communication of their own.[111] Further, pioneering animal linguists Leonie Cornips and Louis van der Henger are building theoretical bases for a cattle linguistics, which recognise cattle's 'cognitive, emotional and social intelligence'.[112]

Scholars here conceived of as down-players of animal agency argue that animal history has triumphed and that scholars have convinced mainstream historians that animals possess agency.[113] In this view, animal agency should be a starting point, not a preoccupation and a conclusion to a study. Joshua Specht, while taking animal agency as a given, has two issues with a preoccupation with animal agency.[114] The first is that it conceives of the agent as disaggregated from the broader historical process, and the second is that a focus on animal agency risks neglecting the powerful structures and processes in which beings are embedded and which constrain their agency. We return to these concerns later.

[109] R. Stoecker, 'Why Animals Can't Act', *Inquiry: An Interdisciplinary Journal of Philosophy* 52, 3 (2009), 255.
[110] E. Meijer, *When Animals Speak, toward an Interspecies Democracy* (New York: New York University Press, 2019).
[111] E. Meijer, translated by L. Watkinson, *Animal Languages* (Cambridge: MIT Press, 2020).
[112] L. Cornips and L. van der Henger, 'Place-Making by Cows in an Intensive Dairy Farm: A Sociolinguistic Approach to Nonhuman Animal Agency', in B. Bovenkerk and J. Keulartz (eds.), *Animals in Our Midst: The Challenges of Co-Existing with Animals in the Anthropocene* (Cham: Springer, 2021), 177.
[113] Specht, 'Animal History after Its Triumph', 332.
[114] *Ibid*.

There are simply too many historical and contemporary accounts of animals expressing agency available to allow an outright denial of animal agency.[115] That, and the increasing scientific evidence of animals' brain hardware, makes a denial of animal agency implausible. Or as Jason Hribal and Sandra Swart and others have pointed out, farmers who have worked with animals did not doubt that animals were active actors, in terms of their daily interactions with animals, and also as the tools and methods and structures with which they interact with animals indicate.[116]

One challenge for those working with the concept of animal agency in historical investigations is that historians have not spelt out analytically what the *features* of animal agency might be. For example, Jason Hribal, an English-speaking author who has likely devoted the most attention to demonstrating animal agency historically, defines agency as 'the minorities' ability to influence their own lives — i.e., the ability of the cow to influence and guide her own life', while Joshua Specht defines animal agency as 'the ability to shape in meaningful ways the world around them'.[117] But such definitions do not say *why* or *how* animals can possess agency. I aim to enumerate core features of a more developed, species-specific conception of animal agency. Another way of conceptualising agency would link agency to the presence of a mind. That is, agency is conceptualised as mind-based. This conception of animal agency integrates current neuroscientific evidence of animals' minds.[118] While many species of animals' minds are scientifically regarded as a given, this knowledge has been insufficiently appreciated in debates about animals' agency and in how historians conceive of animals.

What some denials of animal agency have in common is that a) they do not engage the empirical neuroscientific evidence on animal minds and behaviours, and b) they define agency in a human-exclusive way and based on that definition deny that animals possess agency. Thus, these views on animal agency lack empirical backing, and reject animal agency by

[115] S. McFarland and R. Hediger (eds.), *Animals and Agency: An Interdisciplinary Exploration* (Leiden: Brill, 2009); T. Räsänen and T. Syrjämaa (eds.), *Shared Lives of Humans and Animals: Animal Agency in the Global North* (New York: Routledge, 2017).
[116] Swart, *Riding High: Horses, Humans and History in South Africa*, 202; J. Hribal, 'Animals, Agency, and Class: Writing the History of Animals from Below', *Human Ecology Review* 14, 1 (2007), 101–12; Glover, 'A Cattle-Centred History of Southern Africa?', 35.
[117] Hribal, 'Animals, Agency, and Class', 102; Specht, 'Animal History after Its Triumph', 232.
[118] DeGrazia, 'Sentience and Consciousness', 21–28.

definitional caveat. They do not offer compelling grounds for denying that animals possess their own species-specific agency. They fail – to borrow phraseology from Vinciane Despret – to take an interest in animals on their 'own terms'.[119] In respect of William Sewell's view that animals lack consciousness, intentionality, and judgement,[120] we have seen that the premise that animals lack consciousness is empirically false. Further, we can deny that animals lack intentionality and judgement, by affirming that a) animals lack *human* intentionality and judgement but still b) possess *species-specific* intentionality and judgement.

When we speak of a concept like animal agency, we must bear in mind that we may be seeking to use a single concept to signify the at least 1.5 million named species of animals.[121] Upper estimates suggest the number of animal species may be as high as 7.7 million.[122] If we assumed that the lower number of 1.5 million animal species is correct, and that each species' name comprised one word, and that a book's length is 80 000 words, it would take 18.75 books to name each species of animal.

Faced with such extreme conceptual broadness, the proposition that we define the features of agency based on the features of *one* species, namely humans, and then use those features to potentially deny agency to over a million other species appears wrongheaded. It appears wrongheaded because it forecloses explorations of how millions of other species might possess and express agency, and elides the empirical fact of many animal species' minds. Features such as human rationality, human intentionality, human free will, human calculation, human language, human-species-membership and human self-reflexivity illegitimately claim agency as human-exclusive by definition.

Philosopher Martha Nussbaum defends a *species-specific* conception of animal flourishing.[123] Drawing on an Aristotelian tradition of *eudaimonia* – i.e., flourishing, or living excellently, or the good life – Martha Nussbaum defends the view that each animal pursues and seeks to

[119] V. Despret, translated by B. Buchanan, *What Would Animals Say If We Asked the Right Questions* (Minneapolis: University of Minnesota Press, 2016), 92.
[120] See Pearson, 'History and Animal Agencies', 247.
[121] R. May, 'How Many Species Are There on Earth?', *Science* 241, 4872 (1988), 1447.
[122] C. Mora *et al*., 'How Many Species Are There on Earth and in the Ocean?', *PLOS Biology* 9, 8 (2011), 2.
[123] Nussbaum, *Frontiers of Justice: Disability, Nationality, Species Membership*, 94, 326, 327, 337, 351, 356, 60, 365, 382, 383, 392.

pursue their good. Under suitable enabling conditions, animals, like humans, pursue their own flourishing, they strive in their species-characteristic ways towards *eudaimonia*. This coheres well with observations of animals – each striving to live excellently, to flourish, in their own species-characteristic ways. A crow pursues her good by building a nest, in the same way that a cow pursues her good by grooming her calf: very different activities but both eudaimonic.

Interestingly, a species-specific conception of flourishing implies a species-specific conception of agency, in that agency would typically have to be connected to the characteristics and capabilities of the animals within a species. Drawing on the work of philosopher Hans-Johan Glock, and combining it with Martha Nussbaum's conception of species-specific flourishing, we can define species-specific animal agency as requiring the following features.

Features of species-specific animal agency reasonably include: a) possessing sentience, i.e., having *felt* experiences of the world, positive or negative affect or feelings, b) having perceptions and hence beliefs about their environment, i.e., cognitive states, c) having conation, i.e., intention or desire, d) acting subjectively in response to beliefs, and e) striving towards a species-characteristic good (*eudaimonia*).[124] Agency in this formulation is thus more than just sentience or the possession of a mind but is combined with a pursuance of flourishing.[125] Agency has a mind aspect and a eudaimonic aspect.

Feature a) is sufficient and necessary for agency, features a) to d) are necessary for agency, and feature e) is necessary but not sufficient for agency. Features b) to d) are really sub-or-implied features of the primary overarching feature, namely a) sentience.[126] To be sentient is to have feelings, perceptions and beliefs, to have intention, and typically to be able to act subjectively in response to beliefs. Plants might be said to strive towards their species good – by growing towards sunlight, for instance – but plants are insentient, do not possess features a) to d), and so do not possess agency in this view.

[124] H-J. Glock, 'Agency, Intelligence and Reasons in Animals', *Philosophy* 94, 4 (2019), 1, 4–7, 20, 23–24.
[125] Nussbaum, *Frontiers of Justice: Disability, Nationality, Species Membership*, 94.
[126] For a distinction between consciousness and sentience, see DeGrazia, 'Sentience and Consciousness', 17–18.

A species-specific conception of agency can thus be defined as that which is possessed by a being of a particular species who possesses sentience, has perceptions and beliefs, has desires and intentions on the basis of the perception-derived beliefs, and who enacts their agency in response to those beliefs, towards the goal of their species-specific flourishing.[127] Agency thus goes beyond mere possession of sentience, but includes acting in ways that are based on ones' species-specific capacities, and includes the activities one undertakes in pursuance of one's flourishing. Agency is a combination of a set of capacities and enactments. An animal in a cage has the capacities for agency but is unable to enact her agency. The structure restricts her agency. To be an agent is to have sentience and strive in a species-characteristic way towards a species-characteristic good. Mammals, birds, fish, cephalopods, reptiles, and many insects qualify for this mind-based, species-specific form of agency.[128] When I use the term animal agency from here on, I refer to this species-specific formulation of agency.

This conception of animal agency has six merits. First, it avoids diluting the concept of agency to such an extent that agency lacks meaning, in the way that ANT has ascribed agency to *everything*. Second, by including a species-specific sensitivity to biological discrepancies, and connecting these to core general features of agency such as sentience and striving towards species-characteristic goods, this definition is not human-exclusive and includes forms of non-linguistic agency that intellectually disabled persons and children, for example, possess.[129] Children's agency, once hardly considered, in the same way that colonised humans' agency was once not recognised or women's agency was not recognised, is now recognised in

[127] Glock, 'Agency, Intelligence and Reasons in Animals', 7; Nussbaum, *Frontiers of Justice: Disability, Nationality, Species Membership*, 392.
[128] DeGrazia, 'Sentience and Consciousness'; T. Birkhead, *Bird Sense: What It's Like to Be a Bird* (London: Bloomsbury Publishing, 2012); C. Brown, 'Fish Pain: An Inconvenient Truth', *Animal Sentience: An Interdisciplinary Journal on Animal Feeling* 1, 3 (2016), 1–5; A. van Huis, 'Welfare of Farmed Insects', *Journal of Insects as Food and Feed* 5, 3 (2019), 159–62; J. Lockwood, 'The Moral Standing of Insects and the Ethics of Extinction', *Florida Entomologist* 70, 1 (1987), 70–89.
[129] There is also the option to make this theory more granular and specific to the different capacities of individuals within a species. A cow with severe arthritis would have different strivings and goods than a cow without arthritis, for example – and so the conditions for enabling agency would be different, also.

provisions of recent United Nations conventions.[130] Historians have also begun to explore children's agency.[131]

Third, this conception of agency is theoretically and empirically compatible with social history-inspired conceptions of animal agency where resistance is an expression of agency. In pursuing their good, animals may resist the human order, for example by downing tools or by disobedience, which plausibly counts as species-specific expressions of agency and resistance. Fourth, unlike ANT this conception of agency links agency to a mind, rather than to an item in a highly dispersed causal network chain/assortment, such as sand, and is thus principally about subjects and their navigation of structures and processes. This connects to Joshua Specht's concern that a preoccupation with agency draws attention away from processes and structure. Plausibly, a preoccupation with animal agency can investigate processes and structures in the most interesting and important way – namely in terms of how they impact and are experienced by sentient beings.

Fifth, this species-specific conception of agency can interpret animals' behaviours in terms of exercising agency in pursuance of their good. Oxen labourers who run away from their masters during wagon journeys, for example, express their agency by pursuing their good, namely their not pulling wagons for their masters. Finally, sixth, this conception of agency is compatible with views that deny that any beings, human or otherwise, can act with free will or autonomy, where free will and autonomy are synonymous with agency. It is compatible with free will scepticism. So, whether the being is metaphysically free to pursue their good, has agency, in the sense of having free will-grade autonomy, has no bearing on whether that animal acts in a species-characteristic way in pursuing their good, namely whether that being has species-specific agency. Hard determinism can be true, all beings can lack metaphysical free will, but that does not mean that the beings do not have agency. Because even if one is metaphysically determined one can still be sentient and strive towards flourishing. Lastly, this conception of agency has normative content, in that fair and good treatment of animals

[130] S. Donaldson, and W. Kymlicka, 'Animals in Political Theory', in L. Kalof (ed.), *The Oxford Handbook of Animal Studies* (New York: Oxford University Press, 2017), 52.
[131] J. McDonald, '"We Do Not Know Who Painted Our Pictures": Child Transfers and Cultural Genocide in the Destruction of Cape San Societies along the Cape Colony's North-Eastern Frontier, c.1770–1830', *Journal of Genocide Research* 18, 4 (2016), 519–38.

would consist in recognising their agency and enabling them to enact their agency, i.e., enable the conditions for them to pursue their flourishing.

To be explicit, this is not a conception of agency where the subject is a distinctly free acting, autonomous agent, driven by rational inference, and powerfully shaping the world with their individual agency.[132] Thus, this conception of agency is compatible with Timothy Mitchell's common sense finding that humans are never wholly in control. If there is greater clarity on the concept of animal agency, positions in the debate can become clarified. With the historiography behind us, and having clarified this thesis' conception of animal agency, I now turn to the project's methodology.

Methodology

From the above historiography, various methodological implications for historians emerge. Importantly, histories that include or incorporate an animal perspective are rare but possible. Next, such histories compel historians to work across disciplines. Brett Walker's conceptions and discussions of wolves as subjects and co-participants are compelling because he draws on insights from psychology, neurology, ecology, and biology for example. His wolf-perspective is impossible if it is not interdisciplinary. As Éric Bartay put it, to 'build an animal history, history needs the help of other sciences.'[133] Further, when thinking about history from an animal or species' perspective, periodisation must relate to the animals' view in the same way that periodisation in orthodox (human) histories relates to humans. Cattle periodisation does not necessarily equal human periodisation.

There are six core aspects to this thesis' methodology. One, there is an attempt to situate cattle at the centre of analysis. Two, cattle are presented as experiential subjects. Three, agency is conceptualised as sentient, conative striving towards a species-specific good. Four, there is a sustained effort to explore cattle's experiences of impacts of colonialism. Five, the geographical lens is regional. Six, cattle' experiences are approached in an interdisciplinary

[132] Compare this to concerns raised by Swart, '"The World the Horses Made"', 251, and Skabelund, 'Animals and Imperialism', 803.
[133] Baratay, 'Building an Animal History', 5.

way, via reading archival and historical materials in light of scientific insights into cattle's subjective capacities.

Cattle often feature in southern African archival and historical material in indirect and oblique ways, but they are mentioned often. In censuses from the late nineteenth century cattle numbers were recorded. During the rinderpest epidemic in the late nineteenth century, the Cape Colony produced reports, debated the concerns in parliament, local officials corresponded on the effects of rinderpest in their region, and the Boer republics, British colonies and protectorates, and the British South Africa Company administration in the region met to devise response strategies.[134] Cattle also featured in legislation governing such things as branding and registration, or reports on vaccinations, export and imports, and veterinary protocols.[135] Agricultural reports in the twentieth century recorded cattle numbers, they indicated diseases that afflicted cattle and the state's responses to these. How many cattle, or kilograms of cattle flesh, were imported or exported were also recorded. Also, state projects, such as 'livestock improvement schemes' and breeding programmes were keenly preoccupied with cattle.[136] Certainly, cattle are mostly represented in the archives as abstractions, numbers, or instrumentalised economic units. These representations are read 'against the grain', they are not read in the way the colonial records intended them to be read.[137] These representations of cattle are read with an eye to centring cattle in an historical analysis. Faced with the challenge of cattle's experiences being excluded in archival representations, I conducted fieldwork among cattle, to try to learn about them and their ways of being, so that I could better interpret historical sources.

My commitment to wanting to understand the subjective aspect of cattle runs deep. For this thesis, I undertook fieldwork with a free-roaming herd of 17 uncommercialised Nguni cattle, on a private nature reserve in Matjiesfontein, in the Karoo, South Africa. In the spring of 2019, I spent 30 consecutive days following this matrilineal herd, at all different times of the day and night. Often the days were very hot; frequently exceeding 32 degrees Celsius. There were

[134] See Chapter Three.
[135] See Chapter Three.
[136] See Chapter Five.
[137] For an example of the against the grain approach see D. Lewis, 'Against the Grain: Black Women and Sexuality', *Agenda: Empowering Women for Gender Equality* 63, 2 (2005), 11-24.

only three water points, each about seven kilometres apart, meaning that the herd's grazing operations were always mediated by their proximity to water. During the days they mostly rested, and then walked and grazed at night, when it was cooler. It was the sixth year of drought in the area, and the herd had to walk many kilometres to find enough plants to eat. One experienced leader mostly led these missions away from water sources and towards desired plants. I documented them eating at least 17 different types of plants. I took over a thousand photographs of them, made dozens of voice notes to record my observations, and captured many hours of video footage of them. I watched juveniles being socialised, I watched social relations being maintained via grooming, grazing, sleeping, and lying together. I saw and photographed calves being acculturated into the hierarchies with nudges and horn bumps. One night I followed the herd through the night on a 14-kilometre walk to meet a newborn calf. That night I slept among the cows in their protective circular formation, myself and the calves in the middle, the adult cows facing outwards and forming the circle. Their smell was comforting to me in the darkness. In darkness I stayed close to them as we walked, using hearing and smell.

My perception of cattle changed profoundly after this month. I became convinced that cattle have culture which they pass on to younger generations. I came to learn that they are thoroughly social beings with many rich modes of communication and strong relationships. I learned that cattle are conflict avoidant. To navigate the harsh Karoo landscape as a herd, in scorching heat with limited water, requires strong social cohesion and keen intelligence. Life for them is difficult, even though they are not commercialised in any way. The fieldwork component of my research has informed my understanding of cattle's lives, culture, and behaviour. Because I had spent time observing and being among them, my fieldwork helped me to interpret historical sources about cattle, although it is not strictly part of the thesis' methodology.

Some historical material, such as the Society for the Prevention of Cruelty to Animals' (SPCA's) investigations into slaughterhouses, or travellers' accounts of oxen's wagon labour, provide notably rich descriptions of what cattle endured historically.[138] As Éric Baratay argues,

[138] See Chapter Two and Chapter Four, for example.

although most historical sources about European peasants were written 'by people with the social prestige of the ruling class… this has not kept historians from using them to write about rural history'.[139] He argues that, regarding animal history, the 'difficulty is obviously greater but not radically different.'[140]

So archival material empirically informs the historical narratives, but mostly does not give cattle's perspectives. It does not itself give direct insight into how cattle experienced colonialism. However, by studying animal disease epidemics, colonial laws and policies, veterinary projects, industrial and transport infrastructure, and breeding regimes, all of which shaped the experiences of cattle, and coupling this with an interdisciplinary understanding of cattle as experiential subjects, plausible inferences about shifts in cattle's experiences can be drawn.

Archival material does not generally give the perspectives of cattle directly. There are at least two senses of the word *perspective*. The first is the literal sense of perspective, which refers to the taste and smell aspects of experience, the visual and auditory planes, the pleasure and pain valences, the interior emotional world. To write from cattle's perspective, in this sense, would be to inhabit the emotional and sensory faculties of cattle. To write as if one were a cow or a bull, say.

In terms of knowing what it's like to be an animal, philosopher Thomas Nagel in a paper entitled 'What is it Like to be a Bat?' concluded that we cannot say that we know what it is like to be a bat, we can only say that we know what it is like for *us* to be a bat, *not* what it is like for *a bat to be a bat*.[141] Likewise, to be sure, we cannot know *entirely* what it is like for cattle to be cattle.[142] But no human can *fully* grasp the experiences of another human, never mind the experiences of a vastly different human, from a different society, class, gender, geography, and historical era. In thinking of animals' experiences, we should avoid a species solipsism, which denies that we can meaningfully comprehend the experiences of other

[139] Baratay, 'Building an Animal History', 6.
[140] *Ibid*.
[141] T. Nagel, 'What Is It Like to Be a Bat?', *The Philosophical Review* 83, 4 (1974), 439.
[142] E. Fudge, 'What Was It Like to Be a Cow? History and Animal Studies', in L. Kalof (ed.), *The Oxford Handbook of Animal Studies* (Oxford: Oxford University Press, 2017), 266.

species. In short, while we cannot perfectly access the experiences of others, we can still do the best we can with the resources we have.

Various serious attempts have been made to understand animals' experiences. Ornithologist Tim Birkhead in *Bird Sense: What it's like to be a bird* (2012) investigates bird experiences by drawing on ornithological research and using each chapter to approach an aspect of bird experience: sight, hearing, touch, taste, smell, emotions.[143] Similarly, psychologists, psychiatrists, psychoanalysts and neurologists have investigated fish, elephants, chimpanzees, parrots, and pigs' experiences, for example.[144] A recent survey of emotional, cognitive and behavioural research on cattle combines the available knowledge from animal scientists, animal behavioural scientists, developmental psychology, veterinary science, dairy science, and physiology, for example, to give a sense of cattle's 'cow psychology'.[145]

Perhaps the most innovative recent efforts to approach animals' perspectives via fieldwork is Charles Foster's *Being a Beast* (2016).[146] Charles Foster divides the book into five parts, or 'five universes', each corresponding to an animal species: badgers, otters, foxes, red deer, and swifts. To approach the perspectives of badgers Charles Foster, for example, spent about six weeks underground and ate worms.[147] By inserting himself – bodily, sensorily, and also imaginatively – into different animals' lived contexts, he endeavoured to approximate some of their perspectives, which marks the book as a major contribution in the drive to acknowledge and value animals' characteristic experiences, and move beyond anthropocentrism.

To approximate a cattle perspective in the literal sense, then, is to be cognisant of their capabilities and characteristics by drawing on disciplines like animal science, physiology, neuroscience, veterinary science, zoology, animal behaviourism, and animal welfare science, and to make scientifically informed inferences about cattle experiences of certain recorded

[143] Birkhead, *Bird Sense*.
[144] Balcombe, *What a Fish Knows*; Bradshaw, Capaldo, and Grow, 'Building an Inner Sanctuary'; Bradshaw, *Elephants on the Edge*.
[145] Marino and Allen, 'The Psychology of Cows.'
[146] C. Foster, *Being a Beast* (Suffolk: Profile Books, 2016).
[147] *Ibid*, xv, 23.

historical events and shifts. This move coheres with methodological inferences drawn by numerous animal historians and scholars.[148]

In terms of the other sense of cattle perspective, the non-literal sense, what is meant is that cattle are placed at the centre of analysis, cattle are investigated historically for their own sake. Cattle are used as an organising lens. As this thesis will show, when the focus is shifted to cattle, and colonialism is analysed, different themes and insights emerge. For example, disease epidemics like bovine pleuropneumonia and rinderpest are seen as not only afflicting people and deepening colonialism for people, but are viewed as profoundly affecting cattle societies and cattle history, also.[149] Likewise, technological advances like refrigerated shipping, rail carts and storage facilities reconfigured the lives of cattle dramatically.[150] For cattle, the South African War (1899-1902) and the gold and diamond mining boom in South Africa saw huge sums of capital injected into animal flesh industries and spurred forward processes like centralised, industrial slaughterhouses.[151] These changes implied real experiential shifts for cattle. This methodological approach allows one to see that colonialism is not only a process that affects humans, but also affects other sentient beings.

In a way, this methodological approach, namely placing cattle at the centre of analysis, is like approaches that focus on a commodity such as cotton to understand empires and global trade.[152] Cattle as a conceptual category are used as a lens to understand colonialism, but *how* cattle experienced colonialism is what makes this history different from a history of cotton, for example. So, while cattle are used as a lens they are not seen as objects, in the way that a cotton history of empire correctly sees cotton as an object.

This historical investigation looks at major impacts of colonialism on cattle in the late nineteenth and twentieth centuries from a regional rather than a national or local perspective. Its geographical scope includes what is present-day Botswana, Eswatini, South

[148] Domańska, 'Animal History', 277; Rees, 'Animal Agents?', 4–6; Baratay, 'Building an Animal History', 5.
[149] This approach differs from that of C. van Onselen, 'Reactions to Rinderpest in Southern Africa 1896-97', *The Journal of African History* 13, 3 (1972), 484. Also, see Chapter Three.
[150] See Chapter Four.
[151] See Chapter Four.
[152] S. Beckert, *Empire of Cotton* (London: Penguin Books, 2014).

Africa, Lesotho, Zimbabwe, and Namibia (see Images I.1 to I.3). There are three main reasons to use a regional rather than a national or local lens when studying cattle historically. Such a regional history, as Sven Beckert argues in respect of transnational histories generally, is one in which 'a whole range of connections that transcend politically bounded territories… connect various parts of the world to one another.'[153]

The first is that focusing on connections and similarities across a region brings local and national histories across state boundaries into conversation with each other and allows broader patterns to emerge. This approach links scholarship that has discrete national foci. It connects rather than isolates histories in the region. Second, except for Namibia, what is common to the countries included in this research – namely Zimbabwe, Botswana, Eswatini, Lesotho, and South Africa – is that all were colonised by the British during the nineteenth or early twentieth centuries.[154] Case studies of major events connected to colonialism and cattle in the region can show similarities, variations or discontinuities for the animals under colonial rule. Themes like wagon labour, disease epidemics, industrial slaughter, and breeding regimes intersect the region in ways that make it preferable to consider cattle regionally. Like ideas, diseases, and technologies do not respect human political borders.[155] Third, before colonialism in southern Africa, cattle and the human communities with whom they lived did not have their movement restricted by state borders. Many southern Africans were cattle keepers in some respect. This is the core similarity across the region: cattle were utterly central to many southern African societies. Fourth, cattle were traded and moved across borders via cattle trading networks in southern Africa for the entire period this study examines.

How might a cattle-centred history be periodised? In 2013 the world's first animal-centred museum exhibition, *The Museum of the History of Cattle*, exhibited in Helsinki. After living on earth for ten millennia, serving their human masters in myriad ways, cattle finally had their

[153] C. A Bayly *et al*., 'AHR Conversation: On Transnational History', *American Historical Review* 111, 5 (2006), 1446.
[154] The Orange Free State and the Transvaal Republic were initially controlled by the Afrikaners in present-day South Africa, although these areas were taken by the British after the South African War. What is today Namibia was given to the Germans in 1884 at the Berlin Conference and in 1920 was taken over by South Africa.
[155] T. Ballantyne, 'Mobility, Empire, Colonisation', *History Australia* 11, 2 (2014), 26, 36.

own museum. The researchers and creators of the museum, visual artist Terike Haapoja and novelist and playwright Laura Gustafsson marketed the exhibition on its website in the following terms:

> For thousands of years history has been written from the perspective of a small minority, humans. Still, the world has always been shared by numerous species. For the first time in history a non-human form of life will have their own museum, an institution that makes their experience of this shared reality visible.[156]

The creators were thus faced with the same challenge: how to offer a periodisation that is cattle-centred? Laura Gustafsson and Terike Haapoja published a cattle history to accompany the museum exhibition, *History According to Cattle* (2015).[157] Written from a first-person cattle perspective, and, so to speak, in cattle's narrative voice, the short cattle history is likely the sole history written from cattle's literal perspective. A plaque in the museum confronts the striking dilemma of imagining and then casting the history of cattle in human language.

> The language used in the Museum of the History of Cattle is borrowed from humans, and is the same as that in which they write their own history. The cattle tongue is not a written language. In cattle culture, the tongue is a means of touching others.[158]

Cattle cannot be expected to literally write their histories in human language. But that does not imply that cattle do not experience and shape history. So, getting to the crux of how a cattle history can be written by humans in human language, the authors/cattle begin their history powerfully thus:

> In the beginning there is a void. A void between us and history, between these words and our muted existence. How to cross this void? When language is by definition something we don't possess? You think that because of your writing you are the author of the world, but you're wrong. You were just an accident like the rest of us, floating in the sea of time…

[156] L. Gustafsson and T. Haapoja, 'The Museum of the History of Cattle', *Gustafsson&Haapoja*, http://www.gustafssonhaapoja.org/museum-of-the-history-of-cattle/, accessed 27 April 2021.
[157] Gustafsson and Haapoja, 'History According to Cattle.'
[158] *Ibid*, 11.

> But here I am, with my horns and tail and compartmented stomachs and a line of ancestors queuing and pushing behind me as if entering the spring field. Why? When history itself has rejected us and rendered us invisible, language as its weapon? The answer is simple: because we were there. We saw it all. But to break my silence, or what you take as silence, I must enter your language and domesticate you, like the cow whisperer tames a wild bull by talking to him with words he knows. So I borrow your words and carve myself into them, make a hole through them the shape of a cow. You might not see me, but you'll see my absence. This is where my story begins.[159]

With the necessity of using human language and human authors to write a history according to cattle, as well as the void between cattle and history, an unavoidable absence, duly acknowledged, the authors/the cattle proceed to narrate a history of cattle according to three historical periods. These are The Time Before History, The Historical Time, and The Ahistorical Time. The Time Before History refers to the period when cattle's ancestors, the Aurochs, emerged some two million years ago until the domestication of cattle by humans ten thousand years ago. In this era time is cyclical, Laura Gustafsson and Terike Haapoja write:

> Unlike human culture, cattle culture is not a linearly perceived historical continuum. For cattle, time is cyclic. Neither the past nor the future are of great importance; existing is what matters to bovines. It has been thus ever since the first ruminant trod the Earth. From one millennium to the next, unchanging rituals helped individuals to recognize their roles in society, and offered security amid the exigencies of life. The cultural stories lived on in the bodies of their narrators, in quiet grazing. They changed little by little, or if need be, very quickly, since cattle are adaptable. The greenest pastures, techniques of repose, respect for the value system, caring for calves, and mating conventions are learned through watching, listening, and by following intuition.[160]

Cattle, or beings that existed in between aurochs and the cattle domesticated during the agricultural revolution, transferred their cattle culture from generation to generation, the authors reasonably argue. The second period, The Historical Period, occurs from the agricultural revolution, when cattle revolutionised human cultures, until humans began industrialised farming of cattle during the industrial revolution. During the Historical Period, bovine and human cultures became deeply entwined.

[159] *Ibid*, 2.
[160] *Ibid*, 18.

> At the beginning of the Holocene, more than 10 000 years ago, the great Auroch starts to live side by side with the ape, gradually forgetting its traditional customs and learning a new way of life. Why this anomaly in history, this exchange, takes place, we don't know. We have only guesses and interpretations, unreliable traces of evidence. What we do know is that we, all of the 1.3 billion of us [cattle] living today, are the successors of approximately 80 individuals living with the Mesopotamian common ape 8000 years ago. From that moment on our destinies have been intertwined. The great Auroch had become cattle, and the ape the human as we know it today.[161]

The authors suggest a fundamental shift in cattle history from the industrial revolution.

> The Ahistorical Time has no linearity, nor cyclicity. Inside the factory the passing on of heritage became impossible. Calves were taken from us immediately when they were born, and family lines were scattered out of our sight. Doing was reduced to so little that all that was left of our habits died away. We did not learn from our mothers but from the machine that told our bodies how to stand and how to eat. Stuck in the industrial process we would live in collective isolation, cut off from all relations that could anchor us to time, history, culture. For how could we have culture, if culture was the transforming of things into objects? How could we have history, if history was the weaving together of times from the present moment into the past with a chain of words? We did not even have time – the only time we had was clock-time, ticking away in unison, counting. All we had was destiny, as unchangeable as the rotation of the sun in the sky, and even that we did not possess before it took us. If we were to see outside the factory, we would have seen the humans digging and carving, moulding, melting, cutting, jointing, burning and growing everything that passed their way. Like the earthworm that eats its way through the soil the humans worked through the world, processing everything into products of their culture. But what they could not see was that they were followed by eyes, eyes everywhere.[162]

After industrialised animal farming began in the late nineteenth century, intergenerational cultural transference among cattle in such institutions became impossible: the family unit, the mother-calf relationship, kinship, relationships, and social bonding became structurally excluded in the industrial animal regimes. In this way, from within the factories and feedlots and breeding stations, cattle did not and do not see time as cyclical or linear but more as a constantly interrupted and restarting present, the authors argue.

[161] *Ibid*, 2.
[162] *Ibid*, 3.

The Museum of Cattle History itself focuses on the Ahistorical Time, the period after the industrial revolution, the last 150 odd years. This period, they suggest, is the period in which cattle have experienced the most dramatic shifts. Laurie Carlson focuses her *Cattle: an Informal Social History* (2001) on the period between domestication and post-industrialisation, apportioning half the book to before and half to after industrialisation.[163] Erica Fudge's *Quick Cattle and Dying Wishes: People and Their Animals in Early Modern England* (2018) has a temporal range based on the sources informing the study, namely the wills of cattle owners in early seventeenth century England.[164]

Owing to its interest in colonialism in southern Africa, the thesis is empirically focused on the period between the mid-seventeenth century and the late twentieth century. The temporal arrangement thus spans from The Historical Period (after the agricultural but before the industrial revolution) into the Ahistorical time, since cattle in southern Africa entered industrial slaughterhouses in the early twentieth century. For some rural cattle communities (herds), namely those in relationships with rural human southern Africans, the mid-seventeenth until the late twentieth century does not comprise the period of The Ahistorical Time, because such cattle continue to have kin and mother-calf relationships, roam for example the Lesotho mountains, or the beaches of the Transkei in sunlight and oceanic air, and can transfer their bovine culture, their rearing and other cattle values, down the ancestral line, mother to calf, bovine peer to bovine peer.

Since cattle are domesticated animals, many shifts in cattle history are connected to shifts in human history. Colonialism in the southern African region generally, the arrival of wagon technology, the South African War, the emergence of refrigerated train carts, the formation of the Union of South Africa, forced artificial insemination technologies, and so forth, were all significant and transformative shifts for humans *and* cattle. Most of the events and shifts analysed in this thesis impacted both humans and cattle and thus its periodisation of cattle history is often similar to a periodisation of human history. Temporally, this thesis is more concerned with beginnings of colonial impacts, when they started rather than exploring when

[163] L. Carlson, *Cattle: An Informal Social History* (Chicago: Ivan R Dee, 2001).
[164] E. Fudge, *Quick Cattle and Dying Wishes: People and Their Animals in Early Modern England* (New York: Cornell University Press, 2018).

they ended. This is so because, with the exception of wagon labour, pedestrian observations suggest that fences, slaughterhouses, and cattle markets still profoundly impact the lives and experiences of southern African cattle. These colonial impacts are still felt and experienced by cattle. Thus, periodisation is concerned with when colonial processes that impacted cattle began and how these processes developed, rather than when these processes began, and ended.

Notes on language and terminology

The term cows is a colloquialism for cattle. But the term cows technically means female adult cattle. Thus, I use the term cattle to refer to those beings who are colloquially called cows. The source of the term cattle is from the Old French chattel meaning 'property', which derived from the medieval Latin *capitale*, from the Latin *capitalis* meaning 'of the head', in turn from the word *caput* meaning 'head', and from which the word capital too was derived.[165] Initially, the term cattle signified an alternative form of chattel property that could additionally specifically refer to cattle or other 'livestock'. From the mid-sixteenth century, the word cattle came to specifically signify cattle as distinct from the broader category chattel.[166] In the eleventh century, CE Proto-Nguni speakers used the term '*-fúyi', meaning 'to accumulate, be wealthy, to breed [cattle]', which indicates that southern Africans too saw cattle as a form of wealth, and breeding cattle as a path to prosperity.[167]

In *A Dictionary of the English Language* (1828) the modern spelling of cattle was used, and it defined cattle as 'beasts of pasture; not wild nor domestic'.[168] Earlier iterations of dictionaries, such as *Glossographia Anglicana Nova* (1707), deployed the spelling cattel but cattle did not have their own entry as a standalone term.[169] Elisha Cole's *An English Dictionary* (1676) defined pecunia as 'money, and (anciently) Cattel or other substance' but did not include an

[165] Cresswell, *Oxford Dictionary of Word Origins*, 81.
[166] *Ibid*.
[167] R. Jimenez, 'Rites of Reproduction: Gender, Generation and Political Economic Transformation among Nguni-Speakers of Southern Africa, 8th - 19th Century CE' (PhD Dissertation, Northwestern University, Illinois, 2017), 116.
[168] S. Johnson and J. Walker, *A Dictionary of the English Language* (London: George Cowie and Co, 1828), 12.
[169] I. Newton *et al*., *Glossographia Anglicana Nova: Or, a Dictionary* (London: Printed for Dan Brown *et al*., 1707), np.

entry for cattle themselves.'[170] The word 'fee' comes from the Old English word 'feah', literally meaning cattle, while the Latin term for cattle is *pecus* or *pecu*, as in pecuniary or impecunious.[171] The Middle English term peculier (peculiar) came from the Latin *peculiaris* meaning 'privately owned' or 'special', which is a derivative of *peculium*, 'property', which itself derived from *pecu*, cattle.[172] The etymology and semantics of the word cattle suggests that English speakers are slanted towards seeing cattle as chattel property and wealth, hints at cattle's position in the English-speaking world historically, and indicates that cattle may have been one of the early forms of private property.

Various researchers have explored how language can represent animals in ways that erase animals' subjectivity and individuality, objectify them, obscure their suffering, normalise their purported inferiority, and institutionalise violence towards them.[173] In many ways, language has worked against an understanding of cattle's experiences and subjectivity. Consider terms like 'dairy cow' and 'veal calf'. Conceptually, these terms are shorthand for cows who are forced to produce and part with their milk for humans, 'dairy cows', and calves who are deprived of iron for human culinary pleasure, 'veal calf'. Violence, and the human purposes of the animal are built conceptually into the words.

This thesis' approach to selecting words to write about cattle draws on Critical Discourse Analysis (CDA). Teun van Dijk defines CDA as:

> discourse analytical research that primarily studies the way social-power abuse and inequality are enacted, reproduced, legitimated, and resisted by text and talk in the social and political context. With such dissident research, critical discourse analysts take an explicit position and thus want to understand, expose, and ultimately challenge social inequality.[174]

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[170] E. Coles, *An English Dictionary* (Menston: The Solar Press, 1971 [1676]), 228.
[171] Editors of Merriam Webster, ed., *Webster's Dictionary of Word Origins* (New York: Barnes and Noble Books, 2004), 174–75.
[172] *Ibid*, 351.
[173] J. Dunayer, *Animal Equality: Language and Liberation* (New York: Lantern, 2002); A. Stibbe, *Animals Erased: Discourse, Ecology, and Reconnection with the Natural World* (Middletown: Wesleyan University Press, 2012), 4, 23; L. Mitchell, *Reading the Animal Text in the Landscape of the Damned* (Grahamstown: NISC, 2019), 19–21, 81, 152, 156.
[174] T. van Dijk, 'Critical Discourse Analysis', in D. Tannen, H. Hamilton, and D. Schiffrin (eds.), *The Handbook of Discourse Analysis* (Malden: Wiley Blackwell, 2015), 446. This reference from Mitchell, *Reading the Animal Text in the Landscape of the Damned*, 22.

According to Teun van Dijk, CDA is more an attitude than a method.[175] It *informs* word choices in this thesis and is not a methodological approach. CDA examines word choices and poses questions about who has power, who has status, who has agency, who is silenced, whether the term is an obscuring euphemism, and what assumptions underpin the word selections.[176] For example, the phrase *behaved like an animal* implies that animals standardly behave badly or in ways unbecoming of humans, and assumes a rigid dichotomy between superior humans and inferior animals.[177] To call a human an animal is in many human cultures considered pejorative. The euphemistic adjective and noun *beef cattle* implies that the purpose of cattle is to be bred, reared, slaughtered, and then butchered into segments of flesh for humans to sell and put into their mouths. The cattle are stripped of agency, interests, power, and subjectivity; they are silenced, and visiting violence upon them is normalised.

In this thesis, to signal normative disapproval of terms such as 'livestock', 'beef', and 'hides', which mischaracterise animals by reducing them to insensate commodities, I present these terms in inverted commas. Instead of 'beef', I use the accurate and non-euphemised noun cattle flesh. Instead of 'milk', I add a possessive qualifier, as in cow's milk or calf's milk, to signal that the milk belongs to the calf or cow. Instead of saying artificial insemination, I say forced artificial insemination, because for animals the process is always forced and the former term elides the forced aspect of it.[178]Artificial insemination is regarded as a euphemism that obscures, sanitises, and even conceals what is for animals a ghastly procedure.

When quoting other authors who use the definitive article *that* or the indefinite article *which*, instead of the pronoun *who*, as in the calf that escaped or the calf which escaped, instead of the calf who escaped, the word *sic* is often placed in square brackets after the article. This is to signal normative instead of grammatically prescriptive disagreement with the quoted author's use of language because such language presents the animal as an object (by using that or which) as opposed to a subject (by using who).

[175] van Dijk, 'Critical Discourse Analysis', 466.
[176] Mitchell, *Reading the Animal Text in the Landscape of the Damned*, 22–24.
[177] *Ibid*, 27.
[178] See Chapter Five.

More generally, there is no non-problematic word for animals. Because humans are animals, the term animals as distinct from humans is technically a misnomer. 'With equal validity', writes Joan Dunayer, 'we could categorize all animals as giant squids and non-giant-squids'.[179] The term non-human animals defines animals negatively – in terms of who they are not – and also centres humans. Some have suggested the term *anymals* to refer to any animals who are not human.[180] Acknowledging that humans are animals, the term animals is used to mean animals who are not human. Apart from breeding- or production-specific terms such as heifer, calf, or ox, there is no singular noun for cattle. The term cattle is a *plurale tantum*. There is no grammatically correct way to say one cattle. Conceptually, cattle are always a collective, never an individual. Thus, plural/singular verb agreement conventions are at times flouted, in that sometimes the term cattle is used in the singular, as in each cattle has a felt experience of the world. My research questions and chapter summaries follow.

Research questions and overviews of chapters

This project is an investigation of colonialism in southern Africa that places cattle at the centre of analysis and focuses on the impacts of colonialism on cattle. The guiding research question is: What are some of the major impacts of colonialism on the lives and experiences of southern African cattle?

In answering this wider question, each substantive historical chapter focuses on a related sub-question. The thesis contains four substantive, empirical historical chapters – Chapter Two to Chapter Five. My reading of animal histories convinced me that a deep, serious interdisciplinary investigation of cattle's experiential capacities was required. Therefore, in Chapter One I build up a picture of cattle as richly sentient, social and experiential beings. In Chapter One I also sketch a history of cattle from domestication, and historically locate them in broad southern African social and economic contexts before the emergence of colonialism.

[179] Dunayer, *Animal Equality: Language and Liberation*, 13.
[180] L. Kemmerer, 'Verbal Activism: "Anymal"', *Society & Animals* 14, 1 (2006), 9–14; S Borkfelt, 'What's in a Name?—Consequences of Naming Non-Human Animals', *Animals* 1, 1 (2011), 120.

The project is arranged thematically and chronologically. As a first sustained history of southern African colonialism's impacts on cattle's experiences, the *types* of impacts investigated are not comprehensive. Instead, the project sought to investigate *some* major impacts of colonialism. These impacts were selected on the basis that they had significant effects on cattle's experiences and history, and that appropriate sources could be drawn upon to compellingly investigate these effects. The project comprises the following major themes: cattle as colonial wagon labourers (1653 to 1890s) disease epidemics (1854 to 1920s), the development of slaughterhouses (1652 to 1930s), and cattle breeding regimes (1900s to 1980s). These themes are explored regionally. The thesis's substantive empirical investigations begin with the arrival of the Dutch East India Company (VOC) in 1652.

Chapter One provides an introduction to cattle as subjects, and a brief, contextualising history of cattle before southern African colonialism. A history of cattle's experiences demands an interdisciplinary understanding of cattle as subjects. Thus, Chapter One opens by deploying an interdisciplinary approach to present cattle as sentient, experiential, social beings. It invokes diverse evidence to depict cattle as possessing the requisite physiology, neurochemicals, sensory faculties, and social structures to be experiential subjects. This connects to the project's conception of species-specific agency, which requires that an animal's species-characteristic agency is understood. Drawing on archaeology, zooarchaeology, geomorphology, and comparative historical linguistics, the chapter then historically locates cattle in southern Africa before colonialism, by sketching a history of cattle from domestication until they were a core part of southern African cattle-keeping societies in southern Africa in the mid-second millennium CE. Thereafter, we proceed to the core empirical, historical chapters. Chapter One thus sets up the empirical investigations which follow.

Chapter Two explores oxen's experiences as colonial wagon labourers and their transport contributions to the development of southern Africa. It poses two questions. How did wagon labour affect the experiences of cattle? And, what, if any, contribution to the development of southern Africa did oxen's wagon labour comprise? Chapter Two focuses on the period from 1653, when wagon labour began in southern Africa to the 1890s, when wagon labour was largely eroded by a combination of rinderpest and the development of railway infrastructure.

For over 200 years after the VOC arrived at the Cape of Good Hope, at the southern tip of Africa, oxen's forced wagon labour comprised the primary mode of colonial transport in southern Africa. This chapter offers a sustained investigation of oxen as wagon labourers from the VOC's arrival until the late nineteenth century. It provides a general regional history of oxen's compelled wagon transport, and a periodisation of oxen's wagon labour. It explores the impacts of wagon labour by presenting vignettes of different aspects of wagon labour in terms of how they affected oxen's experiences. It draws on numerous published accounts of scientific explorers, travellers, contemporary observers, and missionaries, and also contemporaneous documents and secondary literature.

Chapter Three explores Lungsickness, rinderpest, and East Coast fever. It investigates how diseases eroded cattle's transhumance relations with humans, enabled veterinary expansion, and transformed cattle into biomedical subjects. This chapter investigates how three major disease epidemics – Lungsickness, rinderpest, and East Coast fever – subjectively impacted cattle's experiences in southern Africa. Its guiding questions are, how were individual cattle impacted by Lungsickness, rinderpest and East Coast fever, and how were cattle as groups affected? It approaches the diseases by centring cattle and focusing on what the diseases meant for cattle. It describes the symptoms and disease courses. It investigates the responses of states, cattle-keepers, and farmers to the epidemics. The chapter traces the emergence of veterinary regimes in the region, since these were consequences of the diseases, and notes how veterinary regimes affected cattle history in the region. Significant aspects of colonial state expansions came to exert control over the lives and experiences of cattle in wake of the diseases. It shows how these diseases eroded cattle's transhumant relations with southern African cattle-keepers. The chapter begins with the emergence of Lungsickness in the Cape Colony in 1853. It closes by discussing the cattle dipping infrastructure in the region in the 1920s, which was implemented as a response measure to East Coast fever.

Chapter Four provides a history of slaughterhouse development in the Cape, and explores cattle's experiences of slaughterhouses. The question it focuses on is, how did industrial slaughter enterprises develop and affect the lives and experiences of cattle? It begins with the first VOC slaughterhouse in 1665 and closes in the 1930s when animal welfare laws related to slaughter were first implemented. Slaughterhouses were a major cattle-affecting

colonial institution. This chapter traces the development of slaughterhouses from the early VOC markets and butchering sites in the mid-seventeenth century until the proliferation of early twentieth century, centralised, industrial slaughterhouses in South Africa and their emergence in colonial Namibia, Botswana and Zimbabwe. The secondary literature on historical slaughterhouses in South and southern Africa is thin to almost non-existent. This explains why this chapter is largely focused on South Africa as a case study for slaughterhouse development, even though the spread of slaughterhouses in the region is touched upon, and some regional impacts of South Africa's cattle markets are noted. This chapter draws on diverse, myriad, and previously unused historical sources to produce a history of slaughterhouse developments in South Africa, with a particular focus on the Cape. The South African War, 1899-1902, and the animal flesh rations supplied to mineworkers on compounds in South African mines are isolated as drivers of the expansion of South Africa and the region's cattle flesh industries, which in turn enabled the development of industrialised slaughterhouses in the early twentieth century. Novel sources such as architectural designs of municipal slaughterhouses, coupled with SPCA and other slaughterhouse investigations, enable historical access into slaughterhouses in the early twentieth century.

Chapter Five investigates colonial cattle breeding and its impact on cattle in South Africa and Botswana. Its primary questions are, how did colonial breeding regimes impact cattle as a group in South Africa and Botswana? And, how did breeding processes affect the lives and experiences of cattle? The chapter also investigates, to a lesser degree, attempts at a colonial breeding regime in colonial Swaziland. It begins in the 1900s, when the nascent South African state started to become increasingly involved in cattle breeding, and closes in the 1980s, when cattle breeding in Botswana became modernised. The chapter investigates colonial cattle breeding regimes in South Africa, and colonial Swaziland and Botswana from the early twentieth century, as well as developments of modernised breeding regimes from the mid-twentieth century until the 1980s. The development of colonial and modern breeding regimes is placed in the global context of modernised state-backed breeding regimes, and in particular the developments of forced artificial insemination technologies. Whereas the previous three chapters investigate colonial impacts of cattle as forced wagon labourers, as biomedical subjects, and in slaughterhouses, this chapter explores cattle's experiences beyond labour, health, and ways of dying by investigating how certain cattle were permitted to live and

forced to reproduce. Although the chapter cursorily describes aspects of cattle breeding before the twentieth century, its main temporal focus is on the early twentieth century until the 1980s.

The thesis' Conclusion sums up each chapter's answers to each chapter's specific questions. It then connects these answers to the thesis' primary research question. In doing so it summarises the thesis' answer to the primary question this thesis endeavoured to respond to, namely: what were some of the major impacts of colonialism on the experiences of cattle? The conclusion notes the thesis' core contributions. The conclusion also indicates directions future research could take.

The thesis closes with an Epilogue, which argues that contemporary cattle industries are closely connected to multiple, global ecological and health threats, including antibiotic resistance, zoonotic threats, biodiversity loss, climate change, deforestation, and disproportionate land and water use, for example. The Epilogue argues that shifting attention to the natural world, to the animals with whom we share the planet, is timely and defensible.

Chapter One: An introduction to cattle as subjects, and a brief history of cattle before southern African colonialism

Introduction

This chapter consists of three sections and has two aims. The first section aims to present cattle as subjects. To position cattle as beings with minds, emotions, experiences, social bonds, and social lives. Its objective is to present cattle as richly sentient, experiential subjects. To do so, it draws on diverse empirical literature from animal science, physiology, neuroscience, veterinary science, zoology, animal behaviourism, and animal welfare science. This is unconventional for a historical investigation. An orthodox human history, a history about humans, entails no need to make a case for humans as experiential subjects. This is because readers of such histories can be presumed to recognise that humans are experiential subjects. A cattle history, which conceives of cattle as subjects, cannot assume that cattle are recognised as experiential subjects, as beings with affect, sensory experiences, social lives, and psychological experiences. Thus, the first part of this chapter invokes diverse evidence to introduce cattle as subjects. The four empirical historical chapters which follow this chapter investigate the impacts of colonialism on the cattle's experiences, and are at times referred to in the discussions below. To understand these impacts from a cattle perspective, cattle are first positioned as the types of beings who can have experiences. This motivates the science-based discussions of cattle as subjects, which comprise the first half of the chapter.

The second aim is to historically locate cattle in southern Africa before the arrival of settler colonialism in the mid-seventeenth century. The evidence drawn upon includes genetic histories, archaeology, zooarchaeology, evolutionary anthropology, geomorphology, and comparative historical linguistics. It sketches a history of cattle since their domestication during the agricultural revolution, circa 10 000 BCE, and the movement of cattle from the north of Africa into the sub-Saharan region, and then later into southern Africa. It then draws on recent comparative historical linguistics research to indicate that from about 1 000 CE cattle in southern Africa became increasingly connected to the social, and economic worlds of Nguni-speaking human communities. In this sketch of cattle history before southern African colonialism, cattle's experiences are not explored in depth. The purpose of this pre-colonial historical narrative is to set up the four core empirical chapters which follow this chapter, so that they can examine how colonialism subjectively impacted cattle in southern Africa.

Cattle as experiential subjects

What follows is an interdisciplinary discussion of cattle as mind-possessing, biological, and social beings. Cattle comprise a group of bovine animals who are each unique individuals, with personalised and distinct experiences and lives. While there is variation between individuals, as with humans, and other mammals, birds and fish, there are some valid species-level descriptions.

Cattle are large vegetarian ruminant bovines who can live to over 25 years, weigh a ton or more, drink sometimes 150 litres of water a day, can be nocturnal, can be homosexual, in free-roaming contexts often move in matrilineal herds, choose best friends with whom to graze, engage in dopaminergic grooming, take anxiolytics and narcotics, and can sleep while standing up.[1]

For a history that recognises the subjective life of cattle, the most important thing to know about cattle is they have consciousness and are sentient. Sentience is the cognitive capacity to have felt experiences and perceptions.[2] Each individual cattle is a centre of experience, each has a subjective, felt experience of her life. We know this because cattle, and all mammals, birds, and reptiles have central nervous systems.[3] Each cattle has a periaqueductal grey, brain stem, limbic system, cerebellum, cerebral cortex, amygdala and hypothalamus.[4] These brain features are correlates of consciousness.

[1] M. Stewart-Burger, 'Water and Your Cows (blog)', *Farmer's Weekly*, 20 June 2012, https://www.farmersweekly.co.za/animals/cattle/water-and-your-cows/, accessed 15 November 2019; C. Phillips, *Cattle Behaviour and Welfare* (Malden: Blackwell Science, 2002), 7, 89, 91, 95; C. Phillips, *The Welfare of Animals: The Silent Majority* (Netherlands: Springer, 2009), 41; C. Lee *et al*., 'Anxiety Influences Attention Bias but Not Flight Speed and Crush Score in Beef Cattle', *Applied Animal Behaviour Science*, 205 (2018), 210; D. Anderson and W. Muir, 'Pain Management in Cattle', *Veterinary Clinics: Food Animal Practice* 21, 3 (2005), 623.

[2] D. Broom, *Sentience and Animal Welfare* (Oxfordshire: CABI, 2014), xiii–xiv.

[3] Low, 'The Cambridge Declaration on Consciousness', 2012.

[4] B. Cantrell *et al*., 'Global DNA Methylation in the Limbic System of Cattle', *Epigenomes* 3, 8 (2019), 1–4.

Cattle are also biologically governed by processes of homeostasis.[5] As soon as homeostatic states are marginally veered away from, as with humans, cattle presumably experience discomfort and pain, because maintaining homeostasis promotes organisms' survival and relieves distress.[6] But it is not easy to notice cattle's discomfort. As plains-living animals, disinclined to be seen as easy targets to predators, cattle try to be inconspicuous about pain.[7] Which 'means you don't get much by way of obvious behaviour – even for 10 seconds unless they are very unhealthy or very stressed' says animal behaviourist Jonathan Amory who studies cattle.[8] It is not that cattle are mute about their suffering, it is that we require different ways to recognise it. Some authors have studied cattle's visible eye whiteness to assess positive and negative emotional valences, and have found that decreased visible eye whiteness correlates to positive emotional states in cattle, suggesting that this eye whiteness may be a measure of emotional states in cattle.[9] Other studies have explored nasal temperatures, heart rates and ear postures as potential correlates of cattle's emotional states.[10]

Though they may not often disclose it in obvious ways, cattle suffer and they get scared. Cattle have amygdalae, which in humans, rats, goats, and sheep is the brain part associated with fear and memories of fear.[11] It is neurochemically legitimate to say that it can be scary and stressful to be cattle.[12]

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[5] H. Martens *et al*., 'Magnesium Homeostasis in Cattle: Absorption and Excretion', *Nutrition Research Reviews* 31, 1 (2018), 114.
[6] A. Craig, 'A New View of Pain as a Homeostatic Emotion', *Trends in Neurosciences* 26, 6 (2003), 303–4; C. Salcido, M. Geltmeier, and P. Fuchs, 'Pain and Decision-Making: Interrelated Through Homeostasis', *The Open Pain Journal* 11 (2018), 31.
[7] K. Adamczyk *et al*., 'Perception of Environment in Farm Animals–A Review', *Annals of Animal Science* 15, 3 (2015), 567.
[8] A. Frood, 'How Can You Tell If an Animal Is Happy or Sad?', *Phys.Org*, 11 May 2016, https://phys.org/news/2016-05-animal-happy-sad.html., accessed 9 January 2019.
[9] H. Proctor and G. Carder, 'Measuring Positive Emotions in Cows: Do Visible Eye Whites Tell Us Anything?', *Physiology & Behavior* 147 (2015), 6.
[10] E. Mohr, J. Langbein, and G. Nürnberg, 'Heart Rate Variability: A Noninvasive Approach to Measure Stress in Calves and Cows', *Physiology & Behavior* 75, 1 (2002), 251; H. Proctor and G. Carder, 'Can Ear Postures Reliably Measure the Positive Emotional State of Cows?', *Applied Animal Behaviour Science* 161 (2014), 20; H. Proctor and G. Carder, 'Nasal Temperatures in Dairy Cows Are Influenced by Positive Emotional State', *Physiology & Behavior* 138 (2015), 340.
[11] I. George *et al*., 'Comparative Neuroanatomical Study of the Amygdala and Fear Conditioning in Nigerian Breeds of Artiodactyla: Sheep (Uda) and Goats (Red Sokoto)', *The Anatomical Record* 304, 4 (2021), 698, 701, 702.
[12] N. Burdick *et al*., 'Interactions between Temperament, Stress, and Immune Function in Cattle', *International Journal of Zoology* (2011), 1–6.

When stressed, like humans, cattle's adrenal glands release catecholamines.[13] Catecholamines are neurotransmitters associated with physical and emotional stress. Three relevant catecholamines are dopamine, norepinephrine, and epinephrine. Norepinephrine restricts blood vessels and increases blood pressure and accelerates heart rates.[14] Epinephrine or adrenaline, functions as an 'alarm system', increases muscle strength and heart rate, or stress responses, and is associated with fear.[15] Cattle have the brain hardware and the neurotransmitters for experiences of fear. Cattle's anxiety-related behaviours correlate to increased cortisol levels.[16]

Cattle also have things to be scared and stressed about. Some have noted that extreme stress during transport and slaughter is for cattle 'unavoidable'.[17] This connects to my reading of historical sources about the development of slaughterhouses in South Africa, which are explored in Chapter Four. Cows also for example care intensely about their young and in free-roaming contexts can form long-term and likely lifelong bonds.[18] This is important for Chapter Five, where I investigate colonial breeding regimes, and note that these regimes were premised on breaking bulls and cows' kinship bonds. The image below depicts a free-roaming Nguni cow and her newborn calf. During fieldwork, I observed and photographed calves' close relations with adult cows.

[13] G. Mitchell, J. Hattingh, and M. Ganhao, 'Stress in Cattle Assessed after Handling, after Transport and after Slaughter', *The Veterinary Record* 123, 8 (1988), 201.
[14] Burdick *et al*., 'Interactions between Temperament, Stress, and Immune Function in Cattle', 3–4.
[15] *Ibid*, 4.
[16] D. Bristow and D. Holmes, 'Cortisol Levels and Anxiety-Related Behaviors in Cattle', *Physiology & Behavior* 90, 4 (2007), 626–28.
[17] L. Costa, 'Short-Term Stress: The Case of Transport and Slaughter', *Italian Journal of Animal Science* 8, 1 (2009), 241.
[18] Phillips, *The Welfare of Animals*, 33; Reinhardt and Reinhardt, 'Cohesive Relationships in a Cattle Herd (Bos Indicus)', *Behaviour* 77, 3 (1981), 144, 145, 147.

Image 1.1. Young calf and mother, 9 October 2019 Matjiesfontein

Source: Author.

When calves drink cows' milk from cows' udders by suckling, both cows and calves produce and release oxytocin.[19] In animals more broadly, oxytocin is connected to pair-bonding, maternal care, and generally promotes social connection.[20] In humans, oxytocin is released during orgasm, breastfeeding and childbirth, and is also associated with bonding.[21] Cattle have experiences that include oxytocin releases.

[19] B. Lupoli *et al*., 'Effect of Suckling on the Release of Oxytocin, Prolactin, Cortisol, Gastrin, Cholecystokinin, Somatostatin and Insulin in Dairy Cows and Their Calves', *Journal of Dairy Research* 68, 2 (2001), 175.
[20] M. Kosfeld *et al*., 'Oxytocin Increases Trust in Humans', *Nature* 435, 7042 (2005), 673, 676.
[21] M. Heinrichs, I. Neumann, and U. Ehlert, 'Lactation and Stress: Protective Effects of Breast-Feeding in Humans', *Stress* 5, 3 (2002), 195; J. Alley and L. Diamond, 'Oxytocin and Human Sexuality: Recent Developments', *Current Sexual Health Reports* 12, 3 (2020), 182.

Cattle also possess the organs and biology for sensory perceptions, including touch, smell, taste, sight, and hearing. Cattle see, hear, taste, smell, and think about the world around them. Recognising cattle as having sensory faculties bears on all of the following historical chapters, since these faculties enable them to experience historical shifts and processes. A recognition of these faculties informs the interpretation of how cattle experienced disease epidemics, wagon labour, breeding processes, and slaughterhouses. Since in their evolutionary past they were susceptible to predators, cattle's eyes are located on the sides of their heads. Their eyes on the sides of their heads are depicted below. Cattle have 330-degree vision, with a 30-degree blind spot behind their heads.[22] Imagine 1.2 depicts cattle with their eyes on the sides of their heads.

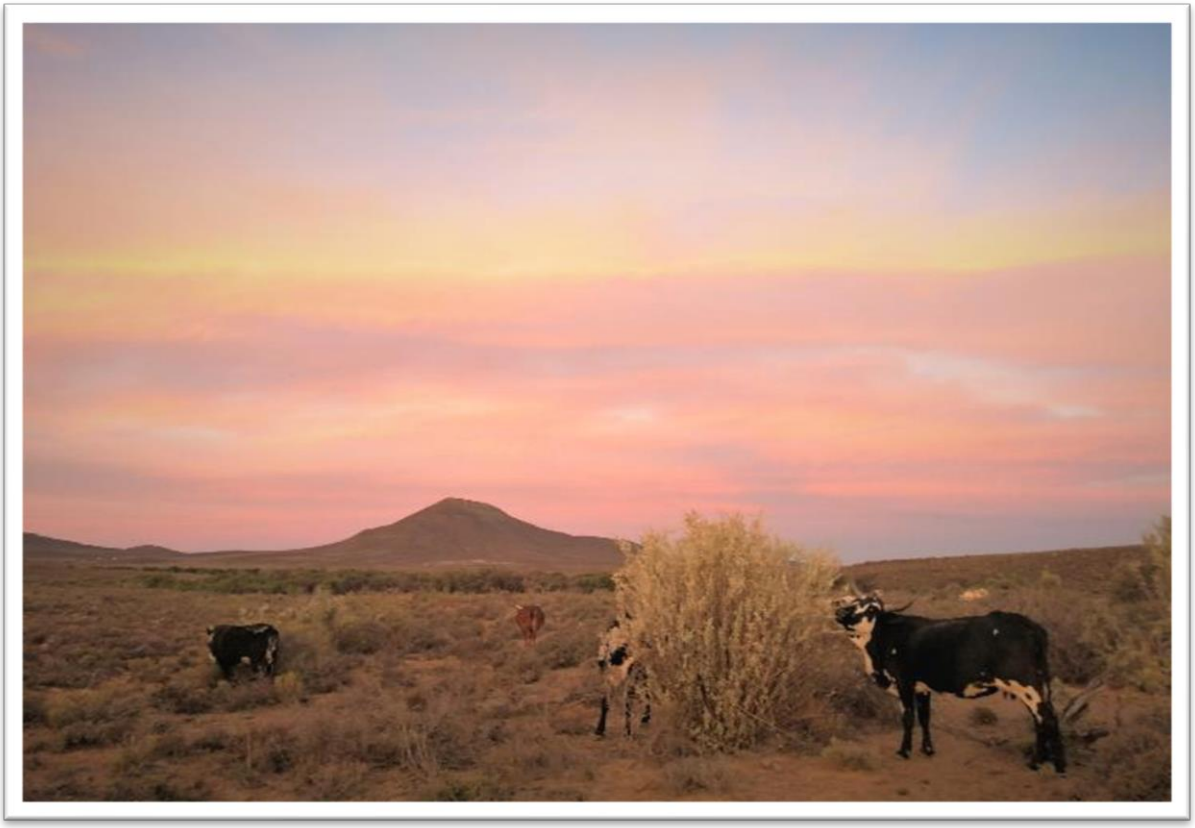
Image 1.2. Nguni adult female cow and calf, 30 September 2019, Matjiesfontein

Source: Author.

[22] L. Marino and K. Allen, 'The Psychology of Cows', *Animal Behavior and Cognition* 4, 4 (2017), 475.

Cattle's binocular vision ranges between 20 and 50 degrees.[23] Their vision focuses on moving objects less than stationary objects, which is likely why sudden human movements cause anxiety and even panic for cattle.[24] Sight is a dominant sense for cattle and they are estimated to receive 50% of their information visually.[25] Cattle can recognise 50 to 70 fellow cattle (conspecifics).[26] Cattle can also distinguish humans by their clothes and faces, and can distinguish between different humans wearing the same clothes.[27] Cattle can detect colours across the spectrum, but more acutely perceive warm as opposed to cold colours.[28] Thus, cattle's eyes can view sunsets such as the one depicted below.

Image 1.3. Nguni cattle at sunset in the Karoo, 22 October 2019, Matjiesfontein



Source: Author.

[23] *Ibid*.
[24] Adamczyk *et al*., 'Perception of Environment in Farm Animals–A Review', 567.
[25] *Ibid*.
[26] D. Broom and A. Fraser, *Domestic Animal Behaviour and Welfare* (Oxfordshire: CABI, 2007), 129.
[27] A. Taylor and. H Davis, 'Individual Humans as Discriminative Stimuli for Cattle (Bos Taurus)', *Applied Animal Behaviour Science* 58, 1 (1998), 13.
[28] Adamczyk *et al*., 'Perception of Environment in Farm Animals–A Review', 567.

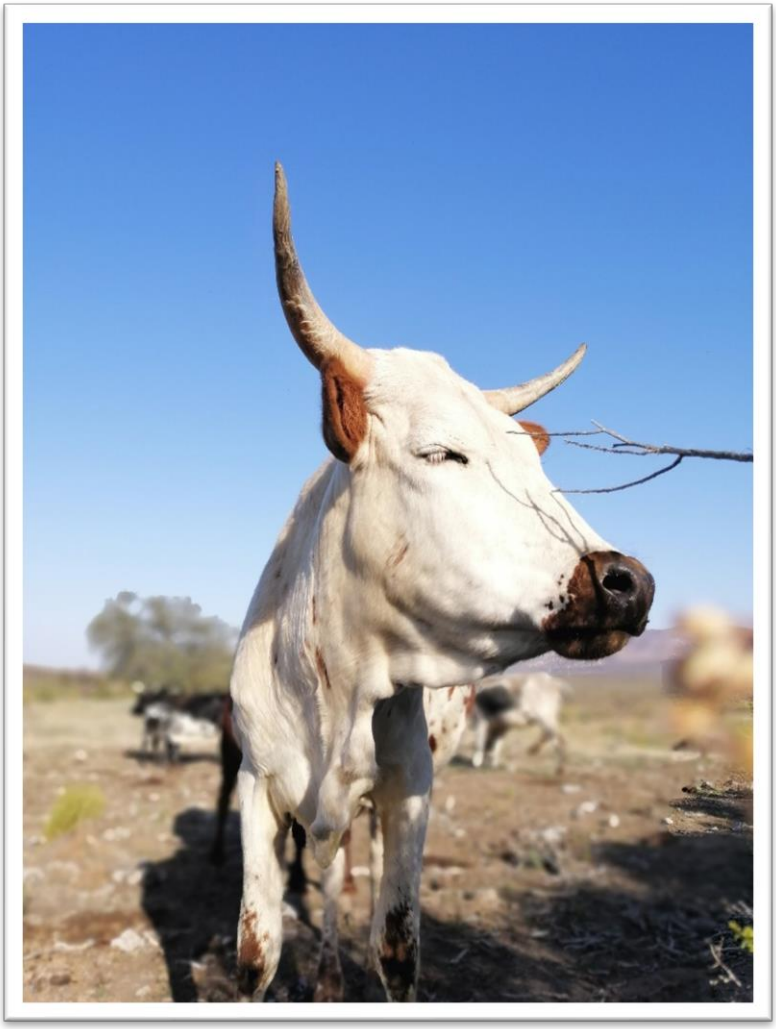
Cattle are more sensitive to low pitched sounds than humans and can detect sound between 20 Hz to 35kHz.[29] Cattle's noise localisation capacity, or ability to determine whence a noise comes, is poorer than humans', so that some speculate that this adds to cattle's fearfulness.[30] Cattle detect sounds well but locate sounds less well. Cattle's sense of taste is highly developed and can distinguish the four primary tastes; their taste desire correlates to their current nutritional requirements.[31] They prefer sweet foods for energy, and salty foods for maintaining electrolytes, while sour foods are chosen for ruminal pH balances.[32] Bitter foods represent harm to bovines. While humans have between 2 000 and 8 000 taste buds, cattle have 20 000.[33] Cattle have extremely sophisticated four-part multi-directional digestive systems, capable of transforming the calories in grass into energy to sustain 1 000+ kilogram bovine adults.[34] Such digestive systems have complex enzymatic ecosystems, that in processing plant matter release large quantities of methane. Interestingly, bovines can communicate their psychological states to one another via pheromones, in particular those related to states of fright or stress; they can smell stress hormones in each other's urine.[35] They have complex odiferous glands including interdigital, inguinal, sebaceous, and infraorbital.[36] This means that contexts in which cattle experience stress, such as when oxen perform wagon labour, as explored in Chapter Two, or while being dragged to slaughter poles, explored in Chapter Four, or when they are biomedically experimented on, as discussed in Chapter Three, cattle register and co-experience each other's stress.

Bovines are sensitive to tactile touch. Cattle can use their tails to swish away a fly in a particular place on their skin, which implies acute tactile sensitivity.[37] Cattle have

[29] R. Heffner and H. Heffner, 'Hearing in Large Mammals: Horses (Equus Caballus) and Cattle (Bos Taurus)', *Behavioral Neuroscience* 97, 2 (1983), 302–3.
[30] Adamczyk *et al*., 'Perception of Environment in Farm Animals–A Review', 567; Phillips, *Cattle Behaviour and Welfare*, 54.
[31] Phillips, *Cattle Behaviour and Welfare*, 57.
[32] C. Ginane, R. Baumont, and A. Favreau-Peigné, 'Perception and Hedonic Value of Basic Tastes in Domestic Ruminants', *Physiology & Behavior* 104, 5 (2011), 666; Phillips, *Cattle Behaviour and Welfare*, 57–58.
[33] Marino and Allen, 'The Psychology of Cows', 476.
[34] M. Clauss and R. Hofmann, 'The Digestive System of Ruminants, and Peculiarities of (Wild) Cattle', in M. Melletti and J. Burton (eds.), *Ecology, Evolution and Behaviour of Wild Cattle: Implications for Conservation* (Cambridge: Cambridge University Press, 2014), 57, 59.
[35] M. Bouissou *et al*., 'The Social Behaviour of Cattle', in L. Keeling and H. Gonyou (eds.), *Social Behavior in Farm Animals* (Wallingford: CABI Publishing, 2001), 117.
[36] Marino and Allen, 'The Psychology of Cows', 476.
[37] Thanks to Harry Wels for pointing this out to me.

mechanoreceptors, thermoreceptors, and nociceptors in their skin and muzzles, meaning they can feel mechanical pressure, temperature, and pain.[38] Like dogs and cats, cattle can be fearful of human touch or derive pleasure from scratching behind their ears.[39] A Nguni cow is depicted scratching her head on a branch, below.

Image 1.4. Nguni cow scratching her head on a branch, 26 September 2019, Matjiesfontein



Source: Author.

Cattle are highly social animals, with complex and multi-modal communication channels, who use allelomimetic behaviour – synchronous, mimetic, imitative behaviour – to facilitate group cohesion.[40] Herd cohesion or good social dynamics are important to cattle. Cattle select

[38] Phillips, *Cattle Behaviour and Welfare*, 58–59.
[39] Marino and Allen, 'The Psychology of Cows', 476.
[40] Bouissou *et al.*, 'The Social Behaviour of Cattle', 115–17, 129, 135; Phillips, *Cattle Behaviour and Welfare*, 84.

friends, next to whom they sleep and eat, and friends whom they lick (allogroom), while maternal bonds with calves are strong.[41] Allelomimetic behaviour of cattle can include synchronicity like lying down, walking, standing, grazing together, or urinating in response to alarm.[42]

Herds comprise social hierarchies with leaders and lower-ranking members.[43] Cattle recognise each other via sight, hearing and smell, which enables social interactions and recognition of the group structure.[44] They primarily recognise each other via vision but sound is important for maternal-juvenile recognition, while olfactory signals like pheromones are interpreted when at close quarters.[45] Bovines use vocalisations to elicit recognition and tactile contact, to greet, threaten or show fear, and during sexual arousal.[46] Shouting alarms cattle, they become fearful and their hearts race when they are shouted at.[47] In the next chapter on forced wagon labour, I show that oxen were frequently shouted at to impel them forward on arduous journeys.

Herds are hierarchical. Hierarchy in herds determines access to resources.[48] In intensive agriculture where food and water are provided, hierarchies confer access to space – dominant cattle have access to more space.[49] Bulls butt each other's heads or lock horns to establish or re-assert dominance, as do cows when needing to communicate their rank in a hierarchy, although aggression within matrilineal herds is rare.[50] Two images below depict two cows butting their horns as part of negotiating a social hierarchy, which I witnessed during my fieldwork.

[41] Phillips, *Cattle Behaviour and Welfare*, 94–96, 105, 177, 214.
[42] S. Stoye, M. Porter, and M. Dawkins, 'Synchronized Lying in Cattle in Relation to Time of Day', *Livestock Science* 149, 1 (2012), 71–72; Broom and Fraser, *Domestic Animal Behaviour and Welfare*, 100, 129–130.
[43] Bouissou *et al*., 'The Social Behaviour of Cattle', 123–29.
[44] Phillips, *Cattle Behaviour and Welfare*, 86.
[45] *Ibid*.
[46] *Ibid*, 96.
[47] D. Waynert *et al*., 'The Response of Beef Cattle to Noise during Handling', *Applied Animal Behaviour Science* 62 (1999), 27.
[48] Phillips, *Cattle Behaviour and Welfare*, 104.
[49] *Ibid*.
[50] Bouissou *et al*., 'The Social Behaviour of Cattle', 129.

Images 1.5 and 1.6. Nguni cows lock horns, 9 October 2019, Matjiesfontein

Source: Author.

The key predictors of ranking in a herd are age, weight, and experience, although cattle need to acquire social skills to gain a higher rank.[51] Once a hierarchy is established, aggression does

[51] Phillips, *Cattle Behaviour and Welfare*, 105; D. M Broom and J. D Leaver, 'Effects of Group-Rearing or Partial Isolation on Later Social Behaviour of Calves', *Animal Behaviour* 26 (1978), 1261–62.

not need to be enacted as frequently – a swing of the head, a nudge or bump from a higher-ranked bovine and a retreat from a lower-ranked bovine is often sufficient to confirm the hierarchy.[52] Locking horns, poking with horns, nudging, bumping, or butting heads can occur during social tension and disagreements, but these become less likely in established social arrangements. A bovine's station within a hierarchy is maintained through regular communication.[53] When young, cattle learn their station in the hierarchy via play, to prevent aggressive assertions of the hierarchy later.[54] Calves who are isolated from their herd have decreased cognitive learning abilities, are socially maladaptive, experience stress more often, and remain lower down in the social hierarchy.[55]

In modern domesticated cattle, preferred social arrangements are radically undermined and cows and growing cattle are divided into age and sex groups after about six months.[56] Bulls that are used for breeding programmes may be in solitary confinement for their entire lives. Calves are often taken from their mothers soon after birth to prevent them from drinking milk. Chapter Five on colonial breeding regimes is an investigation of how modern breeding began in South Africa and Botswana. It reads historical sources and shifts with an understanding that forced separations can be understood as destructive to herd dynamics and interpersonal relations, and also harmful to the social and cognitive development of calves.

Another way that cattle maintain their relationships with one another is via grooming. Cattle groom one another, allogroom, for bodily care – but grooming is also affiliative and performs nutritional, communicative, social, and psychological functions.[57] Grooming mostly involves licking the head and neck areas of other cattle. Grooming reinforces kin bonds and friendships, likely reduces tension, and is dopaminergic.[58] That is, psychologically, grooming

[52] Phillips, *Cattle Behaviour and Welfare*, 105.
[53] *Ibid*, 85.
[54] *Ibid*, 82.
[55] C. Gaillard *et al*., 'Social Housing Improves Dairy Calves' Performance in Two Cognitive Tests', *PLOS ONE* 9, 2 (2014), 1–5; Phillips, *Cattle Behaviour and Welfare*, 101.
[56] Phillips, *Cattle Behaviour and Welfare*, 85.
[57] Reinhardt and Reinhardt, 'Cohesive Relationships in a Cattle Herd (Bos Indicus)', 123, 126, 147; Phillips, *Cattle Behaviour and Welfare*, 33, 95.
[58] Phillips, *Cattle Behaviour and Welfare*, 95; Bouissou *et al*., 'The Social Behaviour of Cattle', 123.

releases dopamine, and produces an opiate effect.[59] Since self-grooming increases in intensive production environments, some hypothesise that cattle self-groom as a form of self-narcotisation.[60] Cattle comfort themselves and each other via dopaminergic grooming.

Among cattle, cows bond with calves.[61] Fathers, the bulls, are socially and psychologically distant, and do not bond with calves in the way mothers do. Bonding begins soon after birth and persists in matrilineal herds.[62] Bonding between mothers and calves occurs postnatally via imprinting and is 'permanent and irreversible'.[63] Social bonds between mothers and calves are maintained by grooming, vocalisations, and keeping near to one another. Calves learn their place in the social structure by learning the dietary and herd conventions from their mothers. The strength of a mother cow's bonds with her offspring is similar, notwithstanding the age and sex differences of her offspring.[64] Calves usually start to seek out peer relationships, peer to peer bonds, a week or two after birth.[65] Tight social cohesiveness has been observed in semi-wild herds, and often all members of the herd are affiliated with each other.[66] The foregoing discussions have sought to demonstrate that cattle have rich social lives and social and kin connections, that they have affect and sensory perceptions, and the hormones, neurotransmitters, and neurological structures which underpin rich and varied experiences.

Prior to current research and debates about cattle emotions and perceptions, thinking that animals and humans might experience emotions similarly or in cognate ways was sometimes dismissed as a form of anthropomorphism.[67] While these concerns have more recently lost their force, the term is popularly and pejoratively employed often enough to merit a discussion of it here.

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[59] Phillips, *Cattle Behaviour and Welfare*, 95; Broom and Fraser, *Domestic Animal Behaviour and Welfare*, 94.
[60] Phillips, *Cattle Behaviour and Welfare*, 95.
[61] Bouissou *et al*., 'The Social Behaviour of Cattle', 118.
[62] *Ibid*, 118–19.
[63] Phillips, *Cattle Behaviour and Welfare*, 101.
[64] *Ibid*, 101–2.
[65] Bouissou *et al*., 'The Social Behaviour of Cattle', 120.
[66] Reinhardt and Reinhardt, 'Cohesive Relationships in a Cattle Herd (Bos Indicus)', 147.
[67] C. Wynne, 'What Are Animals? Why Anthropomorphism is Still Not a Scientific Approach to Behavior', *Comparative Cognition & Behavior Reviews* 2 (2007), 125–35.

Anthropomorphism is the ascription of human experiences and emotions to animals. In Milton's *Paradise Lost* (1663) there is a form of anthropomorphism in which angels' minds are made comprehensible by being presented as on a continuum with human minds.[68] In response to Charles Darwin's blurring of the lines between species, in terms of natural selection and emotional and psychological similarities between humans and animals, in 1858 the term anthropomorphism was expanded by George Henry Lewes to include animals.[69] When ethology emerged in the 1930s to study animals in their natural environments, anthropomorphism was regarded with suspicion. In *The Study of Instinct* (1951), which defined the field of ethology, Niko Tinbergen wrote: 'Because subjective phenomena cannot be observed objectively in animals, it is idle to claim or deny their existence'.[70] Since then, there have been myriad discussions around the appropriacy of applying concepts like emotions and mental states to animals – whether anthropomorphism is legitimate or not.[71] Mindful of previous concerns of anthropomorphism, advances in disciplines like affective neuroscience, neurology and neuropsychology have enabled an informed ascription of emotions and minds to animals.[72]

Affective content accompanies stress. Those who say it is inappropriately anthropomorphic to ascribe emotional states such as stress to animals bear the burden of proof. If in a stressful environment a cow a) displays stressed behaviour like rapid breathing and an accelerated heart rate, b) releases cortisol and adrenaline, and c) has an amygdala where activity correlates with stress responses, it is plausible to infer that the cow is experiencing stress. If such an inference is illegitimate, the objector must say how it can be that the cow would not experience stress. But there is no such thing as a veterinarian who believes cattle cannot

[68] L. Daston, 'Intelligences: Angelic, Animal, Human', in L. Daston and G. Mitman (eds.), *Thinking with Animals: New Perspectives on Anthropomorphism* (New York: Columbia University Press, 2005), 37–38.
[69] Wynne, 'What Are Animals? Why Anthropomorphism is Still Not a Scientific Approach to Behavior', 126.
[70] N. Tinbergen, *The Study of Instinct* (Oxford: Oxford University Press, 1969 [1951]), 30.
[71] G. Romanes, *Animal Intelligence* (New York: D. Appleton & Co., 1883); C. Morgan, *Introduction to Comparative Psychology* (London: Walter Scott Ltd., 1914); J. Panksepp, *Affective Neuroscience: The Foundations of Human and Animal Emotions* (New York: Oxford University Press, 1998); M. Midgley, *Beast and Man* (London: Routledge, 2002); G. Bradshaw, *Elephants on the Edge: What Animals Teach Us about Humanity* (New Haven: Yale University Press, 2009); M. Bekoff, *The Emotional Lives of Animals: A Leading Scientist Explores Animal Joy, Sorrow, and Empathy — and Why They Matter* (California: New World Library, 2007); F. Karlsson, 'Critical Anthropomorphism and Animal Ethics', *Journal of Agricultural and Environmental Ethics* 25, 5 (2012), 707–20.
[72] Low, 'The Cambridge Declaration on Consciousness' 2012.

experience stress or fear. As some have noted, given the consciousness-generating neurological similarities between animals and humans, it would be a 'biological miracle' if humans alone were able to feel.[73]

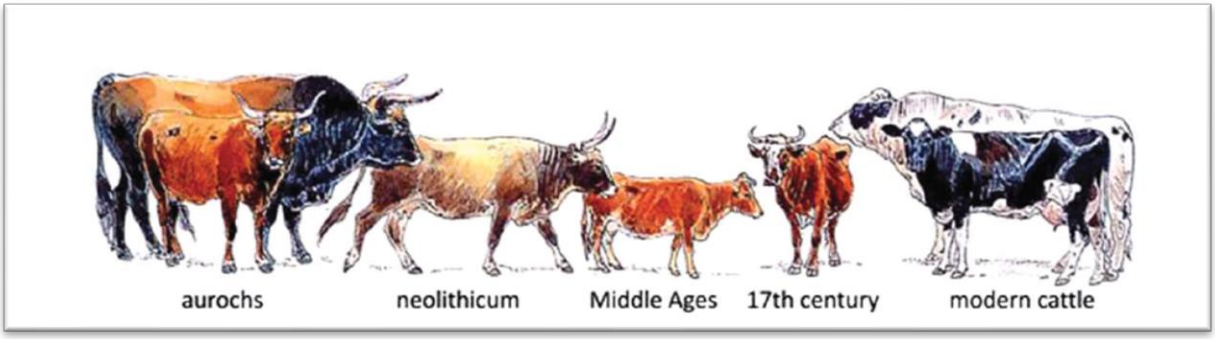
In sum, cattle share a wide range of neurochemicals and brain features with humans. Cattle can experience pain and pleasure, fear and stress, social connection, comfort and discomfort, anxiety, and panic; they see, taste, smell and feel. They have deep familial bonds with their kin. From these considerations, the next section sketches a history of cattle as experiential subjects from the agricultural revolution until they became increasingly connected to the lives of southern Africans from the second millennia CE.

From aurochs to cattle in southern Africa: a history of domestication until the eleventh century

Cattle history is usually conceived as having started ten thousand years ago, when herds of Aurochs, walked, grazed, and avoided or perished at the weapons of hunter-gatherers, on the plains of the Fertile Crescent and the Indian subcontinent. Aurochs, or *Bos primigenius,* were large bovines and are the forebearers of the two major cattle species Taurine (*Bos taurus*) and Indicine (*Bos indicus*), whose genes all modern cattle possess to some degree.[74]

[73] J. Masson and S. McCarthy, *Weep, When Elephants. The Emotional Lives of Animals* (New York: Delacorte Press, 1995), 15–16, 31.
[74] D. MacHugh, G. Larson, and L. Orlando, 'Taming the Past: Ancient DNA and the Study of Animal Domestication', *Annual Review of Animal Biosciences* 5 (2017), 330, 331; B. Arbuckle *et al*., 'Documenting the Initial Appearance of Domestic Cattle in the Eastern Fertile Crescent (Northern Iraq and Western Iran)', *Journal of Archaeological Science* 72 (2016), 1.

Image 1.7. From aurochs to modern cattle



Source: P. Ajmone-Marsan, J. Fernando Garcia, and J. Lenstra, 'On the Origin of Cattle: How Aurochs Became Cattle and Colonized the World', *Evolutionary Anthropology*, 19, 4 (2010), 149.

One of the most far-reaching and impactful events in the last 13 000 years has been the domestication of plants and animals by humans. The shift to human agriculture and farming, to sedentary human societies, over time radically transfigured animal and human lives. As domesticated animals, cattle came into existence via domestication and their history's chronology is thus tied closely to shifts in their relationships with humans. As we shall see later, when colonists used them for wagon labour, or developed veterinary regimes, or instituted industrialised slaughterhouses, or instituted modern breeding regimes, these human events marked transformations in cattle history.

Aurochs were likely first subjugated into domestic relations with humans in the Fertile Crescent, a region that includes parts of Syria and Turkey about ten millennia ago.[75] About two thousand years later, Aurochs were subjugated in South Asia.[76] Cattle emerged, and their culture and human culture was linked together, which fundamentally transformed the trajectories of both species. The domestication of cattle was of monumental importance for human and animal societies.

[75] Arbuckle *et al*., 'Documenting the Initial Appearance of Domestic Cattle in the Eastern Fertile Crescent', 1; MacHugh, Larson, and Orlando, 'Taming the Past: Ancient DNA and the Study of Animal Domestication', 331.
[76] MacHugh, Larson, and Orlando, 'Taming the Past: Ancient DNA and the Study of Animal Domestication', 331.

About 12 millennia ago, hunter-gatherers began to more vigorously pursue their control over plants and animals. The hunter-gatherers strove to domesticate plants and animals for resource acquisition and environmental reasons. The climate became unpredictable, big mammalian 'game' animal populations declined, and humans moved into viable habitats.[77]

In reply to food and climate unpredictability, and lower numbers of designated prey in connection to improved human hunting abilities, human diets broadened to include second and third choice foods such as smaller mammals, and plants that required some level of processing like grinding or soaking.[78] Humans later called this the 'broad-spectrum revolution'.[79] Wild plants, like wild cereals, for example, were taken into areas where humans could intentionally cultivate them.[80]

Cattle became domesticated by humans in two main separate events. Humpless *Bos taurus* cattle were domesticated in the Fertile Crescent around 8 350 BCE, ten millennia ago, and humped Zebu *Bos indicus* cattle were domesticated in South Asia 6 050 BCE, around eight millennia ago.[81]

According to Jared Diamond, there were 148 wild mammal species who weighed 45 kilograms or more and who may have been candidates for domestication.[82] But only 14 of these species were domesticated. It is remarkable that in the millennia following domestication in the Fertile Crescent, very few animals have since been domesticated, and despite sustained modern efforts, many species have proven practically impossible to domesticate. Examples include the eland, elk, moose, musk ox, and zebra.[83] By 4 000 BCE sheep, cattle, goats, pigs and horses were repeatedly domesticated. [84] Yuval Harari writes that:

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[77] J. Diamond, 'Evolution, Consequences and Future of Plant and Animal Domestication', *Nature* 418, 6898 (2002), 704.
[78] *Ibid*, 700–701.
[79] M. Zeder, 'The Broad Spectrum Revolution at 40: Resource Diversity, Intensification, and an Alternative to Optimal Foraging Explanations', *Journal of Anthropological Archaeology* 31, 3 (2012), 241.
[80] B. Gross and K. Olsen, 'Genetic Perspectives on Crop Domestication', *Trends in Plant Science* 15, 9 (2010), 530.
[81] D. MacHugh, G. Larson, and L. Orlando, 'Taming the Past: Ancient DNA and the Study of Animal Domestication', 3330–31.
[82] Diamond, 'Evolution, Consequences and Future of Plant and Animal Domestication', 702.
[83] *Ibid*, 706.
[84] *Ibid*.

> Even today, with all our advanced technologies, more than 90 per cent of the calories that feed humanity come from the handful of plants that our ancestors domesticated between 9500 and 3500 BC - wheat, rice, maize (called 'corn' in the US), potatoes, millet and barley. No noteworthy plant or animal has been domesticated in the last 2,000 years. If our minds are those of hunter-gatherers, our cuisine is that of ancient farmers.[85]

Jared Diamond proposes six features inherent to mammals who were not domesticated to explain why only 14 species were domesticated.[86] These features are: 1) a diet not readily and easily provided by humans (thus no domestic anteaters), 2) slow growth rate and long periods between birthing (elephants and gorillas), 3) propensity to use violence in self-defence (grizzly bears and rhinoceroses), 4) disinclination to breed in captivity (pandas and cheetahs), 5) absent follow-the-leader dominance hierarchies (bighorn sheep and antelope), 6) and proclivities for panic in enclosed captivity or when among predators (gazelles and deer, but not reindeer). The presence of any one of his six features is considered enough to prevent domestication.[87]

The Auroch possessed all six features. Cattle can eat a wide variety of plants and grasses, they mature quickly and have relatively short gestation periods, they are fearful and non-confrontational, meaning they do not readily engage in violent self-defence, they continue to breed in captivity, and they form herds and have leaders whom the herd follows. Further, from a human domination perspective, they are manageably calm in enclosures. Smaller, weaker, more passive and controllable Aurochs were likely selected for captivity and breeding. Their calm, non-confrontational, and easily fearful nature was thus used against them. Leaving plants aside, domestication of animals mainly involves captivity, control of sex and reproduction, and control of food supply. For the animals, domestication was therefore an institution of domination. In political philosophy terms, with the advent of farming, cattle and other domesticated animals were brought into human societies as a kind of subordinated caste group.[88]

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[85] Y. Harari, *Sapiens: A Brief History of Humankind* (London: Vintage Books, 2014), 88.
[86] Diamond, 'Evolution, Consequences and Future of Plant and Animal Domestication', 702.
[87] *Ibid*.
[88] S. Donaldson and W. Kymlicka, *Zoopolis: A Political Theory of Animal Rights* (New York: Oxford University Press, 2011), 101.

These captive and subjugated animals were then bred. Cattle were regarded as food (flesh), cows' secretions (milk) were extracted, their skin was used as forms of clothing or other items, and oxen were forced to perform labour. Cattle became regarded as one of the early forms of money and wealth; as the word livestock, living stock, indicates.[89] Albeit briefly, at least one historian has reflected on the agricultural revolution from the animals' perspectives. Contemplating the evolutionary success of domesticated animals, in terms of them presently existing in vast numbers, Yuval Harari argues that 'in the case of animals such as cattle, sheep and Sapiens, each with a complex world of sensations and emotions, we have to consider how evolutionary success translates into individual experience.'[90] In one of the most original claims in *Sapiens: a brief history of humankind* (2011), Yuval Harari writes that:

> from the viewpoint of the herd, rather than that of the shepherd, it's hard to avoid the impression that for the vast majority of domesticated animals, the Agricultural Revolution was a terrible catastrophe. Their evolutionary 'success' is meaningless. A rare wild rhinoceros on the brink of extinction is probably more satisfied than a calf who spends its short life inside a tiny box, fattened to produce juicy steaks. The contented rhinoceros is no less content for being among the last of its kind. The numerical success of the calf's species is little consolation for the suffering the individual endures.[91]

He speculates that animals like sheep were probably domesticated via one of two means.[92] Sheep communities were probably corralled into narrow gorges, where they could be observed and monitored. Old, sick sheep and adult rams were killed, while lambs were protected to promote the longevity of the herd.[93] Lions, wolves, and rival human tribes were repelled. Defensively aggressive sheep, who resisted human control, or, wandering sheep, whose curiosity led them away from the herd, were slaughtered first. 'With each passing generation', writes Yuval Harari, 'the sheep became fatter, more submissive and less curious.'[94] Alternatively, hunters could have trapped and then adopted lambs, fattened them, and then slaughtered them. Over time the number of sinister adoptions likely increased.

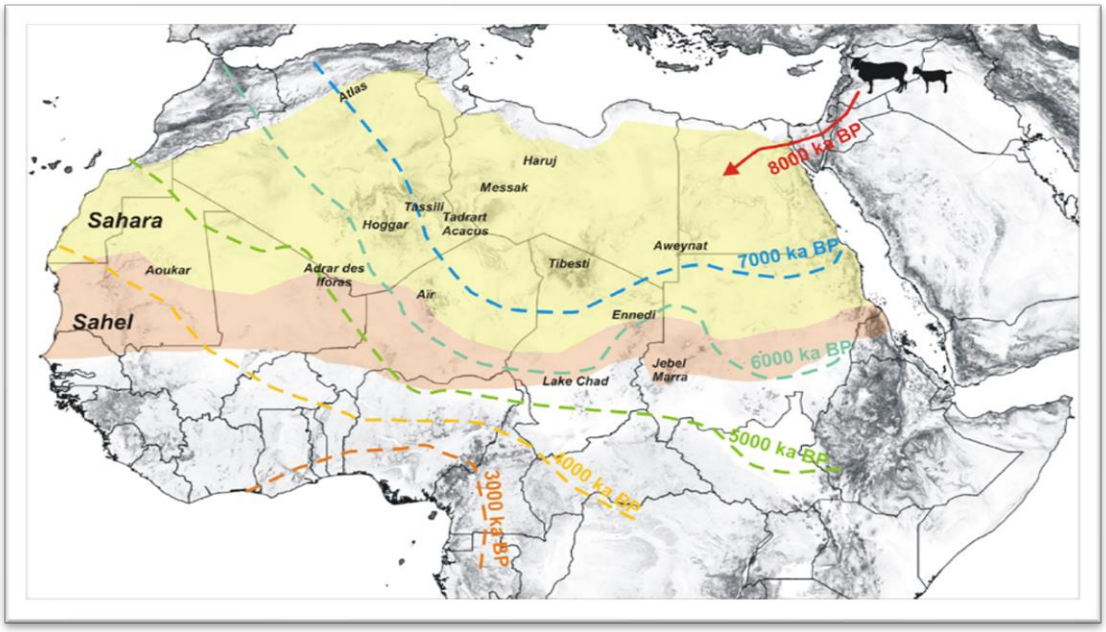
[89] See Introduction chapter.
[90] Harari, *Sapiens*, 109.
[91] *Ibid*.
[92] *Ibid*, 102–4.
[93] *Ibid*, 103.
[94] *Ibid*.

> Some of these [lambs] reached puberty and began to procreate. The most aggressive and unruly lambs were first to the slaughter. The most submissive, most appealing lambs were allowed to live longer and procreate. The result was a herd of domesticated and submissive sheep.[95]

He concludes that the 'domestication of animals was founded on a series of brutal practices that only became crueller with the passing of the centuries.'[96] For the few animal species who were domesticated, their trajectories changed dramatically for the worse.

Archaeological evidence suggests that cattle in herding relationships with humans moved from the Levant, the Eastern Mediterranean region of Western Asia, into North Africa, the Nile Valley, and the Sahara between circa 6 350 BCE and 4 050 BCE, while goats and sheep were likely herded in this region from around 5 850 BCE.[97]

Image 1.8. Cattle and ovicaprine movement in north Africa



Source: A. Zerboni and K. Nicoll, 'Enhanced Zoogeomorphological Processes in North Africa in the Human-Impacted Landscapes of the Anthropocene', *Geomorphology* 331 (2019), 24.

[95] *Ibid*, 104.
[96] *Ibid*, 105.
[97] A. Zerboni and K. Nicoll, 'Enhanced Zoogeomorphological Processes in North Africa in the Human-Impacted Landscapes of the Anthropocene', *Geomorphology* 331 (2019), 25.

Movements of humans into north Africa, from the Levant into the Nile Delta, and then into the Western Desert, likely occurred via the land barrier and through contemporary Palestine or across the Red Sea.[98] These cross-continent movements implied possibilities for exchanging animals and also learning methods for controlling and herding animals.[99] In Africa, the earliest known domesticated caprines, or goat-antelopes, were found at Sodmein Cave on the Red Sea coast in Quseer in Egypt, and it is presumed that they were probably introduced into the area around 6 200 BCE.[100]

Cattle in domestic relationships with herders, who spread across North-east and northern Africa, were descendants of *Bos taurus,* who were domesticated in the Middle Euphrates region of the Middle East.[101] Previously there were debates about a potential independent domestication of cattle in north Africa, but larger DNA sample sizes have suggested that there was no third domestication of cattle in Africa.[102] Herding operations extended intermittently across the region and manifested in 'spotty distribution[s]' of small pastoralist groups.[103] Cattle herding expanded across the majority of North Africa. By around 9 000 BCE cattle, goats, and sheep were evident over a large part of North Africa.[104] According to some archaeologists, an arid climatic phase around 8 000 BCE likely moved herders into ecologically viable areas in the region.[105]

In the Sahara, cattle pastoralism correlated with increased human populations.[106] Indicators from archaeological records like rock art, funerary institutions, settlements, pottery decorations, and radiocarbon dating suggest that cattle, goats, sheep, and humans had

[98] M. Brass, 'Early North African Cattle Domestication and Its Ecological Setting: A Reassessment', *Journal of World Prehistory* 31, 1 (2018), 108.
[99] *Ibid*.
[100] P. Vermeersch *et al*., 'Early and Middle Holocene Human Occupation of the Egyptian Eastern Desert: Sodmein Cave', *African Archaeological Review* 32 (2015), 487.
[101] Brass, 'Early North African Cattle Domestication and Its Ecological Setting', 81.
[102] *Ibid*, 81, 109.
[103] Zerboni and Nicoll, 'Enhanced Zoogeomorphological Processes in North Africa in the Human-Impacted Landscapes of the Anthropocene', 25; S. di Lernia, 'The Emergence and Spread of Herding in Northern Africa: A Critical Reappraisal', in P. Mitchell and P. Lane (eds.), *Oxford Handbook of African Archaeology* (Oxford: Oxford University Press, 2013), 527–40.
[104] di Lernia, 'The Emergence and Spread of Herding in Northern Africa: A Critical Reappraisal', 532.
[105] *Ibid*, 535.
[106] K. Manning and A. Timpson, 'The Demographic Response to Holocene Climate Change in the Sahara', *Quaternary Science Reviews* 101 (2014), 32–34.

spread across the Sahara and the Sahel by around 5 000 BCE.[107] Savino di Lernia notes that 'the spread of herding-related realities [were] of immense importance to the subsequent history of African societies'.[108] It took several thousand years for cattle, sheep and goats to reach southern Africa.

Sheep bones from around two millennia ago have been discovered in Namibia.[109] Cattle appeared in southern Africa, specifically in Toteng in Botswana, around 2 000 years ago and were in the Cape of South Africa about 300 years later.[110] Archaeological evidence suggests that cattle and human relationships started to develop in southern Africa from the fourth to the ninth century CE, with the movement of Eastern Bantu-speaking groups into regions including the Eastern Cape.[111] Evidence of pastoralism – defined as a human social system focused on controlling and using domesticated mammals like goats, sheep and cattle – in the southern African Late Stone Age in the first millennium CE is rare, arguably to the point of being absent.[112] Domesticated animals like sheep, goats and cattle were likely not the basis of human societies in the first millennium CE, and as 'food' unlikely contributed more than marginally to southern African human diets.[113]

Sanga types of cattle comprise the majority of southern Africa's cattle genetics.[114] It is thought that Sanga emerged from African taurine and zebu cattle breeding in Ethiopia in 700 CE.[115] The Sanga type includes the Nguni, Africander, and Drakensberger of South Africa, the Sanga

[107] D. Gifford-Gonzalez, 'Animal Disease Challenges to the Emergence of Pastoralism in Sub-Saharan Africa', *African Archaeological Review* 3, 17 (2000), 99.
[108] di Lernia, 'The Emergence and Spread of Herding in Northern Africa: A Critical Reappraisal', 527.
[109] D. Pleurdeau *et al*., '"Of Sheep and Men": Earliest Direct Evidence of Caprine Domestication in Southern Africa at Leopard Cave (Erongo, Namibia)', *PLOS ONE* 7, 7 (2012), 1.
[110] L. Robbins *et al*., 'The Advent of Herding in Southern Africa: Early AMS Dates on Domestic Livestock from the Kalahari Desert', *Current Anthropology* 46, 4 (2005), 673–74.
[111] Gifford-Gonzalez, 'Animal Disease Challenges to the Emergence of Pastoralism in Sub-Saharan Africa', 105.
[112] K. Sadr, 'A Short History of Early Herding in Southern Africa', in M. Bollig, M. Schnegg, and H-P. Wotzka (eds.), *Pastoralism in Africa: Past, Present and Future* (New York: Berghahn, 2013), 172.
[113] K. Sadr, 'A Short History of Early Herding in Southern Africa', 172–179.
[114] E. Gororo *et al*., 'Genetic Diversity in Zimbabwean Sanga Cattle Breeds Using Microsatellite Markers', *South African Journal of Animal Science* 48, 1 (2018), 128; S. Makina *et al*., 'Insight into the Genetic Composition of South African Sanga Cattle Using SNP Data from Cattle Breeds Worldwide', *Genetics Selection Evolution* 48, 88 (2016), 6.
[115] Gororo *et al*., 'Genetic Diversity in Zimbabwean Sanga Cattle Breeds Using Microsatellite Markers', 129.

of Namibia, the Nguni of Eswatini and Zambia, the Mashona, Nkone, and Tuli of Zimbabwe, and the Landim of Mozambique.[116]

The debate about how cattle came to southern Africa, the Kalahari debate, remains unsettled. Two main routes from two sets of scholars are proposed, although limited evidence for each route has meant neither group has presented a watertight case.[117] Jim Denbow and Edwin Wilmsen argue that Khoi and San speakers adopted cattle from Bantu groups in the Okavango Delta and made their way to southern Africa via the Kalahari.[118] While their evidence is slim, these scholars and others contend that the desert conditions imply that preserved archaeological evidence is unlikely. Jim Denbow's excavations at Nqoma and Divuyu and his reconstruction of networks that linked Toutswe sites in Botswana suggest circumstantially that political economies in the desert could have included nomadic pastoralists. This view may be called the Kalahari route. The other view is proposed by Karim Sadr, who argues that the Kalahari route's evidence is too thin, and suggests that cattle-keeping specialisations of contemporary Bantu-speakers implies that cattle were passed among Bantu-speakers who lived along the edge of the Kalahari Desert.[119]

Pastoralism in southern Africa, the eleventh to the seventeenth century

Sheep and goats appeared in southern Africa about two thousand years ago, and it has been argued that hunter-gatherers were using them to supplement their subsistence and not as primary forms of food.[120] Keeping such animals likely did not dramatically shift their culture to that of pastoralists. Archaeologist Karim Sadr has usefully tabled the number of cattle,

[116] *Ibid*.
[117] R. Jimenez, 'Rites of Reproduction: Gender, Generation and Political Economic Transformation among Nguni-Speakers of Southern Africa, 8th - 19th Century CE' (PhD Dissertation, Northwestern University, Illinois, 2017), 107.
[118] J. Denbow and E. Wilmsen, 'Advent and Course of Pastoralism in the Kalahari', *Science* 234, 4783 (1986), 1509–15; J Denbow, 'A New Look at the Later Prehistory of the Kalahari', *The Journal of African History* 27, 1 (1986), 3–28; C. Ehret, 'The Early Livestock-Raisers of Southern Africa', *Southern African Humanities* 20 (2008), 7–35; Robbins *et al*., 'The Advent of Herding in Southern Africa.'
[119] C. Cooke, 'Evidence of Human Migrations from the Rock Art of Southern Rhodesia', *Africa: Journal of the International African Institute* 35, 3 (1965), 263–285; J. Kinahan, 'A New Archaeological Perspective on Nomadic Pastoralist Expansion in South-Western Africa', *Azania: Archaeological Research in Africa* 29–30, 1 (1994), 211–226; K. Sadr, 'Kalahari Archaeology and the Bushman Debate', *Current Anthropology* 38, 1 (1997), 104–112; P. Mitchell, *The Archaeology of Southern Africa* (Cambridge: Cambridge University Press, 2002).
[120] Sadr, 'A Short History of Early Herding in Southern Africa', 171–172.

sheep, and goat bones from archaeological sites in southern Africa dating to the last 2 000 years.[121] What emerges strongly from his analysis is that in the Late Stone Age pastoralism was likely absent. In Iron Age sites kraals were central features but were not in Late Stone Age sites. The low proportion of bones in most southern African Late Stone Age sites suggest that goats, sheep and cattle contributed only marginally to the diets of Late Stone Age humans.[122]

There is some evidence that cattle-keeping human economies appeared in southern Africa from around 400 to 900 CE.[123] There is evidence from Namibia suggesting that from this time, cattle were in 'quite intensive' pastoral relationships, in that transhumance and cattle posts occur in the material record.[124] There is evidence of animal kraals in the Karoo in South Africa from the eleventh century, but they were not located at the centre of settlements and their ideological and economic significance to humans is difficult to determine.[125] By the seventeenth and eighteenth centuries CE, cattle appear to have been in pastoralist relationships across the Cape region of South Africa, in that kraals were at the centre of settlements and human movements followed the grazing needs of cattle, goats and sheep.[126] A site at the Vredenburg Peninsula in South Africa indicates that such pastoralists may have been using domesticated animals a few centuries earlier.[127] There is some scholarship on why and in what ways hunter-gatherers came to be in pastoralist relationships with cattle but overall little is known.[128]

Recent important work by Raevin Jimenez, which used comparative linguistics as a method to examine historical shifts among Nguni-speakers, has provided some insight into how cattle came to be increasingly part of Proto-Nguni speakers' worlds, particularly in the second millennium CE. Nguni speakers comprise among others Xhosas, Zulus, Swazis, and Southern

[121] *Ibid*, 172–179.
[122] *Ibid*, 179.
[123] Gifford-Gonzalez, 'Animal Disease Challenges to the Emergence of Pastoralism in Sub-Saharan Africa', 105.
[124] Sadr, 'A Short History of Early Herding in Southern Africa', 188; J. Kinahan, *Pastoral Nomads of the Namib Desert: The People History Forgot* (Windhoek: Namibia Archaeological Trust, 2001).
[125] Sadr, 'A Short History of Early Herding in Southern Africa', 188.
[126] *Ibid*.
[127] F. Fauvelle-Aymar *et al*., 'The Visibility and Invisibility of Herders' Kraals in South Africa, with Reference to a Possible Early Contact Period Khoekhoe Kraal at KFS 5 (Western Cape)', *Journal of African Archaeology* 4, 2 (2006), 253.
[128] Sadr, 'A Short History of Early Herding in Southern Africa', 188.

Ndebele.[129] Proto-Nguni are an 'intermediate subgroup' of the Southern Bantu, and the Southern Bantu are the ancestors of Sotho-Tswana, Shona, Tswa-Ronga, and Venda.[130]

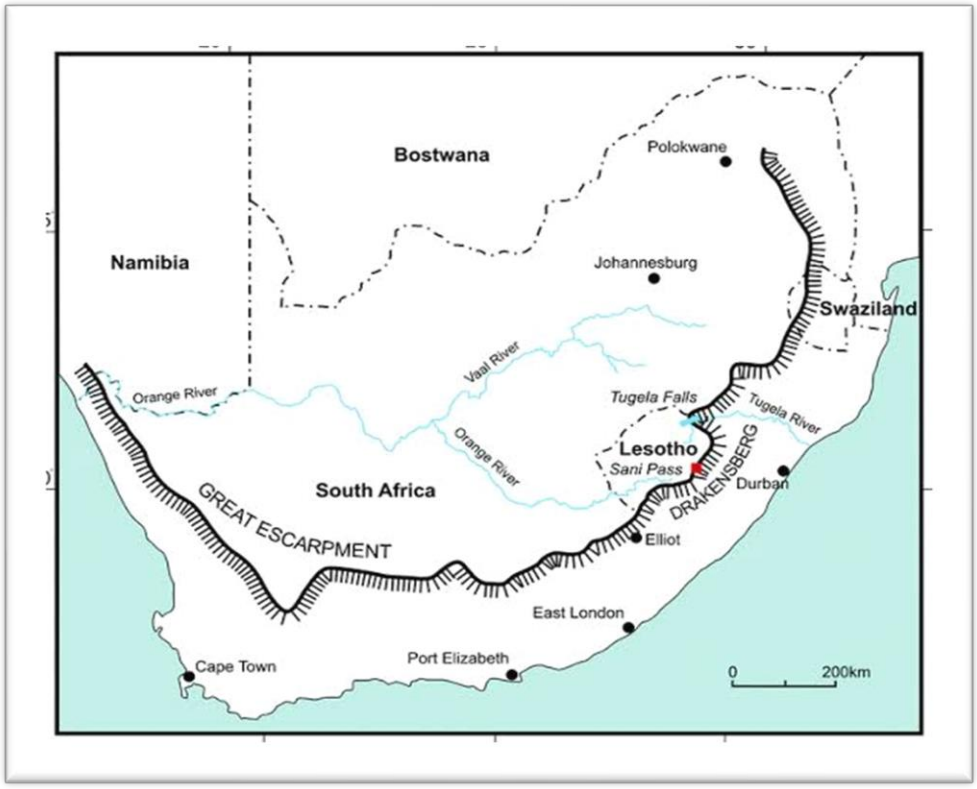
Raevin Jimenez argues that Proto-Nguni speakers did not arrive in South Africa with a suite of specialised breeding-and animal controlling-related concepts.[131] Rather, such terms were innovated in relation to how the lives and roles of women and men and cattle were increasingly controlled in emerging political systems.[132]

At the end of the first millennium CE, when Proto-Nguni speakers moved from the Highlands of present-day South Africa, into the Grasslands, along the southern side of the Drakensberg escarpment, Proto-Nguni speakers had a set of root words and generic terms for cattle and goats, which implies their and their predecessors' familiarity with these animals.[133] On the basis that Proto-Nguni speakers and the Southern Bantu lacked a lexical range for cattle and goat breeding, Raevin Jimenez argues that it is doubtful that such people were actively breeding goats and cattle before they appeared south of the Drakensberg Escarpment. Animal breeding taxonomies, or the concepts associated with cattle-keeping and animal breeding, appear in the vocabularies of Proto-Nguni speakers after the 9th century.[134] If Proto-Nguni were breeding, herding, and extensively using domesticated animals before the ninth century CE, they did not have the concepts semantically linked to such practices and relationships. So, in the first millennium CE, while cattle and goats were conceptualised in Proto-Nguni speakers' language, such animals were unlikely purposively bred in anything like pastoral or animal keeping systems. This comparative historical linguistics evidence coheres with the low proportion of domesticated animals in archaeological sites.[135]

[129] I. Schapera, *The Bantu-Speaking Tribes of South Africa; an Ethnographical Survey* (London: Routledge & Sons, Ltd, 1937), 23; S. Bosch, L. Pretorius, and A. Fleisch, 'Experimental Bootstrapping of Morphological Analysers for Nguni Languages', *Nordic Journal of African Studies* 17, 2 (2008), 67.
[130] R. Jimenez, '"Slow Revolution" in Southern Africa: Household Biosocial Reproduction and Regional Entanglements in the History of Cattle-Keeping among Nguni-Speakers, Ninth to Thirteenth Century CE', *The Journal of African History* 61, 2 (2020), 161.
[131] Jimenez, 'Rites of Reproduction', 105.
[132] Jimenez, 'Rites of Reproduction' 12, 14–15, 31, 33–35; Jimenez, '"Slow Revolution" in Southern Africa', 160, 175.
[133] Jimenez, 'Rites of Reproduction', 105.
[134] *Ibid*.
[135] Sadr, 'A Short History of Early Herding in Southern Africa', 188–89.

Between 1 000 and 1 500 CE, Proto-Nguni speaking groups separated, and communities extended across the Grasslands area, which 'occurs mainly on the high central plateau (Highveld), the inland areas of the eastern seaboard, the mountainous areas of KwaZulu-Natal and the central parts of the Eastern Cape'.[136] Nguni-speakers developed a lexicon for signifying human and animal genders in terms of biological reproduction. These lexical items were semantically related to kinship and rites of passage, and included concepts for more intensive cattle-keeping and cattle breeding. For the Nguni-speakers, political systems were innovated and developed, and cattle were drawn increasingly and more intensively into the social, economic and political worlds of Nguni-speaking southern Africans.[137]

Image 1.9. Drakensberg Escarpment



Source: S. Grab, 'Drakensberg Escarpment: Mountains of Geomorphic Diversity', in P. Migon (ed.), *Geomorphological Landscapes of the World* (Dordrecht: Springer Netherlands, 2010), 134.

[136] L. Mucina *et al*., 'Grassland Biome', in L. Mucina and M. Rutherford (eds.), *The Vegetation of South Africa, Lesotho and Swaziland* (Pretoria: South African National Biodiversity Institute, 2006), 31.
[137] Jimenez, 'Rites of Reproduction', 31.

Drawing on Jan Vansina's concept of slow revolution, which he used to analyse the shift to farming in west Africa, Raevin Jimenez argues that especially from 1 000 to 1 200 CE, Nguni societies underwent a 'slow social revolution' towards becoming more intensive cattle-keeping societies.[138] As cattle increasingly became forms of social wealth, males' roles within the household and community shifted towards including herding responsibilities.[139] Raevin Jimenez writes that 'cattle-keeping became an institution through which Nguni-speakers reproduced social relations and practices'.[140]

From archaeological sources and comparative linguistic analyses, it is difficult to directly access the subjective experiences of cattle as they moved around southern Africa and became increasingly embroiled and significant in human societies. However, the concepts linked to human and cattle relationships indicate the respects in which cattle were conceived of among Nguni speakers. The concepts with which humans referred to cattle allow us to make some plausible inferences about shifts in cattle history, as they came to be central to many southern Africa human societies over the last thousand years. To this end, I selected a number of terms innovated by Proto-Nguni speakers, which Raevin Jimenez has reconstructed via a comparative historical linguistics approach.

The Southeast Bantu root words 'komo' for 'cattle' and '-vù' for sheep are shared by Khoekhoe herders and Proto Southeast Bantu speakers.[141] The transfer of the term 'komo' may have occurred between Khoekhoe herders and Southeast Bantu speakers, the former migrating from the Shashe-Limpopo Basin to the Cape.[142]

Nguni speakers share terms for the age and gender of animals. This suggests that these animals were intentionally bred and thus that their human masters were not totally reliant on trafficking such animals. Reconstructions of innovated root words such as 'kunzi', 'male animal', '-kabi', meaning 'steer, ox, bullock' and '-tole' which means 'heifer and unweaned

[138] Jimenez, '"Slow Revolution" in Southern Africa', 155, 160, 175; J. Vansina, 'A Slow Revolution: Farming in Subequatorial Africa', *Azania: Archaeological Research in Africa* 29, 1 (1994), 15–26.
[139] Jimenez, '"Slow Revolution" in Southern Africa', 157.
[140] *Ibid*, 160.
[141] Jimenez, 'Rites of Reproduction', 109. Compare this etymology to the etymology of the English word cattle in the Introduction chapter.
[142] *Ibid*, 109.

calf', suggest that these terms emerged during the Proto Nguni period.[143] The term 'kunzi' meaning male animal, domestic or free, and taxonomies for the terms are nearly identical for cattle, sheep and goats.[144]

Terms for steer and bullock imply that animals were castrated. Proto Nguni speakers inherited the term -pakul-', 'to castrate', implying some knowledge of animal keeping.[145] Herders castrated goats, sheep or cattle to restrict sex and reproduction and likely to reduce defensive aggression. Male animals were castrated by Proto-Nguni speakers. Some of their descendants, Proto-Southern Nguni speakers innovated a different form of castration, namely '*-thên' meaning to 'castrate (by cutting)'.[146] The root '*-thên' is derived from a prior Bantu root term '*-téen', 'to cut', which suggests that herders and animal keepers were innovating the ways they controlled the sexual lives of animals.[147] Domesticated male animals, including bulls, have likely been castrated for the last ten millennia.[148]

Proto-Nguni speakers innovated the root word '*-lus' meaning 'to herd; herder' which signals a dramatic shift for cattle, suggesting that cattle herds, their social systems, came to be controlled, 'herded', by specific human masters, 'herders'.[149] They also innovated the root word '*-hlambi', meaning 'herd of animals'.[150] So too did Proto-Ngunis innovate the term for kraal '*-baya'. The term 'kraal' is not species-specific so that a cattle-only kraal is 'isibaya senkomo'.[151]

Distinguishing between life stages of animals implies that Proto-Nguni speakers were conceiving of cattle as beings in time, beings who had distinct ages. 'Heifer, or unweaned calf, is signified by the innovated polysemic '*tole', which suggests an important distinction between bulls and smaller animals.[152] The innovation of the term 'heifer' may also suggest an

[143] *Ibid*, 110.
[144] *Ibid*, 110–11.
[145] *Ibid*, 112.
[146] *Ibid*, 118.
[147] *Ibid*.
[148] Harari, *Sapiens*, 448.
[149] Jimenez, 'Rites of Reproduction', 116; Jimenez, '"Slow Revolution" in Southern Africa', 164.
[150] Jimenez, '"Slow Revolution" in Southern Africa', 164.
[151] Jimenez, 'Rites of Reproduction', 112.
[152] *Ibid*, 110.

interest in the longevity of young animals and the reproductive capacity of mothers. Young calves who are weaned are called 'inkonyama', meaning small cows. [153]

In the eyes of their human masters, cattle also transformed into beings of value, control over whom comprised wealth for cattle's masters. Human masters, herders, and cattle, sheep and goat keepers, were described by the root word '*-fúyi', meaning 'to accumulate, be wealthy, to breed'.[154] That the term is polysemic and suggests that Proto-Nguni speakers saw that purposive breeding of herds was a prospective route to wealth. This connects to the etymology of the English word cattle, in that cattle initially meant money among English and Latin speakers.

Significant from a bovine perspective is that Proto-Nguni speakers used the root term '*phάwu' meaning 'to notch ear', which implies that cattle were conceived of as property who could be owned.[155] In combination with *-fúyi', meaning to be wealthy, to accumulate and to breed, a concept of ear notching, Raevin Jimenez argues, suggests that some form of property rights obtained, and that cattle goats and sheep were owned.[156]

Proto-Nguni-speakers innovated a new root '*-dle', which meant 'pastureland, wild place, parturition', but referred both to land that herded animals could graze and bodies of women who were soon to produce or had recently produced a human child.[157] Proto-Nguni speakers likely expanded their use of cattle 'products'. They derived the term *-bísì, 'milk' from the earlier Bantu word *-bÍcÌ, which meant 'unripe, uncooked, fresh' and innovated the word '*-senga' which means 'to milk an animal'.[158] They had inherited the term *-mâsi which meant 'sour milk'.[159] Proto-Drakensberg speakers innovated the root '*-tunga', meaning 'milking pail', in the eleventh century.[160]

[153] *Ibid*, 111.
[154] *Ibid*, 116.
[155] *Ibid*.
[156] Jimenez, '"Slow Revolution" in Southern Africa', 164; Jimenez, 'Rites of Reproduction', 116.
[157] Jimenez, 'Rites of Reproduction', 117.
[158] Jimenez, '"Slow Revolution" in Southern Africa', 164.
[159] *Ibid*.
[160] Jimenez, 'Rites of Reproduction', 114.

Proto Nguni speakers also innovated the root '*-sìnda', to smear a dung floor, which derived from an earlier root '*-cìng', which means to rub, to smear.[161] In the late second millennium CE, Swati, Zimbabwean Ndebele, Hlubi and Zulu-speakers developed an areal form that specified 'dry cattle dung' using the root '*-quba'.[162] Proto Ngunis also had root words for 'animal hide' and 'dried' meat. This means that Proto-Ngunis saw cattle as beings whose skin could be used and whose flesh could be eaten after either slaughter or natural death.[163]

Animals also came to be seen as beings who could be barren, suggesting that humans were becoming interested and invested in their reproductive capacities. 'Barren', for Proto-Nguni-speaking ancestors, was signified by the root '*-yùmbà', but Proto-Southern herders innovated the root '*-dlólo', which means 'barren animal'.[164] The emergence of this concept further suggests a heightened interest in the sexual and reproductive lives of goats, sheep, and cattle, indicating that attention was paid to the sexual control of these animals. Control of cattle led to unequal power dynamics that were common from the early- to mid-second millennium, and increasingly started to inform southern African political institutions.[165]

The conceptual tools innovated by Proto-Nguni, Proto-Drakensberg, Proto-Southern and Proto-Northern speakers indicate that Proto-Nguni speakers had a 'basic familiarity' with domesticated animals during the first millennium and in that period 'laid the ideological and practical groundwork for a livestock-keeping lifestyle that subsequent generations tailored to their needs.'[166] For cattle, goats, and sheep this meant that their sexual lives were increasingly controlled, and they became seen as property and reproducible assets. Nguni speakers developed tools and concepts for dominating cattle, sheep and goats, in breeding and herding regimes locally, or *in situ*, while adapting to their environments and incorporating animal subjects into their lifestyles and social and political systems across southern Africa.[167] They did not arrive in the region with 'livestock technology'.[168] Cattle became increasingly central

[161] *Ibid*, 114–15.
[162] *Ibid,* 115.
[163] *Ibid*, Jimenez, '"Slow Revolution" in Southern Africa', 164.
[164] Jimenez, 'Rites of Reproduction', 119.
[165] *Ibid*, 125.
[166] *Ibid*, 119.
[167] Jimenez, '"Slow Revolution" in Southern Africa', 156, 167, 171.
[168] Jimenez, 'Rites of Reproduction', 105.

to many southern African human communities over the next several centuries. As explored in Chapter Five, for cattle, shifts towards modernised breeding occurred especially from the early twentieth century in what became South Africa, and a few decades later in colonial Botswana.

From the fifteenth to the seventeenth century, political traditions in the region, writes Paul Landau, 'developed out of a wider, connective process bringing people and ideas together over long distances.[169] By the time the Dutch settlers arrived at the Cape the southern African region was home to many different cattle, and cattle were entrenched in social, political, economic, and spiritual systems of many groups across the region. In addition to the Sanga types listed earlier, there were Tswana, Damara, Ovambo, Bapedi, Bolowana, and Basuto breeds.[170]

Conclusion

This chapter comprised three parts. First, by drawing on diverse disciplines and literatures, it introduced cattle as social and experiential beings. This was undertaken because this thesis aims to approximate a cattle perspective of colonialism by presenting cattle as subjects, as beings with minds and experiences. Second, it sketched a history of cattle from the agricultural revolution until they appeared in southern Africa. Third, it drew on Raevin Jimenez' research to show changes in how cattle were conceived of and their positions in southern African Nguni-speaking societies, especially from the eleventh century CE. The next four chapters comprise the empirical core of this thesis. They examine the impacts of colonialism on cattle's subjective experiences, in terms of oxen's forced wagon labour, the impact of cattle diseases and veterinary regimes, the emergence of industrialised slaughterhouses, and colonial and modernised breeding regimes. I proceed now to explore a cattle-centred history of colonialism in southern Africa.

[169] P. Landau, *Popular Politics in the History of South Africa, 1400–1948* (Cambridge: Cambridge University Press, 2010), 72.
[170] A. Smith, 'The Origins of Domesticated Animals of Southern Africa', in R. Blench and K. MacDonald (eds.), *The Origins and Development of African Livestock: Archaeology, Genetics, Linguistics, and Ethnography* (London: UCL Press, 2000), 224.

Chapter Two: Oxen as colonial wagon labourers in southern Africa, 1653–1890s

Introduction

> A farmer at the bottom of the ascent stood ready with twelve fine, stout, beautiful oxen, with horns which spread from pole to pole, ready to be put to the wagon. Sensible creatures they seemed to be, for they did much dislike the business they were going on, and lowed piteously when they found themselves in the yoke.[1] – Anne Barnard

> The labour of riding these wearied beasts can hardly be conceived. A tired horse is bad enough, but an ox is beyond description; no amount of flogging suffices to lift him for a dozen yards into a heavy trot, and nothing is left for it but to sit with aching spine and patient endurance while he plods along the interminable road.[2] – Thomas Baines

> The companion of the ox we slaughtered refused food for two days, and went lowing about for him continually. He seemed inconsolable for his loss, and tried again and again to escape back to the Makololo country. My men remarked, 'He thinks, they will kill me as well as my friend.'[3] – David Livingstone

A little over a year after the Dutch East India Company (VOC) landed at the Cape of Good Hope, they developed *in situ*, makeshift wagons, loaded them with timber from the forests on the Table Mountain slopes near Kirstenbosch, and compelled horses and castrated male cattle, oxen, to pull these freighted wagons to and from the harbour, where the VOC was building a fort and establishing its base.[4] That is, one of the earliest things the VOC did was force animals to work for them. The yoke was utterly new in the region. Cattle's new form of labour profoundly impacted the experiences of cattle and the development of southern Africa. Wagon labour was for cattle a major colonial impact, and is the focus of this chapter. For over 200 years after the VOC arrived at the Cape, cattle – yoked into wagons, impelled forward with shouting, whistling, whips, and sometimes knives – would provide the primary mode of colonial transport. In 1700 burgers controlled 8357 cattle.[5] By 1875 in the Cape, other

[1] A. Barnard, *South Africa a Century Ago (1797 - 1801)* (Cape Town: Maskew Miller Limited, n.d), 160.
[2] T. Baines, *Explorations in South-West Africa* (London: Longman, Green, Longman, Roberts, & Green, 1864), 140.
[3] D. Livingstone, *Missionary Travels and Researches in South Africa* (London: John Murray, 1857), 322.
[4] J. Burman, *Towards the Far Horizon: The Story of the Ox-Wagon in South Africa* (Cape Town: Human & Rousseau, 1988), 15.
[5] *Ibid*, 35.

eastern districts, and Basutoland, of the 1 111 713 cattle counted by the census, 421 762 oxen were employed as draught labourers.[6] For over two centuries, drudging across the region, initially by following extant animal pathways – including those of elephants and other large mammals – cattle wagon labourers carved out routes that connected the region and that would later become the region's motorcar roads.[7]

In keeping with this thesis' objective to explore major impacts of colonialism on cattle's experiences, this chapter gives an account of different aspects of cattle's experiences as wagon labourers from the mid-seventeenth until the mid-nineteenth century. It also provides a general regional history of oxen wagon transport until the late nineteenth century, and offers a periodisation of cattle as wagon-labourers. This chapter's evidence is diverse and comprises published accounts of scientific and other travellers, a few missionaries, military officials' accounts, contemporaneous documents, and secondary literature. The chapter demonstrates cattle's contribution to the development of southern Africa, in particular as wagon road makers, and transporters, all of which enabled and expanded settlement and trade in the region, including the exploitation of mineral resources. Until the late nineteenth century, all colonial settlement was premised upon oxen's wagon labour. As per the previous two chapters, cattle are conceived of as sentient beings who possess agency.[8]

This chapter comprises three sections. The first section introduces the topic, discusses wagon histories of South Africa, and discusses interpretations of southern African travellers' and explorers' accounts. The second section describes the introduction of wagon labour as a colonial impact from the mid-seventeenth century, focusing on shifts in cattle's modes of labour and experiences until the turn of the nineteenth century, when wagon labour decreased. It offers vignettes of oxen subjectivity by reading contemporary, first-hand accounts of oxen's wagon labour in conjunction with a theory of animal agency where agency is regarded as an experiential species-characteristic striving towards one's good. The third section focuses on the nineteenth century and demonstrates the contributions of oxen's

[6] S. Silver and Co, *S. W Silver & Co's Handbook to South Africa* (London: S. W Silver & Co, 1880), 253.
[7] M. Mitchell, 'Setting the Scene: A Brief History of Transport Infrastructure in South Africa up to the End of the 20th Century', *Civil Engineering* 22, 1 (2014), 37.
[8] See Chapter One for the conception of agency.

forced labour to connecting the region, facilitating settlement and trade, and enabling the initial phases of the mineral revolution. It also offers some vignettes of oxen's subjectivity.

Various texts investigate the use of wagons in opening up the interior of southern and South Africa to colonial intrusion. Thomas Bulpin's amateur popular histories, *Lost trails of the low veld* (1950), *Lost Trails of the Transvaal* (1956), and *The Great Trek* (1969) discuss wagon routes and the use of oxen labour, while the latter presents trekkers as brave pioneers overcoming adversity through grit and hardiness in a harsh and hostile interior.[9] However, these texts do not include references, and are often marked by a pro-settler bias. They are uninterested in the lives and experiences of the cattle themselves. Some scholarship has been interested in wagons as a form of draught power, and usefully provides historical details but lacks an interest in the actual oxen and their experiences.[10] Nonetheless, there are some mentions of oxen's welfare as wagon pullers. Jose Burman notes that the 'horror-stricken descriptions of the old wagon roads' in the Cape came from travellers, not locals, which he interpreted to mean that trekboers, for example, accepted the hard roads as a fact of southern African life.[11] He arranged over 40 excerpts from travellers' harrowing accounts of oxen transiting 15 different kloofs or mountain passes.[12] Bruce Joubert mentions that oxen's mistreatment was not uncommon, was associated with poorly trained staff, animals, or both, and absent legislation.[13] Finally, Donald Morris' account of nineteenth century Zulu political expansion and the Anglo-Zulu war included passages on oxen's death rates, and working conditions of oxen wagon pullers, including them drowning while crossing rivers, whole teams being struck by lightning while yoked, and freighting heavy loads for over eight hours a day, which then required several days for the oxen to recover.[14] While other mentions exist, they are made in passing.

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[9] T. Bulpin, *Lost Trails of the Transvaal* (Cape Town: Books of Africa Party, 1983); T. Bulpin, *Lost Trails of the Low Veld* (London: HB Timmins for Hodder & Stoughton, 1950).
[10] B. Joubert, 'An Historical Perspective on Animal Power Use in South Africa', in P. Starkey (ed.), *Animal Power in South Africa: Empowering Rural Communities* (Gauteng: Development of Southern Africa, 1995), 125–38; P. Starkey, 'The History of Working Animals in Africa', in K. MacDonald and R. Blench (eds.), *The Origins and Development of African Livestock: Archaeology, Genetics, Linguistics and Ethnography* (London: University College London Press, 2000), 483–85; M. Alexander, 'Military Use of Animals in South Africa (1400-1881)', *Scientia Militaria, South African Journal of Military Studies* 7, 4 (1977), 47, 51, 52.
[11] Burman, *Towards the Far Horizon*, 67–87.
[12] *Ibid*.
[13] Joubert, 'An Historical Perspective on Animal Power Use in South Africa', 134.
[14] D. Morris, *The Washing of the Spears* (London: Jonathan Cape, 1966), 312, 314–15.

Since wagon routes prefigured the region's roads, histories of the development of roads in South Africa offer some interesting links to wagon transport.[15] The road engineer Graham Ross's 5th edition *Mountain Passes, Roads and Transportation in the Cape – a Guide to Research* (2013) contains over 700 pages of temporally collated references and quotations related to Cape and South African passes and roads, and in terms of its scope and meticulousness is unexampled.[16] Since most if not all roads in South and southern Africa were first animal paths, then local Africans' footpaths, and then wagon paths, and then roads, the research guide contains manifold references to wagon routes and wagons.

Jan-Bart Gewald's study of the impact of motor vehicles in Namibia indicated various disadvantages of wagon transport, including its reliance on cattle accessing pasture and water, the slow pace of wagons, that they were labour intensive, requiring 'highly skilled and structured occupations', and an entourage needing all attendant planning and provisions, which, as he put it, 'formed small social islands that slowly traversed the veldt'.[17] But it was rinderpest, spread rapidly across the region by cattle along vast wagon routes, as he and others showed, which really emphasised the practical limits of oxen-pulled wagons as a suitable means of transport and trade.[18] Gordon Pirie emphasised the state-funded expansion of steam train systems as ending the era of wagon and wagon transport riding.[19]

The most comprehensive history of ox wagon transport in South Africa is Jose Burman's *Towards the Far Horizon: The Story of the Ox-wagon in South Africa* (1988).[20] The well-researched book gives an evidence-based and periodised account of wagon transport from 1653 until the early twentieth century. Published accounts of travellers, scientific explorers, and some missionaries form the predominant sources of evidence, which he read minutely. The numerous accounts drawn on by Jose Burman contain first-hand observations of wagon

[15] Mitchell, 'Setting the Scene: A Brief History of Transport Infrastructure in South Africa', 36.
[16] G. Ross, *Mountain Passes, Roads, and Transportation in the Cape – a Guide to Research*, *5th Edition* (Graham Ross, 2013).
[17] J-B. Gewald, 'Missionaries, Hereroes, and Motorcars: Mobility and the Impact of Motor Vehicles in Namibia before 1940', *The International Journal of African Historical Studies* 35, 2/3 (2002), 276, 279–80.
[18] *Ibid*, 258. And see Chapter Three, this thesis, for more details.
[19] G. Pirie, 'Slaughter by Steam: Railway Subjugation of Ox-Wagon Transport in the Eastern Cape and Transkei, 1886-1910', *The International Journal of African Historical Studies* 26, 2 (1993), 319–43.
[20] Burman, *Towards the Far Horizon*, 7–97, 106–163.

transport and oxen labourers because these travellers themselves rode in oxen-pulled wagons.

Apart from these studies of wagon transport, travellers' writings are a key source of information about oxen labour. The writings of travellers have been explored in many ways. Before Siegfried Huigen's readings of travellers' accounts of southern Africa, influential readings of such texts broadly followed two approaches.[21] The first was by colonial historians interested in reconstructing the explorers' routes, since these enabled colonial settlement and expansion and was exemplified by Vernon Forbes's *Pioneer Travellers of South Africa; a Geographical Commentary upon Routes, Records, Observations and Opinions of Travellers at the Cape, 1750-1800* (1965).[22] He was consumed by an attempt to hyper-accurately reconstruct the routes scientific travellers took. He regarded these travellers as triumphantly forging the routes that enabled the entry of European civilisation and colonialism into southern Africa.

The other approach was most prominently promoted by Mary Pratt's *Imperial Eyes: Travel Writing and Transculturation* (1992), which critiqued the travellers' writings as instrumentally colonial and crucial to opening southern Africa up to western domination. For her, scientific travellers were like colonial spies in the service of colonial projects.[23] Mary Pratt's readings of a few scientific explorers are fragmentary, and as Siegfried Huigen put it, she saw travel texts as 'attempts to intellectually annex non-European territory and to pave the way for colonial expansion.'[24] In her interpretations, the travel texts are colonial views, and we see through imperial eyes when we read scientific travellers' accounts.

In his book *Knowledge and Colonialism* (2009), the recent major attempt to synthesise travel writings from around the eighteenth century, Siegfried Huigen – based on relatively close and contextualised readings of mostly Peter Kolb, François Le Vaillant and John Barrow – argued that knowledge could be gleaned from the travel writers, that their texts were not simply

[21] See S. Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa* (Leiden: Brill, 2009), 26–30.
[22] V. Forbes, *Pioneer Travellers of South Africa; a Geographical Commentary upon Routes, Records, Observations and Opinions of Travellers at the Cape, 1750-1800* (Cape Town: A. A Balkema, 1965).
[23] Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa*, 239.
[24] *Ibid*, 28.

representations of colonial interests, and that the texts should be read as a symbiotic interplay between predecessors' texts, extant science and the colonial context, from which important scientific knowledge emerged, admittedly sometimes useful to colonial regimes.[25] He was critical of Mary Pratt's taking a fragmentary approach to travel writings, making large inferences about science based on small pieces of uncontextualized text, and claimed that scientific travellers had 'too much of an individual profile to allow them to be subordinated to an amorphous and supra-individual discourse in the analysis'.[26]

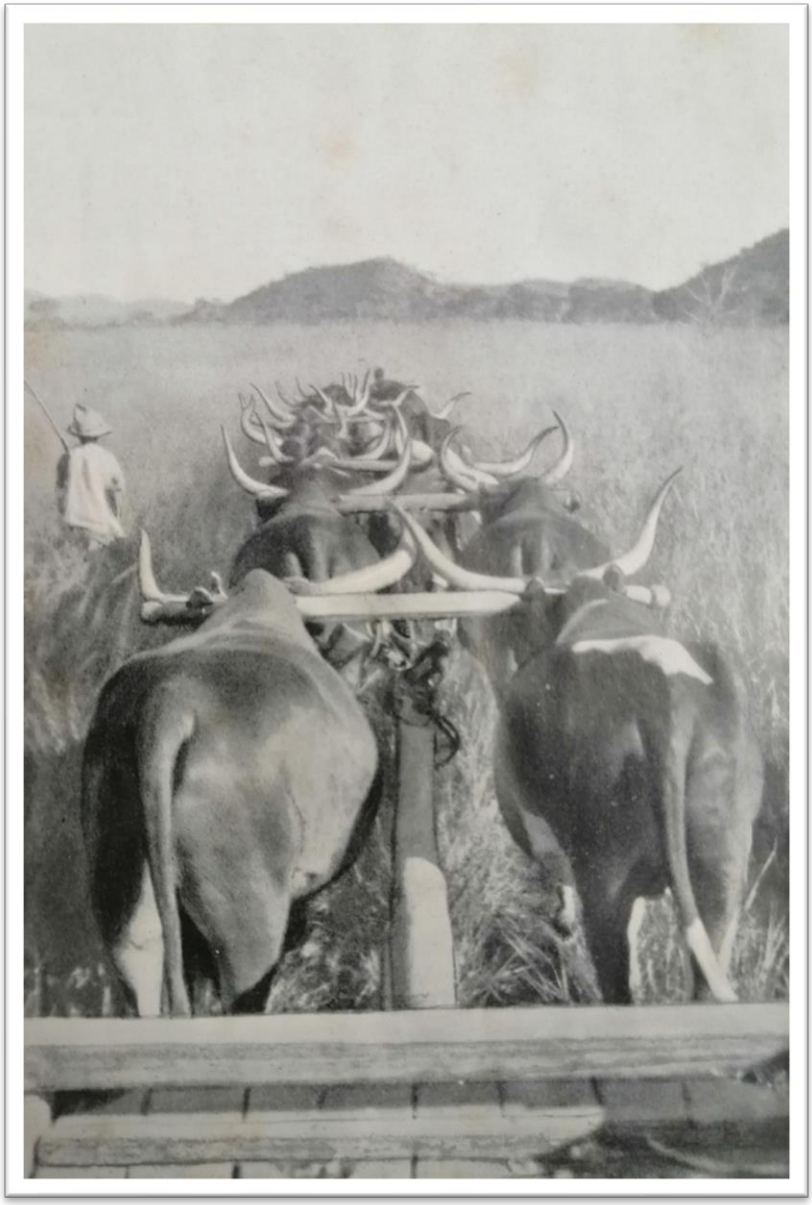
Travellers' accounts of southern Africa have been read in many ways. L.C Rookmaker impressively endeavoured to list the animal species described in southern Africa in her *The Zoological Exploration of Southern Africa 1650-1790* (1989).[27] Other authors have explored travel writings for representations of the Khoisan and Khoikhoi, or examined themes of science, masculinity, embodiment, and knowledge.[28] Yet others have focused more narrowly on specific travel writers and their contexts and influence.[29] While Siegfried Huigen was critical of analysing small pieces of text and drawing general conclusions about the travellers, he did note commonalities, such as their shared empiricist epistemology.[30]

Other reasonable general claims can be made about the scientific and other travellers. All of them were dependent on hunting and/or eating animals. They were all involved directly or indirectly in forcing animals to work for them, and harming them by killing them for food. Examples include their European animal consumption habits, using animals to plough land, in the case of missionaries, and compelling oxen to pull wagons. They all saw oxen whipped, all

[25] *Ibid*,39–40.
[26] *Ibid*, 30.
[27] L. Rookmaaker, *The Zoological Exploration of Southern Africa 1650-1790* (Rotterdam: A. A Balkema, 1989).
[28] R. Ross, 'Khoesan and Immigrants: The Emergence of Colonial Society in the Cape, 1500 – 1800', in C. Hamilton, B. Mbenga, and R. Ross (eds.), *The Cambridge History of South Africa, Vol. I* (Cambridge: Cambridge University Press, 2010), 168–210; W. Beinart, 'Men, Science, Travel and Nature in the Eighteenth and Nineteenth-century Cape', *Journal of Southern African Studies* 24, 4 (1998), 775–99; Rookmaaker, *The Zoological Exploration of Southern Africa 1650-1790*.
[29] A. Martin, 'Performing Scientific Knowledge Transfer: Anne Plumptre and the Translation of Martin Heinrich Lichtenstein's Reisen Im Südlichen Afrika (1811)', *Journal of Literature and Science* 8, 1 (2015), 9–26; D. Driver, 'Lady Anne Barnard's Cape Journals and the Concept of Self-Othering', *Pretexts* 5, 1–2 (1995), 46–65; N. Ulrich, 'Dr Anders Sparrman: Travelling with the Labouring Poor in the Late Eighteenth-Century Cape', *South African Historical Journal* 61, 4 (2009), 731–49; N. Penn and A. Delmas, 'Peter Kolb and the Circulation of Knowledge about the Cape of Good Hope', in M. Lengwiler, N. Penn, and P. Harries (eds.), *Science, Africa and Europe: Processing Information and Creating Knowledge* (New York: Routledge, 2019), 15–46, for example.
[30] Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa*, 30.

the oxen they used needed food, rest, and water. The travellers also all depended on oxen not dying or becoming too weak, or running away, or on the availability of more oxen to replace their lost kin. Further, perpetual, loud whip-cracking and shouting was an inherent part of the experience of travelling by wagon. These sensory experiences intensified when moving through difficult terrains such as mountains, rivers, or scorching Karoo desert sands. A view that travellers would have seen from the front of wagons follows.

Image 2.1. View from the front of a wagon



Source: W. Robertson, *Rhodesian Rancher* (London: Blackie & Son Limited, 1935), frontispiece.

There are hundreds of first-hand observations and scores of drawings and paintings of cattle's oxen labour. What distinguishes this chapter from previous scholarship on wagons, travellers accounts, and animal histories in general, is that cattle do not feature incidentally but are instead foregrounded as sentient beings whose experiences and forced labour contributions are recognised and explored in their own right. The aim is not to make general claims about the travellers themselves but to mine their texts for representations of cattle labour to produce vignettes of cattle's experiences as wagon labourers. This approach, to use travellers' accounts to understand subjective impacts of colonialism on cattle, is without precedent in the southern African literature.

There is a large volume of writing produced by travellers, officials, and missionaries over this period. Those which have good descriptions of oxen's wagon labour, in terms of describing and understanding oxen's experiences, are drawn on in this chapter. Rowland Raven-Hart's *Before Van Riebeeck: Callers at South Africa 1488 to 1652* (1967), arranged fragments of writings from those who stopped at the Cape before 1652.[31] Jan Van Riebeeck's first of three volumes of journals contains the first recorded instances of cattle and horses as wagon labourers in South Africa.[32] European expeditions into the interior became possible post-1652 because the Cape could be used as a base from which to launch expeditions. Buried deep in François Valentijn's enormous multi-volume *Oud en Nieuw Oost-Indië*n (1724–1726), there are accounts of VOC-related journeys into the interior, including that of Simon Van der Stel's journey to Namaqualand (1685–1686) and Henrick's Hops' into what became southern Namibia (1761–1762).[33] These expeditions were linked to VOC interests and business. In 1719 Peter Kolb published *Caput Bonae Spei Hodiernum* ('The Current State of the Cape of Good Hope'), which was a foundational scholarly text on South Africa, and indeed the first-ever published text to deal exclusively with the Cape.[34] Until late in the eighteenth century, writes

[31] R. Raven-Hart, *Before Van Riebeeck: Callers at South Africa 1488 to 1652* (Cape Town: C. Struik, 1967), 7, 10, 20.
[32] J. van Riebeeck, translated by H. Thom, *Journal of Jan Van Riebeeck Volume 1, 1651-1655* (Cape Town: A. A Balkema, 1952); J. van Riebeeck, H. Thom (ed.), *Journal of Jan Van Riebeeck. Vol. 2., 1656-1658* (Cape Town: A. A Balkema, 1954); J. van Riebeeck, H. Thom (ed.), *Journal of Jan Van Riebeeck: 1659-62, Vol. 3* (Cape Town: A. A Balkema, 1958).
[33] See Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa*, 4, 75, 76.
[34] Penn and Delmas, 'Peter Kolb and the Circulation of Knowledge about the Cape of Good Hope', 15; P. Kolben, translated by. Mr Medley, *Present State of the Cape of Good-Hope* (London: W. Innys, 1731 [1719]).

Siegfried Huigen, it remained 'the most authoritative book on Southern Africa', comprising 900 folios on the colonial settlement, local populations, geography and environment of the Cape.[35]

The account which contains among the most sensitive descriptions of cattle labourers is Otto Mentzel's *Vollständige und Zuverlässige Geographische und Topographische Beschreibung des Berühmten und in Aller Betrachtung So Merckwürdigen Afrikanischen* (1787), based on his time at the Cape between 1733 and 1741, which was translated into English as *A Geographical and Topographical Description of the Cape of Good Hope* in 1944.[36] Then there is Carl Linnaeus's student, Anders Sparrman's *A Voyage to the Cape of Good Hope* (1785), and the French-Surinamese ornithologist François le Vaillant's *Travels into the Interior Parts of Africa by way of the Cape of Good Hope* (1780 -1784), translated from French into English in 1796.[37] Anne Barnard's letters and journal entries from her time in South Africa between 1797 and 1802 also contain many descriptions of oxen's wagon labour, as does the British missionary Robert Percival's *An Account of the Cape of Good Hope* (1804), based on his time at the Cape between 1795 and 1801.[38] The early nineteenth century produced texts such as John Barrow's *Travels into the Interior of Southern Africa* (1806), and Hinrich Lichtenstein's *Travels in Southern Africa* (1812) which covers the years 1804 to 1806.[39] William Burchell's travels and experiences with cattle wagon labourers in 1815, including many drawings of wagons and wagon transport, were published in 1822 in his *Travels in the Interior of Southern Africa*.[40] Descriptions of oxen labour from 1816 by the missionary Robert Moffat were published in

[35] Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa*, 5.
[36] O. Mentzel, *Vollständige Und Zuverlässige Geographische Und Topographische Beschreibung Des Berühmten Und in Aller Betrachtung So Merckwürdigen Afrikanischen* (Glogau: G. F Gunther, 1787); O. Mentzel, translated by G. Marais and J. Hoge, *A Geographical and Topographical Description of the Cape of Good Hope* (Cape Town: The Van Riebeeck Society, 1944 [1787]), 24, 32, 70, 73, 82, 105–6, 112, 124, 126, 131, 145, 146, 150, 200–202, 245.
[37] A. Sparrman, *A Voyage to the Cape of Good Hope*, *Vol. I* (London: G. G. J and J. Robinson, 1785), 53–54, 121, 123–24, 127, 133, 171, 244, 294; F. Le Vaillant, *Travels into the Interior Parts of Africa* (London: G. G. and J. Robinson, 1796), 24, 43, 65, 139, 144, 156, 160, 170, 172–73, 205, 209, 213, 228–29, 231–32, 264, 276–78, 281–282.
[38] Barnard, *South Africa a Century Ago (1797 - 1801)*, 160, 162, 164, 1669, 170, 173, 217; R. Percival, *An Account of the Cape of Good Hope* (London: C. and R. Baldwin, 1804), 54–59, 61, 221.
[39] J. Barrow, *Travels into the Interior of Southern Africa* (London: T. Cadwell and W. Davies, 1806), 70, 74, 96, 120, 323; H. Lichtenstein, translated by A. Plumptre, *Travels in Southern Africa, in the Years 1803, 1804, 1805, and 1806* (London: Henry Colburn, 1812), 13–15, 22, 31, 33, 43, 53, 64–66, 77, 107, 126, 191–92, 207, 237, 343, 366.
[40] W. Burchell, *Travels in the Interior of Southern Africa*, *Vol. I* (London: Longman, Hurst, Rees, Orme, and Brown, 1822), 28, 52, 65, 217, 222–23, 225, 227, 231, 239, 253–54, 267, 300.

Missionary Labours and Scenes in Southern Africa.[41] The British Lieutenant colonel Edward Elers Napier wrote incidentally on cattle's wagon labour during his stint in South Africa in the 1840s in his *Excursions in Southern Africa* (1850).[42] And while his work was edited against his will and 'softened' to be more amenable to potential British immigrants, it still contained vivid descriptions of wagon transport and oxen.[43] Finally, David Livingstone's *Missionary Travels and Researches in South Africa* (1857) and Thomas Baine's *Explorations in South-West Africa* (1864), include accounts of our topic from the 1840s to the 1860s.[44] The texts invoked in this chapter were selected to cover the period when wagon labour was a major feature of colonial expansion, and also because they have detailed descriptions of oxen's wagon labour.

These writers represented cattle as wagon-pullers based on phenomena they all had sustained first-hand experiences of. Many of them travelled by wagon on journeys that lasted weeks or months. So, the many corroborating accounts of oxen's wagon labour over the eighteenth and nineteenth centuries do count as useful representations. Such descriptions or representations are not, as Jonathan Saha reminded us, 'transparent windows' into the lives of animals.[45] But read together, alive to silences, word choices, and the authors' contexts and prejudices, their accounts remain some of the best evidence of oxen's wagon labours for the region and time.

The broad aim of this thesis is to explore some of colonialism's major impacts on cattle's experiences. The colonial impact isolated in this chapter is cattle's transformation into and work as wagon labourers. Cattle performed other forms of labour, as plough pullers, as pack-carrying transporters, as metabolic and reproductive labourers, as milk producers – but wagon labour is isolated for reasons of focus. The approach of this chapter is to read travellers, missionaries, and officials' accounts of southern Africa by mining them for

[41] R. Moffat, *Missionary Labours and Scenes in Southern Africa* (London: John Snow, 1846), 19, 24, 26–27, 65, 73, 76, 80, 82, 94, 99, 101, – 104, 107, 117–19, 124, 134–35.
[42] E. Napier, *Excursions in Southern Africa*, *Vol. II* (London: William Shoberl, 1850), 1–3, 12–13, 15, 17–18, 38, 111, 176, 330.
[43] M. Baker, 'Military Writers and Their Readers: The Transnational Circulation of Campaign Narratives of the Eastern Cape Frontier Wars between 1834 and 1853', *English in Africa* 44, 2 (2017), 20–22.
[44] Livingstone, *Missionary Travels and Researches in South Africa*, 10, 11, 54–55, 57, 60–61, 70, 75, 79, 81–82, 94, 104, 125, 138, 153, 168, 177, 322; Baines, *Explorations in South-West Africa*, 6, 25–26, 28–29, 37, 58, 62–63, 81, 85, 91, 125, 140, 144–45, 227, 236–37, 389, 403, 450.
[45] J. Saha, 'Colonizing Elephants: Animal Agency, Undead Capital and Imperial Science in British Burma', *BJHS Themes* 2 (2017), 172.

descriptions of cattle as wagon labourers. These texts are read in conjunction with the biological and social information about cattle presented in the preceding chapter. In terms of cattle's experiences as colonial wagon labourers, this is done to create vignettes of cattle subjectivity. These vignettes – informed by a combination of descriptive representations from different first-hand observers – together form a mosaic-like representation of cattle experiences in southern Africa between the mid-seventeenth and mid-nineteenth centuries. These accounts were read for all references to wagons, yokes, oxen, whips, transport, and cattle. Such a reading of texts produced hundreds of descriptions of oxen's wagon labours. Since they relate directly to cattle's experiences, themes explored in this chapter include oxen as labourers, processes of inspanning, oxen control by whipping, fatigue, hunger and thirst, travels into the interior of southern Africa, agency expressed as resistance and escape attempts, and oxen as road-makers.

Oxen's wagon labour: vignettes of subjectivity, 1653–1800

Cattle were not first compelled to perform labour when the VOC arrived in 1652. As I discussed in Chapter Two, from the tenth to the sixteenth century Proto-Nguni speakers were innovating a range of terms as part of a larger cattle breeding, reproduction, and accumulation lexicon. New terms started to distinguish cattle by age, sex and reproductive capacities, suggesting that cattle had begun to perform reproductive labour. Cattle were also performing metabolic labour – they were eating so that they could grow, reproduce, produce milk, and be accumulated by southern African human groups. These forms of labour became increasingly entrenched and widespread over the next several centuries, so that by the time Adam Kuper drew on mid-nineteenth century texts to write *Wives for Cattle* (1982), he could claim that cattle were central to cattle-keeping societies across southern Africa.[46] But cattle did not only perform metabolic and reproductive labour.

There were many cattle in the Cape by the late fifteenth century. When Bartolomeu Dias landed at Mossel Bay in 1488 he called it *Angra dos Vaqueiros,* Bay of cattle herders.[47]

[46] A. Kuper, *Wives for Cattle: Bridewealth and Marriage in Southern Africa* (London: Routledge & Kegan Paul Books, 1982), 11.
[47] P. Raper, *Dictionary of Southern African Place Names* (Johannesburg: Lowry, 1987), 68.

Travellers who had stopped at the Cape in the fifteenth and sixteenth centuries claimed to have observed cattle performing other forms of labour. Vasco da Gama described the cattle he saw in the late fifteenth century as 'very large… and very marvellously fat, and *very tame*'.[48] He noted that the bulls were 'gelded', castrated, and that the larger ones were fitted with saddles loaded with cargo. There is evidence, including texts and rock paintings, that cattle were ridden and loaded with cargo in north Africa at least two millennia ago.[49] Oxen were forced to pull ploughs from about three to five thousand years ago in north Africa.[50] Oxen also pulled funeral sledges in Egypt over three thousand years ago.[51] A later depiction of the Khoikhoi method of castrating bulls is reproduced below.

Image 2.2. 'The Hottentots method of gelding their bulls and rams'

Source: P. Kolben, translated by Mr Medley, *Present State of the Cape of Good-Hope* (London: W. Innys, 1731 [1719]), 170.

Also, sticks were thrust through the noses of cattle and they were led and ridden by this method.[52] Cattle also performed military labour. Francisco d'Almeida noted that cattle in 1510

[48] Raven-Hart, *Before Van Riebeeck: Callers at South Africa 1488 to 1652*, 7, emphasis added.
[49] K. Lindblom, *The Use of Oxen as Pack and Riding Animals in Africa* (Stockholm: Riksmuseets Etnografiska Avdelning, 1931), 7–9.
[50] Starkey, 'The History of Working Animals in Africa', 478–79.
[51] *Ibid*.
[52] Raven-Hart, *Before Van Riebeeck: Callers at South Africa 1488 to 1652*, 7.

were trained to respond to whistling and 'other signs', and that they could surround an enemy and form 'a defensive wall', 'since they [cattle] are trained to this warlike device', from behind which the cattle's human masters could attack their enemies with volleys of hard, sharp sticks.[53] But this defensive operation was likely not simply ingenuity on the part of the Khoikhoi. Albeit later, the *Journal* records that:

> Something remarkable was observed among our cattle in the kraal…. As soon as they become aware of the leopard in the fowl-house they all collected in a body with their horns towards the door and formed a crescent, so that the leopard had all he could do to keep clear of their horns and escape – even though, by their bellowing, these animals gave ample evidence of their terror of the wild beast. Indeed, we have *often* noticed that leopards, lions and tigers are unable to harm cattle when they form themselves into a protective circle, so that not a single one of the calves inside it is carried off by the wild beasts – a wonderful sight to see.[54]

The Khoikhoi likely copied these defensive strategies by training and giving signals to the cattle to protect them as their own calves, and from this position launch attacks. In other pre-VOC cases, cattle's horns were sharpened and they could be commanded to rush at enemies.[55] There are frequent mentions of cattle obedience to human calls and whistles, long before the VOC set up its fort.[56] So cattle in southern Africa were trained to be responsive to whistles and calls, they were saddled with cargo, and controlled for riding via sticks through their noses, and they could perform military operations for themselves and their masters. Male cattle's testes were amputated, gelded, likely to control their reproduction, reduce defensive aggression, and increase their pliability. There is no known pre-VOC record of cattle pulling sledges or carts, however.[57] There were no wheels, and there was no writing.

With the arrival of the VOC, a new form of cattle labour emerged: cart and wagon pulling to transport humans and cargo. Jan van Riebeeck learned from local humans that cattle could be obediently responsive to commands and perform transport labour. Oxen are castrated adult male cattle. Just over a year after arriving, he was coercing oxen to carry wood from the

[53] *Ibid*, 10.
[54] van Riebeeck, *Journal of Jan Van Riebeeck Volume 1, 1651-1655*, 315, emphasis added.
[55] Joubert, 'An Historical Perspective on Animal Power Use in South Africa', 125.
[56] Raven-Hart, *Before Van Riebeeck: Callers at South Africa 1488 to 1652*, 23, 82, 121, 123, 180.
[57] Joubert, 'An Historical Perspective on Animal Power Use in South Africa', 125.

Kirstenbosch forests on a carpenter's cart that had been expressly developed. On the 26th of May 1653, VOC men were 'making gear for the cart to be drawn by oxen'.[58] Two days later oxen were harnessed into the cart/wagon, which they 'pulled reasonably well'.[59] Two weeks later there were eight oxen employed as wagon-pullers – two per cart, while the other six were trained or rested.[60] The wagon was loaded with beams of wood and the cattle pulled it along what became Main road and Newlands avenue in Cape Town towards the inchoate VOC base near the port. It was the first European-built road, superimposed onto older animal pathways, and was called *Die Ou Wagen Pad Na 'T Bos*, the old wagon path to the forest. Thus, a dramatic shift in southern African cattle's history began – but not quietly.[61]

From the first, oxen resisted this new form of coerced labour. Because they butted their horns at their new masters, the *Journal* described the oxen as 'dangerous to handle', on account of their being 'unaccustomed to hauling or other similar tasks'.[62] Jan van Riebeeck thus started to prefer horses over oxen, after the VOC had imported the former.[63] Sometimes cattle resistance reached a supreme intensity. Describing what may be the first recorded cattle self-annihilation associated with wagon labour in southern Africa, on 15 June 1655 the *Journal* notes that:

> Last night one of the oxen which [sic] had been yoked to draw the wagon, behaved in so strange and wild a manner that it broke its [sic] own neck, proving again that oxen will not be a success, so that we shall have to be provided with a few more horses to haul our timber and firewood from the forest.[64]

Reasonably interpreted, that nameless oxen preferred to break his own neck rather than be yoked to and pull a VOC wagon. Accepting that cattle have minds and experiences, based on information presented about cattle biology and minds in the preceding chapter, this ox surely recognised that his neck-jerking was becoming gravely injurious and potentially deadly. Considering that agency in this thesis refers to a sentient, perceiving being's conative striving

[58] van Riebeeck, *Journal of Jan Van Riebeeck Volume 1, 1651-1655*, 157.
[59] *Ibid*.
[60] *Ibid*, 160.
[61] Ross, *Mountain Passes, Roads, and Transportation in the Cape*, 68.
[62] van Riebeeck, *Journal of Jan Van Riebeeck Volume 1, 1651-1655*, 317.
[63] S. Swart, *Riding High: Horses, Humans and History in South Africa* (Johannesburg: Wits University Press, 2010), 18, 21.
[64] van Riebeeck, *Journal of Jan Van Riebeeck Volume 1, 1651-1655*, 331.

towards their species-characteristic good, the ox's persistence permits the inference that he preferred potential self-annihilation to VOC wagon labour.[65] By rejecting the yoke, the oxen pursued his good, namely not being yoked and coerced into wagon labour, even if this meant his own annihilation. His own annihilation was a good preferable to the only other option. Where humans are concerned, there are powerful reasons to believe that under certain conditions suicide is rational.[66] This includes 'fates that are both worse than and only avoidable by death'.[67] The same may be true for sentient animals. If, less boldly, this was not a suicide, it was akin to the frequent cases of purposively trapped animals, especially mothers in desperation to return to their young, who gnaw their own limbs off to escape traps set by animal fur traffickers – a reaction called 'wringing off' by trappers.[68] The oxen's agency made a strong enough impression to convince Jan van Riebeeck, temporarily, that oxen were unsuited for such labour.[69] In the same year, however, the Cape had its first wagon-builder or wainwright.[70] Wagons of this time would become the prototype of the *kakebeen* wagon, and oxen pulling such wagons would come to comprise the main form of colonial transport in the region for over the next 200 years.

In 1657 the VOC gave farmers land along the Liesbeek River, and provided them with harrows, ploughs, and twelve plough-trained oxen.[71] Thus the free burghers, full-time farmers, were born, and the Cape shifted from a mere refreshment station to becoming a settlement.[72] Farmers after this started to adopt semi-nomadic lifestyles, using their wagons as their homes, indicating how important wagons and oxen labourers were becoming to their lives. They eventually became the trekboers. Cattle were extremely prized by the VOC, and on one account the first war between local human groups and the VOC broke out in 1659 because of cattle theft.[73] In 1662 a wagon was first used to carry supplies on an expedition towards the

[65] See my extensive discussion of animal agency in Chapter One.
[66] D. Benatar, *The Human Predicament: A Candid Guide to Life's Biggest Questions* (New York: Oxford University Press, 2017), 163–99.
[67] Benatar, *The Human Predicament*, 163.
[68] PETA, 'The Jaws of Death: How Steel-Jaw Traps Torture and Kill Animals (blog)', *PETA.Org*, 9 September 2020, https://www.peta.org/features/steel-jaw-trap-fur-cruelty/, accessed 5 June 2020.
[69] van Riebeeck, *Journal of Jan Van Riebeeck Volume 1, 1651-1655*, 342.
[70] Burman, *Towards the Far Horizon*, 147.
[71] Joubert, 'An Historical Perspective on Animal Power Use in South Africa', 126.
[72] S. Swart, 'Settler Stock? Animals and Power in Mid-Seventeenth Century Contact at the Cape, circa 1652-62', in P. Cuneo (ed.), *Animals and Early Modern Identity* (London: Routledge, 2016), 253.
[73] Silver and Co, *S. W Silver & Co's Handbook to South Africa*, 9.

little Berg River, where there were no paths except those forged by eland and the Khoikhoi.[74] Twenty days later, having broken down repeatedly, the wagon was buried. The supplies were loaded onto the oxen's backs, but they 'bucked furiously', and damaged the cargo.[75] Four days later, and after much heavy treatment, some of them complied but others remained intractable.[76] Despite such setbacks, from the VOC perspective, wagons were becoming engendered and more developed. In 1663 the VOC fixed the price of woods used for wagon-making.[77] The first non-VOC employed wagon-maker and blacksmith was established by 1666.[78] Annually, by 1671 oxen pulled over 500 wagon loads of their own manure from the Groote Schuur kraal to fertilise gardens in Table Valley and Rustenberg.[79] Just over ten years later, a wagon was designed to be disassembled to transit over the forbidding passes in the Cape. This technological development would start to transform wagons into highly robust and versatile tools, meaning that cattle would have to pull them over passes like Hottentots Holland, Houw Hoek, and myriad daunting others. VOC explorations could thus advance further, which for oxen meant that journeys became longer, more arduous, and their loads heavier. After this, Cape wagons were designed to be dismantled swiftly and carried.[80] Oxen were thus required to freight cargos on their backs, also.

[74] Burman, *Towards the Far Horizon*, 21; Ross, *Mountain Passes, Roads, and Transportation in the Cape*, 73; Raper, *Dictionary of Southern African Place Names*, 76.
[75] Burman, *Towards the Far Horizon*, 21.
[76] *Ibid*.
[77] G. Theal, *Abstract of the Debates and Resolutions of the Council of Policy at the Cape from 1651 to 1687* (Cape Town: Saul Solomon and Co, 1881), 87.
[78] Burman, *Towards the Far Horizon*, 19.
[79] J. Bottaro, 'The Changing Landscape of the Liesbeek River Valley' (Master's Thesis, University of Cape Town, Cape Town, 1996), 29.
[80] Burman, *Towards the Far Horizon*, 23.

Image 2.3. William Burchell's depiction of a wagon being dismantled to change a wheel

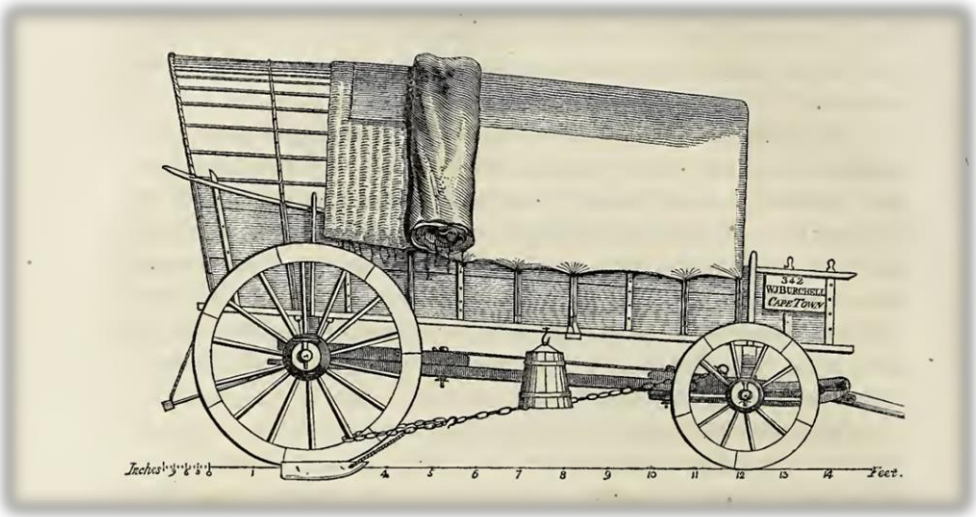
Source: W. Burchell, *Travels in the Interior of Southern Africa, Vol. I* (London: Longman, Hurst, Rees, Orme, and Brown, 1822) 534.

The free burghers, pulled on their wagons by oxen, were moving and settling in areas like Stellenbosch (1679), Drakenstein (1687), and Franshoek (1688).[81] Between 1691 and 1700 about one in ten settler farmers owned wagons, whereas a century later between 1791 and 1800 settler farmers on average owned one wagon each.[82] The numbers of cattle and sheep under the control of settlers started to increase quite rapidly at the turn of the eighteenth century. Between 1652 and 1699, VOC records indicate that 15 999 cattle and 36 636 sheep were purchased by the VOC from the Khoikhoi, although the actual numbers are thought to be higher.[83] In the eight years after the opening of trade between free burghers and the Khoikhoi, 1700-1708, colonial ownership of cattle and sheep 'jumped dramatically' by 8 871 and 35 562 respectively, although theft and raiding enabled part of these transfers.[84] Thus in the eighteenth century settlers were increasingly involved in trafficking cattle and sheep. Around 1710 settlers controlled 20 082 cattle and 131 000 sheep.[85] This meant that large grazing areas were required, and trekking with wagons increased. To stimulate cattle and

[81] *Ibid*, 29.
[82] J. Fourie, 'An Inquiry into the Nature, Causes and Distribution of Wealth in the Cape Colony, 1652-1795' (PhD Dissertation, Utrecht University, Utrecht, 2012), 48.
[83] R. Elphick and V. Malherbe, 'The Khoisan to 1828', in R. Elphick and H. Giliomee (eds.), *The Shaping of South African Society, 1652–1840* (Connecticut: Wesleyan University Press, 1979), 19.
[84] *Ibid*, 21.
[85] Burman, *Towards the Far Horizon*, 35.

sheep breeding and crop production, by 1720 the VOC granted free burghers farms at low rent, farms that could be exchanged for other farms when grazing capabilities diminished.[86] Trekboers continued to move further into the Cape, and as they did their wagon technology developed further. The kakebeen wagon was coming into existence. It was named kakebeen because it resembled a cattle's jaw. A depiction of a later iteration of the kakebeen wagon follows.

Image 2.4. William Burchell's wagon in 1815



Source: Burchell, *Travels in the Interior of Southern Africa, Vol. I*, 147.

Kakebeen wagons comprised two parts, the carriage and the wagon on which the carriage rested. The wagon had two pairs of wheels. The axels were made from wood but could nonetheless handle a weight of 800 kilograms.[87] An early iteration of a kakebeen wagon pulled by oxen at the Grand Parade in Cape Town in the eighteenth century is depicted in Jose Burman's *Towards the Far Horizon* (see below).

[86] Joubert, 'An Historical Perspective on Animal Power Use in South Africa', 126.
[87] Burman, *Towards the Far Horizon*, 47–57.

Image 2.5. Oxen wagon labourers at work at the Grand Parade, eighteenth century

Source: Burman, *Towards the Far Horizon*, 20.

During the 1730s, in the context of increasing cattle populations, trekboers moving further into what became South Africa, and increased wagon labour, the German Otto Mentzel lived in the Cape and was much moved by the oxen's labour he observed. His book *A Geographical and Topographical Description of the Cape of Good Hope* contains remarkably cattle-sensitive descriptions of among others inspanning, breaking oxen in to wagon labour, and oxen agency. Although he published it in 1785, forty-four years after he left the Cape, he is an important source for a history of oxen's wagon labour because he was well-educated for the time (he worked as a teacher for a wealthy farmer's children), lived in the Cape for a decade, had plentiful opportunity to observe wagon labour, and he was uniquely impressed by the oxen he observed. Further, many of his claims about oxen's wagon labour are corroborated by later observers.[88]

[88] Lichtenstein, *Travels in Southern Africa, in the Years 1803, 1804, 1805, and 1806*, 13–15, 31; Barrow, *Travels into the Interior of Southern Africa*, 155, 375; Burchell, *Travels in the Interior of Southern Africa*, *Vol. I*, 242; Sparrman, *A Voyage to the Cape of Good Hope*, *Vol. I*, 39–41, 50, 53–54, 123, 127, 244, 294; Le Vaillant, *Travels into the Interior Parts of Africa*, 43, 144, 228; Napier, *Excursions in Southern Africa*, *Vol. II*,17, 38; Livingstone, *Missionary Travels and Researches in South Africa*, 322; Baines, *Explorations in South-West Africa*, 37, 62–63, 342, 403.

Owing to their skill at commanding and communicating with cattle, and the deep knowledge of the climate, terrain and landscape, settlers often used Khoikhoi men as drivers of their wagons. These drivers sat at the front of the wagons or walked alongside them and wielded lengthy whips. They, the settler farmers and trekboers also knew all of the oxen by name and shouted or spoke to them individually during their toils.[89] As Otto Mentzel put it, 'the reader should know that the farmers of Africa give special names to all their trek-oxen, horses and cows'.[90] Oxen labourers were recognised as individuals, with discrete personalities, temperaments and strengths. Otto Mentzel left vivid descriptions of the process of 'breaking' oxen in to wagon labour spans. A span is a team of wagon labourers and inspanning refers to connecting the oxen to their yokes, which are linked to the wagons. To outspan is to unyoke the cattle for grazing and rest. Outspan as a noun is a place where oxen are outspanned, often near water and pasturage. A span comprised between six and ten or more oxen, depending on the terrain, load, and similar considerations. Otto Mentzel described breaking oxen in to wagon labour:

> When an ox is three years old it is inspanned and taught to pull. The poor animal learns in a hard school. Firstly, a young ox that has never been tied up before is caught in the following manner. A slave approaches the animal stealthily from behind and throws over its horns, and if possible also over its head and around its neck, a looped cord which is tied to a long stick. Then… another slave catches the opposite end and the ox is led to where it is to be inspanned next to an old mate under a yoke. Usually this is done when manure is being carted to the fields, so that the apprentice may tire more quickly on account of the heavy load and may be managed more easily. Since the young animal is entirely ignorant of the yoke and not trained to walk and pull in a straight line with its team, it is continually whipped with the eight to ten yard long lash. Truly, it is piteous to see how the long lash at each blow removes hair, causes weals to rise and blood to flow; but in this way the animal becomes so exhausted and worn-out that after three or four days it patiently lets itself be caught and inspanned, although shivering and shaking. Then the rigid training is over. The newly broken in oxen are harnessed in pairs to the middle of the wagon and the plough, the oldest and strongest to the shaft, and those that respond best to their names, right in front. Every ox is given a name, and one hears the continual shout of the driver e.g.

[89] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 23–24; Le Vaillant, *Travels into the Interior Parts of Africa*, 65; Baines, *Explorations in South-West Africa*, 236–37; Barnard, *South Africa a Century Ago (1797 - 1801)*, 173; Lichtenstein, *Travels in Southern Africa, in the Years 1803, 1804, 1805, and 1806*, 14; Percival, *An Account of the Cape of Good Hope*, 60–61; Burchell, *Travels in the Interior of Southern Africa*, *Vol. I*, 175.
[90] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 24.

> "*Stuurman hot*! *Bootsman hoar*!" or vice versa, and one is astonished to see the… animals immediately turning right or left at the call.[91]

Uninitiated oxen were inspanned with older oxen, and the process took four days of intense flogging. The 'training' process required a psychological breakdown, in which the oxen were forced into a dreary fate. Oxen disobedience and infractions, however marginal, resulted in heavy floggings. That cattle could hear sounds at higher frequencies than humans and shouting caused them alarm, disorientation and fear, was used against them. The oxen were shouted at and beaten *individually* – this brought home to them the understanding that individual actions caused individual consequences. Infraction equalled punishment – screams and lashes. Their intelligence and experience was used against them: those most responsive to their names lead the span, while the newly broken-in oxen were placed in the middle. Oxen responding to their names clearly demonstrates their ability to anticipate likely future events, namely that when shouted at by name non-compliance would be followed by pain. This suggests that cattle have the capacity to learn and remember, and that they have a sense of time, and a sense of causality. This also speaks to the likely constant state of psychological distress that the oxen were in. This is because during journeys the agents of the oxen's suffering were around the oxen at almost every moment of every day. Studies into cattle's brain and blood biomarkers of stress-related psychological disorders, such as Post-Traumatic Stress Disorder (PTSD), have shown that when exposed to wolf simulations, cattle who have hitherto been exposed to wolves present biomarkers of psychological disorders whereas wolf-naïve cattle do not.[92] Cattle recall previous threats and are physiologically and psychologically distressed by recurrent threats.[93]

The psychological effects of making other mammals, namely elephants, submit to forced labour offers insights into oxen's likely psychological consequences of being broken in to wagon labour. Researchers who studied compelled elephant labour in Thailand argued that a combination of psychological torture and chronic physical abuse was required to make

[91] *Ibid*, 200–201.
[92] R. Cooke *et al*., 'Effects of a Simulated Wolf Encounter on Brain and Blood Biomarkers of Stress-Related Psychological Disorders in Beef Cows with or without Previous Exposure to Wolves', *Journal of Animal Science* 95, 3 (2017), 1154–55.
[93] *Ibid,* 1155.

elephants ridable for tourists.[94] This 'domination-based' approach resulted in elephants' 'psychological and physical breakdown[s]'.[95] The psychological effect for the elephants was among other things PTSD.[96] It is plausible to think that the oxen initiated into wagon labour also suffered PTSD, since they, like the Thailand elephants, endured chronic physical abuse and psychological torment. That the oxen were 'shivering and shaking', once dominated into the yoke, is plausibly indicative of their torment. The oxen then became dependent upon their masters for rest, food, and water – which could be withheld as punishment. The psychological breakdown involved in initial inspanning bears emphasis because all oxen who became wagon labourers in southern Africa, from the mid-seventeenth to the early twentieth century, endured some variation of this process. They were all broken down psychologically, endured chronic physical abuse, were screamed at individually, and many plausibly suffered PTSD.

Otto Mentzel also left more focused descriptions on the oxen in the yoke, which he disparaged as 'most impracticable' – *abgeschmackteste*, which connotes that which is superlatively absurd/vulgar/tasteless.[97]

> On the necks of the animals inspanned side by side, lies a round piece of wood…In it are four holes, through which bars (*Jukscheiden*) are pushed; two for each ox; these hang along the animal's neck and are fastened below the neck with a small piece of rope. One of these yokes, for the hindmost pair of oxen (called "Achterossen") is chained to the front of the shaft with an iron ring and staple; but for the other four pairs of oxen it is fastened to a chain, rope or cord…the oxen merely push the yoke before them, so that the wagon connected to the hindmost yoke by its shaft and to the foremost yoke by the long chain or rope, has to follow. I could not help pitying the poor animals that were tortured in this way. For since the hindmost yoke is tied to the front of the shaft and as both oxen are held under one immovable yoke, one may easily imagine how the animals are flung from one side to the other by the shaft whenever the wagon moves from side to side. On all rocky and uneven roads, such as have a high track on one side and a lower one on the other, the conditions are very bad, and it would not be surprising if the hindmost pair of oxen quite often had their necks broken; for if by chance a loaded

[94] J. Rizzolo and G. Bradshaw, 'Human Leisure/ Elephant Breakdown: Impacts of Tourism on Asian Elephants', in N. Carr and J. Young (eds.), *Wild Animals and Leisure: Rights and Wellbeing* (New York: Routledge, 2018), 113–14.
[95] *Ibid*, 113.
[96] G. Bradshaw, *Elephants on the Edge: What Animals Teach Us about Humanity* (New Haven: Yale University Press, 2009), 82, 109–10, 221–23.
[97] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 231; Mentzel, *Vollständige Und Zuverlässige Geographische Und Topographische Beschreibung Des Berühmten Und in Aller Betrachtung So Merckwürdigen Afrikanischen*, 231.

> wagon should overturn, the hindmost two oxen would have to fall with it, unless the bars of the yoke should snap and the oxen be thus freed from the yoke. But one can imagine what the animals have to endure when they are twisted and choked by the yoke... No ox can defend itself with its head and horns against insects, wasps, gadflies and hornets, for since it is inspanned and imprisoned under one yoke with another ox, it cannot move its head.[98]

The oxen at the back of the span, nearest the wagon, had yokes connected to the wagon. The oxen in the front and middle of the span had yokes connected to the yokes of the hindmost oxen. The hindmost pair of oxen could not move their necks, so that if the wagon became unbalanced or crashed, they followed it. The wood which connected the other oxen to their paired mates meant that one ox slipping caused the other to follow. Otto Mentzel considered this method of yoking *martern*, torture. His German text reads: *Ich habe es nie ohne Mitleiden ansehen können, wie das arme Vieh auf diese Weise gemartert und geplagt wird*.[99] Translated, this means: I have never been able to see without pity how the poor cattle are tortured and plagued in this way. The word *gemartert* is a past-tense derivative of *martern*, which according to a 1783 dictionary signified the verb 'to torture'.[100] *Geplagt* at the time meant tormented or vexed.[101] In his view, for the oxen, yoking cattle and forcing them to pull or push wagons was a form of torture. The English translation deployed the word torture on four occasions when Otto Mentzel was referring to oxen labour.[102] The explicitness of his views are rare because he viewed the oxen more sympathetically than many other observers; he acknowledged to a greater degree that they were beings capable of feelings and experiences. What did cattle do in response to these new forms of labour? Jan van Riebeeck's *Journal* reveals frequent complaints and mentions of cattle he had trafficked being stolen.[103] Otto Mentzel took a different view, he argued that cattle ran away to escape back to their previous masters. He claimed the motivation for the early VOC outpost at Salt River was:

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[98] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 146–47.
[99] Mentzel, *Vollständige Und Zuverlässige Geographische Und Topographische Beschreibung Des Berühmten Und in Aller Betrachtung So Merckwürdigen Afrikanischen*, 232.
[100] N. Bailey, *A Compleat English Dictionary Oder Vollständiges Englisch-Deutsches Wörterbuch* (Leipzig: Waysenhaus und Frommannische Buchhandlung, 1783), 823.
[101] *Ibid*, 853.
[102] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 147, 148, 173.
[103] van Riebeeck, *Journal of Jan Van Riebeeck Volume 1, 1651-1655*, 183, 191, 192, 195, 206, 207, 227, 232, 249, 297, 324, 370, 376.

> to see that the cattle bartered with the Hottentots did not cross the Salt River and return to their homes. The Hottentot cattle still retain this habit on all possible occasions up to the present day, and thereby make it clear that they prefer staying with the… Hottentots to being forced to do hard labour for more civilised people.[104]

On his view, when cattle went missing it was 'more probable that the missing oxen turned back and returned to their former masters, the Hottentots'.[105] He was probably right because for the next 120 years there are manifold examples of oxen fleeing their station as wagon labourers.[106] The practice of tying oxen up at night during travels was commonplace, lest the oxen 'strayed'. That oxen probably ran away from VOC and other settler masters does not imply that cattle lived merry lives with the Khoikhoi. There are many descriptions of the stick-through-the-nose method of making cattle ridable. Here is one from Mentzel's stay during the 1730s:

> When Hottentots leave their former haunts and migrate to a different locality, they take their huts apart and put them on a pack-ox together with all their effects. A stick is then thrust through the nose of this animal and if it refuses to follow is led by it. For this purpose a hole is pierced through the wall separating the two nostrils while the animal is still young, and kept open to prevent it from growing together. When the ox is about to be laden a stick about 18 inches long, with a little barbed hook at one end to keep it from falling out, is thrust through the hole. Since this hurts the animal it is forced to stand still and suffer whatever treatment to which it may be subjected. If the ox refuses to follow willingly, it is guided or led by this stick. If it moves without being guided it turns its head at each step to the side towards which the stick swings, from which one may infer that this nose-band must be painful to the animal.[107]

This stick approach was corroborated by many later observers.[108] Cattle's noses contain many nerves, meaning that acute pain was felt by the oxen when their noses were thus pierced.[109]

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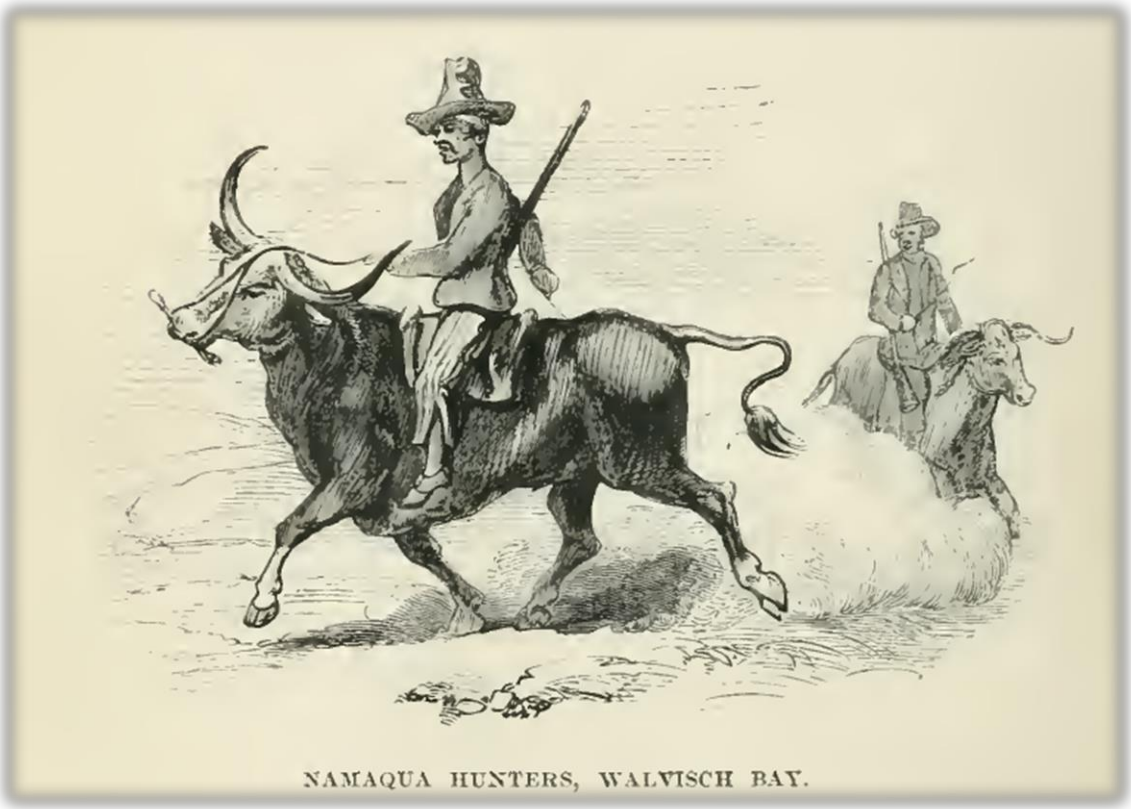
[104] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 32.
[105] Mentzel, 33.
[106] Burchell, *Travels in the Interior of Southern Africa*, *Vol. I*, 303, 433, 450, 510, 549; Moffat, *Missionary Labours and Scenes in Southern Africa*, 27, 99, 102, 107; Baines, *Explorations in South-West Africa*, 81, 85, 96, 125, 227, 403; Livingstone, *Missionary Travels and Researches in South Africa*, 57, 168; Napier, *Excursions in Southern Africa*, *Vol. II,* 38.
[107] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 295.
[108] See for example Sparrman, *A Voyage to the Cape of Good Hope*, *Vol. I*, 237–38; Baines, *Explorations in South-West Africa*, 379.
[109] I. Salazar *et al*., 'Anatomical, Immnunohistochemical and Physiological Characteristics of the Vomeronasal Vessels in Cows and Their Possible Role in Vomeronasal Reception', *Journal of Anatomy* 212, 5 (2008), 686–96.

That they could be directed in this way further evidences this. Thomas Baines in the early 1860s depicted oxen in what became Namibia being controlled and ridden in this way. Like wagon labour, this form of oxen labour spread across the region. This way of riding cattle was also adopted by the Xhosa and Basuto tribes, the latter, according to one account, using a grass or cattle skin (leather) rope instead of a stick.[110]

Image 2.6. Thomas Baines' depiction of the stick-through-the-nose method of riding cattle in South West Africa



Source: Baines, *Explorations in South-West Africa*, 10.

Trailed by traders, settlers, and missionaries, in the seventeenth and eighteenth centuries, trekboers trekked further inland, freighted by oxen labourers.[111] Oxen's labours were perceived by trekkers and their followers as a necessity.

[110] M. Martin, *Basutoland: Its Legends and Customs* (London: Nicols & Co, 1903), 8–9.
[111] Swart, *Riding High: Horses, Humans and History in South Africa*, 41.

Image 2.7. Oxen pulling a missionary's wagon

Source: Burman, *Towards the Far Horizon*, 87.

By the 1760s much of the west coast of what became South Africa, up to Namaqualand, and the south coast to the Great Fish River, towards the edges of the little Karoo were patchily inhabited by the migrating trekboers. The north and east regions of this area were unoccupied by Europeans.[112] Over the next four decades travellers, scientists, hunters, and clergy moved and lived in this area.

One such scientific traveller was Carl Linnaeus's student, Anders Sparrman, who travelled in the Cape for nine months between 1772 and 1776 and made contributions to zoology and botany.[113] He was also an ardent hunter and enjoyed killing a wide assortment of animals. Nicole Ulrich examined Anders Sparrman's writings on the 'labouring poor' humans, such as 'sailors, servants, guides and wagon drivers'.[114] The oxen were not regarded as labourers in her analysis and, without recognising it as such, Nicole Ulrich said of oxen's labour only that the 'management of the oxen demanded much skill'.[115] Anders Sparrman left some remarkable descriptions of oxen's labour, however. The following is a description of his oxen-pulled ascent of that forbidding Hottentots Holland range in 1775.

> [W]e got up by day-break, in order to take our journey over Hottentots Holland's-Mountain, in the cool of the morning. The way up it was very steep, stony, winding, and, in other respects, very inconvenient. Directly to the right of the road there was a perpendicular precipice, down which, it is said, that waggons and cattle together have sometimes the misfortune to fall headlong, and are dallied to pieces. It is said too, that in order to drive up this and other mountains of the kind, even with the strongest team of oxen, a man must not only have the knack, as it is called, and a perfect government of the beasts, but must also at the same time make use of a whip like that of the African waggoners. These whips are fifteen feet long, with a thong somewhat longer, and a lash three feet in length, made of stout white leather. This (in a certain sense) most powerful instrument in getting the waggon forward, the driver holds with both hands, and, sitting on the seat of the carriage, can reach the fifth pair with it, and at the same time smack his whip, when necessary, and distribute his cuts and lashes among the oxen without intermission, never failing to touch them on the very spot he wishes, so that the very hairs come away with the whip. By this means he possesses such an ascendency over them, as to oblige them to join their strength all at once, and pull the waggon out of deep pits, or lift it over large stones and precipices that lie in the road. But it requires a great nicety of attention, not to drive them too far

[112] Joubert, 'An Historical Perspective on Animal Power Use in South Africa', 127.
[113] Beinart, 'Men, Science, Travel and Nature in the Eighteenth and Nineteenth-century Cape', 778.
[114] Ulrich, 'Dr Anders Sparrman: Travelling with the Labouring Poor in the Late Eighteenth-Century Cape', 731.
[115] *Ibid*, 743.

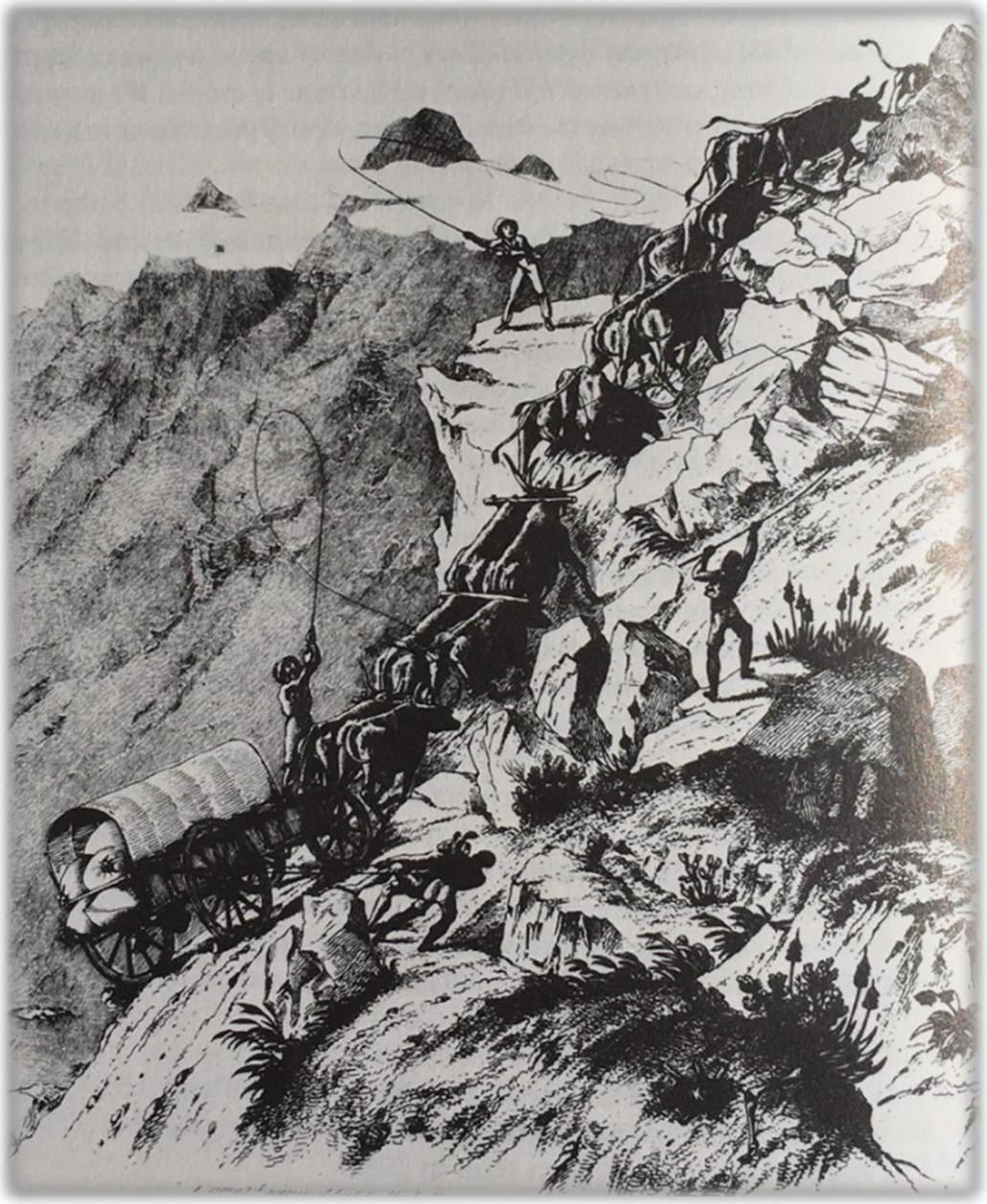
> at once, nor to rest them too long at a time; as in the former case they grow faint, weary, and, in consequence of this, restive; and in the latter case, they lose the spirit to which they have been previously wrought up, and which is necessary for the getting them on; and for want of which it often happens, that the waggon cannot he got from the spot. [116]

Much is worth isolating in the above quote. Anders Sparrman's taxonomy places the wagons and the cattle in the same category, in that they both sometimes have the 'misfortune' of falling headlong down the mountain. The oxen and the wagons are objects in this view. These misfortunes also speak to the deadly occupational hazards which accompanied oxen's wagon labour. Domination of the cattle was extreme, to achieve 'perfect government' of them. Such 'ascendancy' over them was achieved by distributing 'without intermission' lashes and cuts from whips. Whips, he says, were the 'most powerful instrument in getting the waggon forward'. There are also indications of oxen agency, such as their becoming 'restive', or their refusal to move after a period of rest, which he says 'often happen[ed]'. Oxen required spirit, *gees*, to transit over mountains. The epigraphs of this chapter also demonstrate oxen's agency, in that the oxen 'lowed piteously' before summitting a mountain pass, refused food after one of their kin were slain, and sometimes simply refused to work.

A human-centred history such as Nicole Ulrich's, which misperceives animals as non-subjects, can interpret such passages and consider that the point worth making is that the wagon drivers possessed 'much skill', which is to mirror Anders Sparrman's own view.[117] At the same time, it elides the oxen's own forced and harrowing labour contributions. Oxen were in fact often yoked into a bi-directional whipping regime, particularly on more arduous terrains: flogged by a man or boy walking to the side of the front oxen, and the driver who sat on the wagon behind the rear oxen.[118] Road builder Charles Mitchell's later drawing of oxen ascending the Cradock Kloof depicts this whipping regime.

[116] Sparrman, *A Voyage to the Cape of Good Hope*, *Vol. I*, 122–23.
[117] Ulrich, 'Dr Anders Sparrman: Travelling with the Labouring Poor in the Late Eighteenth-Century Cape', 743.
[118] Lichtenstein, *Travels in Southern Africa, in the Years 1803, 1804, 1805, and 1806*, 15.

Image 2.8. Charles Mitchell's 'State of Cradock's Pass' in 1840



Source: Burman, *Towards the Far Horizon*, 84.

It is reasonable to assume that, for oxen, chronic suffering was a core part of their forced wagon labour. This would include chronic pain from whipping and whip-wounds, muscle pain and ligament damage from grinding over rocks and mountain passes, the chaffing from the yoke, the psychological distress of frequent shouting, including likely PTSD, the distress of having their human tormentors nearby, and their anticipation of future agony. It is also very likely that the oxen suffered chronic disorders such as forms of arthritis, including

osteoarthritis, also known as degenerative joint disease, which is currently 'commonly reported in cattle'.[119] Historically, arthritis is well documented in cattle, with one veterinary researcher noting that arthritis 'has been recognized in this species [cattle] since the beginning of veterinary history', as evidenced in analyses of old skeletons.[120] Inflammatory arthritis in cattle is often coextensive with 'systemic manifestations such as elevated body temperature, hot swollen joints, anorexia, depressed appetite, suppressed ruminations, and obvious pain that is not alleviated when the animal is recumbent.'[121] Degenerative joint disease in cattle 'often is a chronic debilitating condition'.[122] Given the arduous labours of wagon pulling it is reasonable to infer that many oxen were afflicted by painful arthritis and degenerative joint disease. This connects to oxen's agency. It is likely that oxen, as a team, were forced to choose between either being whipped and shouted at, or the pain of their grinding arthritic joints as they walked on. In that oxen were yoked in teams, many oxen plausibly had no choice but to drive forward with the fellow oxen, impelled along by each other, the slope of the terrain, and/or their distance from or to pasturage and water.[123] In light of this, travellers' frequent mentions of oxen running away and lesser forms of resistance is readily understandable.[124]

Unlike Otto Mentzel, Anders Sparrman was unfeeling towards oxen labourers. He did, however, leave rich descriptions of the way oxen were yoked, the way cattle were individually shouted at, broken in to wagon labour, sometimes had to swim across rivers, and that oxen were intelligent enough to navigate their own way home after being turned loose. [125]

[119] J. Barbosa *et al*., 'Degenerative Joint Disease in Cattle and Buffaloes in the Amazon Region: A Retrospective Study', *Pesquisa Veterinária Brasileira* 34, 9 (2014), 846.
[120] J. Shupe, 'Arthritis in Cattle', *Canadian Veterinary Journal* 2, 10 (1961), 369.
[121] *Ibid*, 374.
[122] *Ibid*.
[123] My thanks to Les Mitchell for making some of these points to me and for the above two references.
[124] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 32, 200; Moffat, *Missionary Labours and Scenes in Southern Africa*, 26, 99, 102, 107; Baines, *Explorations in South-West Africa*, 81, 85, 96, 125, 227, 340, 342, 403; Livingstone, *Missionary Travels and Researches in South Africa*, 17, 322; Napier, *Excursions in Southern Africa*, *Vol. II*, 38; Sparrman, *A Voyage to the Cape of Good Hope*, *Vol. I*, 39–41, 294; Le Vaillant, *Travels into the Interior Parts of Africa*, 228; Barrow, *Travels into the Interior of Southern Africa*, 30, 398, 433, 450, 549.
[125] Sparrman, *A Voyage to the Cape of Good Hope*, *Vol. I*, 127–28, 133–34, 295.

Ornithologist François Le Vaillant travelled in southern Africa between 1781 and 1785, including one trip to the border region of what became South Africa and Namibia, and another east of the Cape.[126] He made major contributions to ornithology and innovated a new genre, namely, the illustrated bird book.[127] Although his writings were professionally edited, they remain important descriptions of oxen labours. [128]

François Le Vaillant's journeys were multi-species endeavours. Describing his entourage during his journey to Namaqualand, he notes that he travelled with two wagons, 19 humans, 13 dogs, three 'milch' cows, 36 primary oxen labourers, another 14 oxen for relays, 11 goats, and for his 'amusement' and 'society' a baboon named Kees, whom he had chained up in the Cape but who nonetheless acted as a protective, quasi-body guard, and of whom he says by 'the acuteness of his smell, his hearing, and his sight, this animal was always the first to put us on our guard against danger'.[129] Baboons were commonly used as security and lookouts for Boers in the nineteenth century.[130]

Reflecting on his previous journey to the east of the Cape, he addressed future travellers, saying 'they must expect to suffer amidst the deserts of Africa, if they do not provide themselves with oxen as friends, and young goats as play-fellows'.[131] But suffer the cattle did. He says 'in the midst of a dry and burning desert' he was 'obliged to abandon [his] waggons and effects', after watching his oxen 'perish with thirst'.[132] He wrote movingly on the oxen's desperation for water.[133] On one occasion along a river bank, the sand was so soft that wagon wheels sunk almost halfway into the sand, and 16 oxen were yoked into each wagon.[134]

Like David Livingstone, who I discuss later, François Le Vaillant was *from a cattle perspective* dangerously ignorant in the face of desert conditions, when he, François Le Vaillant,

[126] Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa*, 122.
[127] I. Glenn, 'Levaillant's Bird Books and the Origins of a Genre' *Alternation* 16 (2009), 91–101.
[128] Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa*, 17.
[129] Le Vaillant, *Travels into the Interior Parts of Africa*, 16–17, 19, 172–73, 269.
[130] J-B. Gewald, 'Brothers in Arms: Baboon-Human Interactions, a Southern African Perspective', in J-B. Gewald, M. Spierenburg, and H. Wels (eds.), *Nature Conservation in Southern Africa Morality and Marginality: Towards Sentient Conservation* (Leiden: Brill, 2018), 56–58.
[131] Le Vaillant, *Travels into the Interior Parts of Africa*, 24.
[132] *Ibid*, 170.
[133] *Ibid*, 278–79.
[134] *Ibid*, 209–10.

proceeded into cattle-fatal landscapes such as the Namaqualand desert. After arriving at Oliphant's Kop, long without water and food, and where there was yet neither water nor food, and wanting to continue travelling, he told his servants to yoke the oxen, but when they began to 'harness [the] oxen, not one of them was found fit for service, they all lay down around the waggon so apparently exhausted that there was reason to apprehend they would never rise again upon their legs'.[135] The occupational hazards for the oxen were extreme. 'Of the fifty-four oxen with which I began my journey, thirty-one had died', he says, a death rate of 57%.[136] In the midst of this hardship, he leaves evidence of what is likely oxen's empathy, however. Describing an accident during a descent, where one of his Khoikhoi companions, Klaas, slipped off the front of the wagon, and after which six oxen walked over his body, so that he expected serious injury, he says:

> [Klaas] had… suffered some contusions from the oxen; but these animals had, from an instinct of which I admired the sagacity, spared him from as much as circumstances would allow: and indeed it is almost incredible that so many feet would have passed over him without crushing him to death.[137]

In his view, the cattle's 'sagacity' had spared Klaas a likely death. So, in conditions in which more than half of them would perish, and after suffering much deprivation, whipping, and drudging desert toil, the oxen appeared to seek no revenge and perhaps mustered empathy for Klaas.

Sometimes the hardships of wagon labour, like exhaustion, thirst, hunger, and bodily pain were so intense for oxen that dexterous, unremitting whipping was not enough to drive them forward. Captain Robert Percival, who would later lead the British attack against the Dutch at Muizenberg, described a case where flogging was insufficient.

> The means employed to render the cattle manageable are, however, revolting to humanity. It excites not only compassion but horror to see many of these unfortunate beasts cut and mangled, as they are, in various parts of the body; for a Dutch boor, or farmer, if he finds his cattle lazy, or stopping from fatigue, or where they meet with obstacles which their strength cannot easily surmount, will not

[135] *Ibid*, 281.
[136] *Ibid*, 277.
[137] *Ibid*, 229.

> hesitate to draw out his great knife and score their flesh, or even cut slices off without mercy. These wretched animals seem indeed to know their cruel master's intentions; for their fear and agitation become excessive when they observe him taking out the instrument, and rubbing it to the waggon, as if making ready for the purpose of tormenting them.[138]

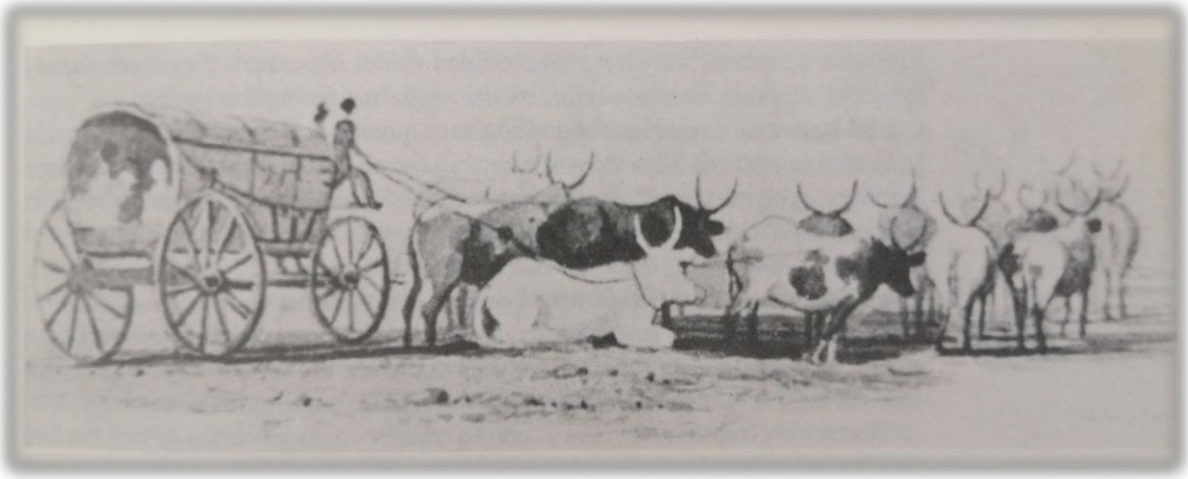
The sound of a knife scraping against a wagon indicated to the oxen that disobedience would be followed by cuts and stabbings. These oxen were not knife-naïve. It is unlikely that Robert Percival's above account was fictive and informed by his prejudice against and low views of the Dutch. Anne Barnard, who was in the Cape and travelled at times between 1797 and 1802, claimed to have seen the effects of the knife-stimulus method used against oxen, also. After descending Hottentots Holland, she writes:

> Mr. Barnard stood by the team of oxen, and called, "Anne, don't look this way!" but, at the sound of his voice, I naturally and involuntarily turned my head, and saw what made my heart sore, how much the poor animals had suffered in our service, their sides streaming down with the blood which the knives of their savage drivers had brought. They are very cruel here to their cattle; the whip itself, which carries away with it the hide, is not thought enough on some occasions; with their sharp knives they cut the poor creatures, till, bellowing and kicking, they perform their almost impossible task, and they are sufficiently good anatomists to know exactly the vital parts to be avoided.[139]

Some aspects of oxen's wagon labour applied to all oxen who pulled wagons up mountains and into waterless and scorching desert terrain, for example. Virtually all the accounts examined in this chapter confirm that oxen were each called by name, and all regarded wagon labour as extremely hard and often deadly. But there was variation in how oxen were treated by their drivers and masters.

[138] Percival, *An Account of the Cape of Good Hope*, 57–58.
[139] Barnard, *South Africa a Century Ago (1797 - 1801)*, 162.

Image 2.9. Sketch of an oxen span and a light wagon, 1798, Anne Barnard



Source: Burman, *Towards the Far Horizon*, 35.

The German doctor Hinrich Lichtenstein, who travelled in the Cape between 1802 and 1806, and became the Cape governor's personal physician, said that among 'well-ordered teams' the whip was used only when full exertion was expected from the oxen. The 'drivers manage the animals with merely calling to them; every ox has his particular name', and whips, he wrote, 'are very seldom used among a well-ordered team; never unless any of the poor creatures happen to be extremely weary, or the difficulties to be encountered in the way render a more than usual exertion of strength necessary'.[140]

Over the eighteenth century, numbers of settlers increased. Whereas soon after the VOC occupied the Cape there were several hundred settlers, by 1798 the population of Khoikhoi, slaves, and European settlers had reached 60 000.[141] The VOC was liquidated by 1795, and Dutch fears that the British would take control of the Cape seemed less paranoid and more likely. At the turn of the nineteenth century, the colonial power balance at the Cape and globally was shifting. There were also significant shifts in transport and oxen labour – though these would take some time to manifest.

[140] Lichtenstein, *Travels in Southern Africa, in the Years 1803, 1804, 1805, and 1806*, 14.
[141] Huigen, *Knowledge and Colonialism: Eighteenth-Century Travellers in South Africa*, 10.

The expansion and demise of oxen's wagon labour, 1801–c1890s

The first public transport system was set up in 1801, comprising a routinised passenger-carrying wagon operation between Simonstown and Cape Town, known as a post-wagon.[142] Now post and wagonless persons could be freighted by wagon weekly. These were pulled by horses and were swifter than oxen-pulled wagons. European explorations into southern Africa were increasing, as were the number of oxen labourers, who would connect the region by the end of the nineteenth century. In 1801 an expedition to the Tswana interior powered by a caravan of oxen-pulled wagons was led by Petrus Truter and William Somerville.[143]

Around this time, especially the mountain passes and the wagon roads further inland from the Cape were often arduous and fatal for oxen. As Hinrich Lichtenstein put it, 'the interior of the colony', was in 'the highest state of dilapidation' – and to give an indication 'of the difficulties to be encountered in taking long journeys in this country' he described a case in which 24 oxen were required to pull two connected wagons and during which 'great efforts were necessary to get them on'.[144] In 1805 a Cape Ordinance stated that

> One of the most effectual means to promote internal trade and civilisation is a regular and safe inland communication; the Field Cornets [military officers or local government officials] shall take particular care, therefore, to establish this.[145]

Wagon transport was proliferating quickly, and would only increase over the nineteenth century. Already in the early 1800s, 5000 wagons passed over Hottentot Hollands Kloof.[146] The period between 1806 and 1895 saw 'formal, permanent road construction… carried out vigorously in the Cape'.[147] This was especially so after the British took control of the Cape in 1814. Describing a road near Salt River towards the Cape Flats, in 1815, William Burchell noted that 'waggons are constantly passing to and from distant parts of the colony'.[148]

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[142] L. Green, *A Taste of the South-Easter* (Cape Town: Howard Timmins, 1971), 107.
[143] G. Theal, *History of South Africa since September 1795* (London: Swan Sonnenschein & Co, 1908), 87–91.
[144] Lichtenstein, *Travels in Southern Africa, in the Years 1803, 1804, 1805, and 1806*, 42–43.
[145] Mitchell, 'Setting the Scene: A Brief History of Transport Infrastructure in South Africa', 37.
[146] Ross, *Mountain Passes, Roads, and Transportation in the Cape*, 136.
[147] Mitchell, 'Setting the Scene: A Brief History of Transport Infrastructure in South Africa', 37.
[148] Burchell, *Travels in the Interior of Southern Africa*, *Vol. I*, 52.

When the 1820 settlers arrived at Algoa Bay, adjacent to Port Elizabeth, they were met by spans of oxen wagon labourers ready to freight them into the colony.[149] According to the 'Regulations for the Introduction of Agricultural Emigrants into the Cape of Good Hope', rule eight, the British government was to 'provide and pay for their land transport, in wagons or other vehicles to their respective locations'.[150] The mountain passes remained extremely dangerous for oxen in the early nineteenth century. For instance, of the 4000 wagons which crossed the Hottentots Holland Kloof in 1823 - implying over 48 000 oxen labourers - 800 wagons were damaged by accidents (20%), meaning that over 9600 oxen labourers were involved in accidents, on that one pass, in one year.[151] With British control over the Cape came a new set of travel expectations. The British looked down upon the Dutch mode of kakebeen wagon transport. Its robust versatility and capacity to grind over large rocks and up steep passes was looked upon less as innovation and more as short-sightedness, and an obstacle to efficiency, punctuality, and trade.

In the 1830s transport by oxen-pulled wagons was relatively slow. There was variation in speed depending on the terrain, access to pasturage and water, and weather. In 1836 a wagon with ten to twelve oxen labourers, road depending, could travel between four and six kilometres per hour. Oxen laboured for eight hours a day, a 'schoft', shift, often pulling during the cool early morning and late afternoon. On an even road, 20 to 25 kilometres was a good distance to cover in one day, but more than 16 kilometres was seldom achieved until late into the century.[152] Where there were rivers or mountains the distance was shorter still.[153]

Travel into the neighbouring areas of what became South Africa was not well established in the early nineteenth century. For example, James Alexander, after whom Alexander Bay at the Orange River was named, took eight months to travel by oxen-pulled wagons from Cape

[149] Silver and Co, *S. W Silver & Co's Handbook to South Africa*, 34; J. Noble, *History, Productions and Resources of the Cape of Good Hope* (Cape Town: W. A Richards & Sons, 1886), 53.
[150] Silver and Co, *S. W Silver & Co's Handbook to South Africa*, 342–43.
[151] Burman, *Towards the Far Horizon*, 71. This assumes, conservatively, an average of 12 oxen per wagon.
[152] Morris, *The Washing of the Spears*, 312.
[153] E. Burrows, *Overberg Odyssey: People, Roads, and Early Days* (Swellendam: Swellendam Trust, 1994), 25; See also Ross, *Mountain Passes, Roads, and Transportation in the Cape - a Guide to Research*, 179; See also Burman, *Towards the Far Horizon*, 58–66.

Town to Walvisch Bay in what became Namibia. Oxen were martyred in great numbers on this expedition, and for them near-death experiences were frequent. On one occasion, after finding pasturage, he wrote,

> [o]ur herd had not seen more grass than would have satisfied one of them, since we left Kuisip at Hou'tous, three days before, and eighty miles distant; they now rioted in plenty.[154]

He left Cape Town on 10 September 1836, and arrived at Walvisch Bay on 19 April 1837, 'and in the horizon gleamed the welcome ocean, now reached for the first time at this point from the Cape, from which it is distant 12 degrees of latitude', he wrote, on arriving there.[155] Back at the Cape, around the same time, thousands of trekboers and settler farmers were increasingly dissatisfied with British rule of the Cape Colony, and they started migrating into the interior of what became South Africa.

Though their journeys and contributions to the Great Trek, in which myriad cattle and oxen pulled and accompanied thousands of voortrekkers, first trekkers, and trekboers into the interior of southern Africa from the mid-1830s requires a book of its own, here I emphasise only that oxen laboured with the trekkers to open up South Africa's interior to colonial settlement and wheeled transport in ways that are not well recognised. This is not to suggest that wagons were not north of the Cape before the Great Trek.[156]

The contemporary South African word *gees* means 'spirit', and has wider connotations of grit, hardiness, hardy enthusiasm, vitality, liveliness, tenacity, resilience, and stamina. *Gees* has its origin in the parent term *trek gees*, which likely emerged during the voortrekker and trekboer migrations into the interior of southern Africa, and denotes the spirit with which they faced the region's harsh, and to them, mostly unknown interior.[157] The term trek gees was an

[154] J. Alexander, *An Expedition of Discovery into the Interior of Africa*, *Vol. II* (London: Henry Colburn, 1838), 115.
[155] J. Alexander, *An Expedition of Discovery into the Interior of Africa*, *Vol. I* (Philadelphia: E. L Carey and A. Hart, 1838), 20; Alexander, *An Expedition of Discovery into the Interior of Africa, Vol. II,* 1838, 76–77.
[156] P. Landau, *Popular Politics in the History of South Africa, 1400–1948* (Cambridge: Cambridge University Press, 2010), 14, 16, 22–25, 118; V. Malherbe, 'The Life and Times of Cupido Kakkerlak', *The Journal of African History* 20, 3 (1979), 370.
[157] Burman, *Towards the Far Horizon*, 156.

important concept to Afrikaaner trekkers who, after 1885, trekked north of the Transvaal, into the Kalahari Desert in modern-day Namibia and Botswana, and as far north as Angola.[158] But, what is elided and unrecognised in the term *gees* is that it was not only the voortrekkers and trekboers' *trek gees*, but also the oxen's *gees* – under duress of whips and sometimes knives, in conditions of acute hardship, including scorching sun, starvation, severe water-deprivation, and fatigue that could reach a fatal pitch – which enabled these migrations. It was the oxen's resilience that underpinned the voortrekkers' *gees*. Oxen possessed the true *gees* or *trek gees* which today still resonates in a broader South African colloquial vocabulary. It was on the backs of oxen that the trekboers established the Transvaal and Free State Republics. Oxen forged the paths that connected the interior of South and southern Africa to the Cape Colony.

Image 2.10. Oxen pulling trekboer wagons during Great Trek in Transvaal, anonymous

Source: Burman, *Towards the Far Horizon*, 117.

But, while oxen-pulled wagons were for Dutch descendants a core part of their culture and heritage, the British increasingly looked at their wagons with disdain. In the mid-1840s multi-book author Lieutenant colonel Edward Napier, who fought in the seventh Frontier war

[158] *Ibid*, 156–159.

against the amaXhosa, illustrated this kind of view. He described the Dutch wagons as 'cumbersome' and 'sluggish', moving in 'slow and sleepy succession' – galvanised only by 'dint of incredible exertion of whips and lungs – of blows and oaths'.[159] His attitude towards wagons, albeit in a military context, signified a broader shift in view regarding wagon transport, after the British took control of the Cape. He wrote:

> As these sluggish convoys drag their long and weary length, they are at every step in danger of being cut off by an active, unseen and lurking foe…But such is the force of prejudice and habit! Because Van Riebeeck's followers travelled, in days of yore, with these unwieldly conveyances, not only do they continue to be used by their descendants, at the present day, but the English Settlers must also needs follow their example… a system entirely subversive of everything like punctuality, certainty, or celerity… We have, during the course of our wonderings, been driven by many strange modes of transport and locomotion, from a donkey to an elephant – from a dooly [i.e., palanquin] to an express-train…never in our peregrinations did it fall to our lot to meet with such 'slow coaches' as the aforesaid bullock waggons of Southern Africa.[160]

The British around that time were at the height of the industrial revolution, they were a superpower empire, advancing quickly in terms of trade, imperialism, and technology. To many of them, southern Africa was a backwater, and the semi-nomadic Afrikaner trekboers and farmers were primitive and backward. For cattle, British and Dutch colonialism were discrete processes with distinct impacts.

The hardships and hazards accompanying oxen's wagon labour were by no means lessened by the 1840s. Speaking of long journeys in the interior of what became South Africa, Edward Napier said that 'spare horses and oxen in great numbers must be provided, to replace losses by accidents, death and other contingencies', such as death by tsetse flies.[161]

Importantly for cattle's experiences as wagon labourers, one thing the British authorities did in the Cape and later elsewhere was to carve out mountain passes to make wagon travel

[159] Napier, *Excursions in Southern Africa, Vol. II*, 2.
[160] *Ibid*, 2–3.
[161] *Ibid*, 176.

easier. Sir Lowry Cole, writing to the Secretary of State for the Colonies in 1830, in defence of having opened what became Sir Lowry's Pass near Grabouw, without prior approval, said:

> The colony is miserably poor, with a population separated from the more civilised parts by mountains over which there are few passes. Being cut off from a market for their produce there is no stimulus for industry and the inhabitants must ever remain in their present state of poverty and semi-barbarism until these passes are made passable.[162]

Thereafter many mountain passes were constructed, such as Franshoek, Cole's Pass, Houw Hoek (1831), and thereafter Hex River Pass, Bainskloof, Mitchell's Pass and myriad others.[163] In 1843 a road between Port Elizabeth and Cape Town was developed by bridging rivers and constructing the Montagu Pass, so that by 1849 this 965-kilometre trip regularly took three days by post-cart relays.[164] In 1847 road construction between Pietermaritzburg and Durban began.[165] After constructing a new road from the Cape Flats to past Stellenbosch in 1845, at a cost of £40 000, it was estimated that between 50 000 and 60 000 animal pulled vehicles would use the road per year.[166]

While road-and pass-construction was proceeding in earnest in the Cape, the rest of southern Africa still involved dreary and harsh conditions for oxen freighting travellers, explorers, settlers, and missionaries. David Livingstone, for example, on his journey in present-day Botswana, and just after 17 of his oxen labourers had run away from him, was warned of the serious desert conditions he would encounter by BaNgwato chief Sekgoma Kgari, who pleaded with him not to leave the Serotli spring: 'You will be killed by the sun and thirst and then all the white men will blame me for not saving you.'[167] In the mid-nineteenth century, oxen wagon labourers were still dying in great numbers while enabling European settlement and incursions into southern Africa.[168] At one point, while in what is today east-central

[162] Mitchell, 'Setting the Scene: A Brief History of Transport Infrastructure in South Africa', 37.
[163] *Ibid*; Ross, *Mountain Passes, Roads, and Transportation in the Cape*, 51–55, 171.
[164] Mitchell, 'Setting the Scene: A Brief History of Transport Infrastructure in South Africa', 38.
[165] Mitchell, 38.
[166] J. Bond, *They Were South Africans - 1820 Settlers* (Cape Town: Oxford University Press, 1956), 110.
[167] Livingstone, *Missionary Travels and Researches in South Africa*, 57.
[168] Compare this claim to concerns raised in J-B. Gewald, M. Spierenburg, and H. Wels, 'Introduction: People, Animals, and Marginality: Reconfiguring Wildlife Conservation in Southern Africa', in J-B. Gewald, M. Spierenburg, and H. Wels (eds.), *Nature Conservation in Southern Africa Morality and Marginality: Towards Sentient Conservation* (Leiden: Brill, 2018), 2–3.

Botswana, David Livingstone noted that before him in his journey lay 97 kilometres ('sixty miles') of waterless desert, with 'deep soft sand', which was 'very distressing for the oxen'.[169] He sent his herd to a well in Nkowane, and half of them died, while those he found alive had been without water for five days.[170]

When Thomas Baines travelled to what became Namibia in the early 1860s, he told of similar miseries for oxen wagon labourers. Frequently oxen serving him ran away or exhibited protestations, including one occasion when 'an entire span of oxen had escaped'.[171] The desert sand scorched oxen's feet and hooves. While in Swakopmund, he noted that the ground was 'thickly strewn with pebbles and quartz – fragments hard and sharp to the feet of oxen'.[172] It is remarkable how unchanging the process of yoking and inspanning oxen was from the time of Otto Mentzel's observations in the Cape in the 1730s to Thomas Baines' in the 1860s in Windhoek in present-day Namibia. He spoke of 'yet untrained' oxen taking a 'fearful amount of punishment'.[173] While stuck in a river in Windhoek with hired but uninitiated oxen:

> Half a score of active young Namaquas came to our help, and with shouts and screams, twisting and biting of tails, and every mode of inflicting pain (except the last resort of fire) that ingenuity could suggest, succeeded in forwarding us about half a mile before sunset.[174]

The next day, stuck again with non-psychologically broken-down oxen, he writes:

> we had a repetition of the same… At the next drift it struck again, and no persuasion could induce the oxen to draw it out; not that it was over-weighted now, but that none of our cattle had been properly trained to the yoke. One of the foremost lay down, and not until the third man had taken his spell with the long whip did he consent to spring to his feet again.[175]

[169] Livingstone, *Missionary Travels and Researches in South Africa*, 153.
[170] *Ibid*.
[171] Baines, *Explorations in South-West Africa*, 81, 85, 96, 227, 403.
[172] *Ibid*, 25.
[173] *Ibid*, 62.
[174] *Ibid*, 63.
[175] *Ibid*.

In a rare passage for accessing oxen's experiences of wagon labour, we learn that Thomas Baines was himself once lashed by a wagon whip (*voorslag*). He writes:

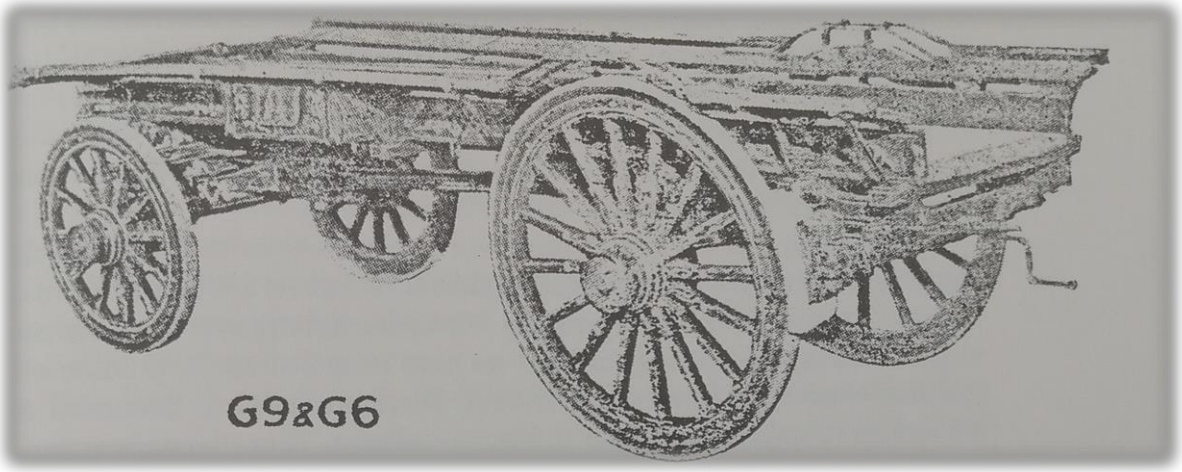
> I left Walvisch Bay and walked to the edge of the plain, on which I found the wagon with the oxen already inspanned: and cruel work this inspanning had been. One of the after oxen especially was covered with large wales, while the red blood stood in drops upon his back, till I felt almost tempted to give master Kachawbie a sample of the caravasse he wielded so unmercifully. In a short time I was better able to sympathise with the poor cattle, for Onesimus, in one of his back strokes, brought the long wagon-whip across the calf of my leg, raising a wale from front to rear as broad as two fingers and marking the path of the voorslag by a cut which even three weeks later was not quite healed.[176]

From when the first oxen wagon labourers were initiated in 1653 until the last in the early twentieth century, the process ineluctably involved intense psychological and physical abuse. Such was the labour and colonial impact on cattle experiences – it was a precondition for colonial settlement, trade, and regional transport.

Around the mid-nineteenth century, however, oxen wagon labour was shifting. A new wagon, the Bokwa wagon, had been designed; it was much heavier than the kakebeen wagon, and capable of hauling heavier loads. Transport wagons or Bokwa wagons were 5.5 to 6.5 metres long and 1.5 to 2 metres wide, and could carry loads of up to 4500 kilograms.[177] The record load was 8000 kilograms.[178] By the 1860s they commonly had iron axels. Initially, their main purpose was to freight large cargos between the coast and interior of present-day South Africa. Wagon transport had become increasingly commodified as new towns such as Graaf-Reinet, Bathurst, and Grahamstown had emerged after the 1820 settlers arrived, and some trekkers settled in the interior, and so requirements for supplies from the coast to the interior increased. Thus, transport wagon pulling was born.

[176] *Ibid*, 37.
[177] Burman, *Towards the Far Horizon*, 137–38.
[178] *Ibid*, 146.

Image 2.11. 'Bokwa' or transport wagon



Source: Burman, *Towards the Far Horizon*, 151.

Instead of spans of ten oxen, spans of 16 to 20 oxen were used, i.e., double spans of oxen. Usually, oxen were worked from 2 AM until an hour after sunrise, and from 4 PM until 10 PM, with grazing and rest permitted during the day.[179] Wagon labour was becoming more routinised, standardised, and commodified. Transport riders had to commit to cargo prices and time frames, and so oxen labour had to become more predictable. Initially there were two main transport routes: to Algoa Bay via Colesberg, Graaf-Reinet and Grahamstown, and to Durban, via Harrismith, the Drakensberg and Pietermaritzburg.[180] Oxen freighted serious volumes of cargo at this time.

[179] *Ibid*, 138.
[180] *Ibid*, 136.

Image 2.12. Nineteenth century transport wagon

Source: Burman, *Towards the Far Horizon*, 134.

During the three sheep shearing months in 1854, for example, 4000 wagons reportedly entered Port Elizabeth, and 2000 oxen-pulled wagons freighting other goods entered the town.[181] Assuming that ten oxen were employed per wagon implies that 60 000 oxen were employed in this one town in three months.[182] It was big business. In the mid-1850s transport costs between Grahamstown and Port Elizabeth were at £85 000 and those between Port Elizabeth and Graaf-Reinet were at £71 000.[183] In the 1850s there were routes from Lourenço Marques to the Transvaal and Durban to the Transvaal.[184] The route from Transvaal to Lourenço Marques, which involved a mix of porters and wagons, was by 1855 annually handling imports of 100 000 kilograms of lead and 2 500 kilograms of sugar, and exporting mealies, vegetables, hippopotamus teeth, and buffalo horns from the Transvaal.[185] Other

[181] J. Inggs, 'Liverpool of the Cape: Port Elizabeth Trade 1820-70', *South African Journal of Economic History* 1, 1 (1986), 96.
[182] This assumes that all the oxen who laboured over this period were different individuals.
[183] Inggs, 'Liverpool of the Cape', 97.
[184] Burman, *Towards the Far Horizon*, 143.
[185] *Ibid*, 136.

regional wagon routes included one from the Cape to Namaland in what later became Namibia.

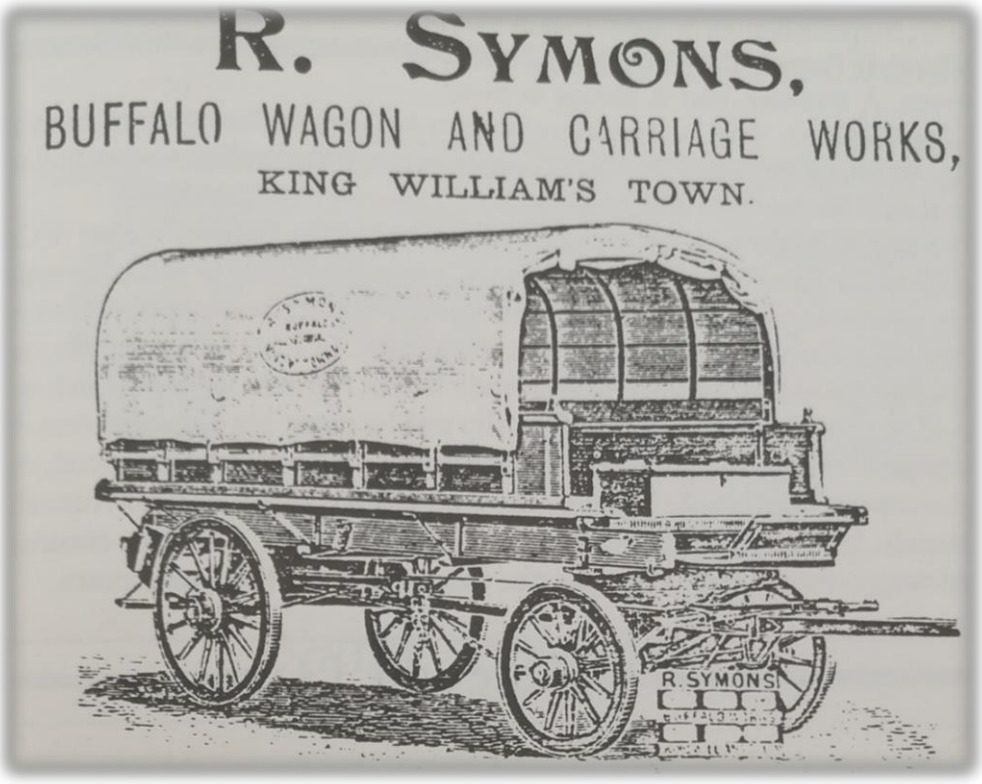
But oxen's transport wagon labours were significantly increased with the mineral rush in Kimberley and the Transvaal. The mineral rush was tremendously transformative for the region, as is well researched. One little recognised aspect is the extent to which it expanded oxen's wagon labours, and connected the region via wagon transport. In 1867 diamonds were discovered in Hopetown near the edge of the Great Karoo, gold was found in the Murchison range in the north-eastern Transvaal in 1870, and on the Witwatersrand in 1880, while its main reef was discovered in 1886.[186] Diamonds were discovered in Kimberley and the Orange Free State border in 1871. Regionally, during this time, demand for oxen labour boomed as never before. Wagon transport connected the mines to the major ports. The primary route which started to connect the Transvaal, Orange Free State, Northern Natal, and Northern Cape is still in place today.[187] In 1873 a colonial official remarked that: '[h]undreds of wagons enter Basutoland and traverse it in every direction… collecting and exporting the grain of the country to the Free State and the Diamond fields'.[188] In Basutoland, countless thousands of oxen pulled wagons for the next two decades.[189] In what became Botswana, the 'Road to the North', a wagon route that linked what became Botswana and South Africa, initially for trading elephants' ivory, ostriches' feathers, and guns, saw much-increased traffic in response to the mining boom.[190] Present-day Botswana was also connected to what became Zimbabwe by wagon routes. The first cargos that oxen pulled all the way from Delagoa in Portuguese East Africa reached the goldfields in February 1875.[191] Before the railways, all of the early heavy mining machinery was freighted by oxen. In the late 1870s, there were 2500 mules, oxen and horses working daily on the Kimberley, De Beers, Bultfontein and Dutoitspan mines, as compared to 350 steam engines.[192] In 1882 the four major diamond mines were using 500

[186] Mitchell, 'Setting the Scene: A Brief History of Transport Infrastructure in South Africa', 37.
[187] *Ibid*.
[188] T. Keegan, 'Trade, Accumulation and Impoverishment: Mercantile Capital and the Economic Transformation of Lesotho and the Conquered Territory, 1870-1920', *Journal of Southern African Studies* 12, 2 (1986), 200.
[189] *Ibid*, 200, 204, 207.
[190] B. Ntombingwenya, 'The Development of Transport Infrastructure in the Bechuanaland Protectorate 1885 - 1966', *Botswana Notes and Records* 16 (1984), 73.
[191] Silver and Co, *S. W Silver & Co's Handbook to South Africa*, 482.
[192] Noble, *History, Productions and Resources of the Cape of Good Hope*, 213.

wagon loads of firewood alone per week.[193] In the 1880s in the vicinity of 18 185 oxen pulled wagons and other vehicles entered the Kimberley market annually and about 20 468 went to the Dutoitspan and Bultfontein mines.[194] In the Cape the cattle population increased from 160 000 in 1855 to 405 000 in 1891.[195]

Wagon-building industries in the Cape and Natal boomed in the 1880s. In 1891, Paarl, Worcester, Oudtshoorn, Grahamstown, and King William's Town produced at least 3000 wagons and 4000 carts.[196]

Image 2.13. Transport wagon advertisement



Source: Burman, *Towards the Far Horizon*, 149.

[193] Pirie, 'Slaughter by Steam', 320.
[194] Noble, *History, Productions and Resources of the Cape of Good Hope*, 104.
[195] W. Beinart, 'Transhumance, Animal Diseases and Environment in the Cape, South Africa', *South African Historical Journal* 58, 1 (2007), 22.
[196] M. Wells, 'The Effect of the Wagon Building Industry on the Amatola Forests', *Bothalia* 11, 1 & 2 (1973), 153.

Meanwhile, in Natal, cargo transported by oxen and some horses by road between Pietermaritzburg and Durban between 1875 and 1881 amounted to 144 407 tons.[197] This was much lessened after the railway was built in 1880, although in 1885 some 5049 wagon licenses were issued in Natal.[198] In 1890 oxen in four towns in Natal pulled 27 698 wagons loads into the interior.[199] In the eastern Cape in the 1870s and 1880s, hundreds of local Africans worked as transport riders, implying thousands of oxen labourers.[200]

But oxen-pulled wagons were slow in comparison to railway trains and often expensive, and could not meet the requirements of the mineral boom that was transforming the region. Wagon transport largely ended in Basutoland in 1899 owing to first rinderpest and then the South African War.[201] Wagon labour was rapidly reduced in Natal after the Pietermaritzburg and Durban railway was built in 1880, and long-distance transport virtually ended by 1895, after the railway between Natal and the Transvaal was completed the year before.[202] In 1895 a railway from Lourenço Marques to the Transvaal was completed.[203]

Conclusion

Southern Africa was deeply interconnected via oxen labourers and their wagon routes in the late nineteenth century. Wagon routes connected the Cape to Bulawayo, Gaborone, and South West Africa. The Transvaal and Kimberley were connected to Portuguese East Africa. Basutoland was linked to the Transvaal, Free State and Natal. And Natal was linked to Zululand, Swaziland, and the Transvaal. The Transkei and eastern Cape were connected to the Transvaal and the Cape. All of these regional transport connections were mostly premised on oxen's wagon labour. Although unevenly and in differentiated ways, regionally, in the end it was the twin expansion of railway development and the rinderpest pandemic which largely

[197] D. Heydenrych, '"A Colony of Carriers": Transport-Riding in Nineteenth-Century Natal', *Kleio* 23, 1 (1991), 31.
[198] *Ibid*, 29.
[199] *Ibid*, 28.
[200] Pirie, 'Slaughter by Steam', 320.
[201] Keegan, 'Trade, Accumulation and Impoverishment', 211.
[202] Heydenrych, '"A Colony of Carriers": Transport-Riding in Nineteenth-Century Natal', 31; Pirie, 'Slaughter by Steam', 320.
[203] Burman, *Towards the Far Horizon*, 142.

ended oxen's stations as wagon labourers. In fact, it was oxen's labour as wagon pullers that enabled the spread of the terrible Lungsickness epidemic and the rinderpest pandemic in the nineteenth century – with the latter profoundly altering the course of cattle history in the region. The impacts of these diseases on cattle are the focus of the next chapter.

This chapter offered a lengthy treatment of colonial animal labour in southern Africa. The chapter drew on first-hand observers' accounts of oxen's wagon labours to approach the subjective aspect of oxen's labour contributions. It demonstrated that cattle were forced labourers, that they underpinned the regional transport routes into the late nineteenth century, that they enabled the initial stages of the mining boom, and that scientific explorations, missionary travel, the Great Trek, and local and regional trade was premised on oxen's labour. It argued that oxen deserve recognition in the region's labour history. The chapter argued that initial psychological breaking down of oxen was a necessary feature of wagon labour, as were whipping regimes and shouting, i.e., continued violence was used to maintain the oxen's wagon labour. It suggested that oxen faced serious, often lethal, hazards. Oxen were at times forced into situations by their masters where they starved to death, died from dehydration or collapsed from exhaustion. It argued that oxen plausibly experienced psychological and physical suffering from wagon labour. The chapter also showed that new markets, such as in Kimberley, and those associated with the 1820 settlers caused shifts in the mode of oxen's wagon labour. Further, oxen's wagon routes prefigured the main motor car road systems that started to connect the region in the twentieth century. The chapter positioned cattle, specifically oxen, at the centre of its analysis, conceiving of oxen as subjects – sentient, experiential beings – who felt and experienced wagon labour. The chapter also showed instances of oxen agency, such as when François Le Vaillant's oxen spared Klaas' life, or the manifold instances when oxen fled their station as wagon labourers, or lowed and bellowed at their lot. Principally, the chapter explored oxen's experiences of wagon labour, in terms of them being impacts of colonialism in the region.

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:

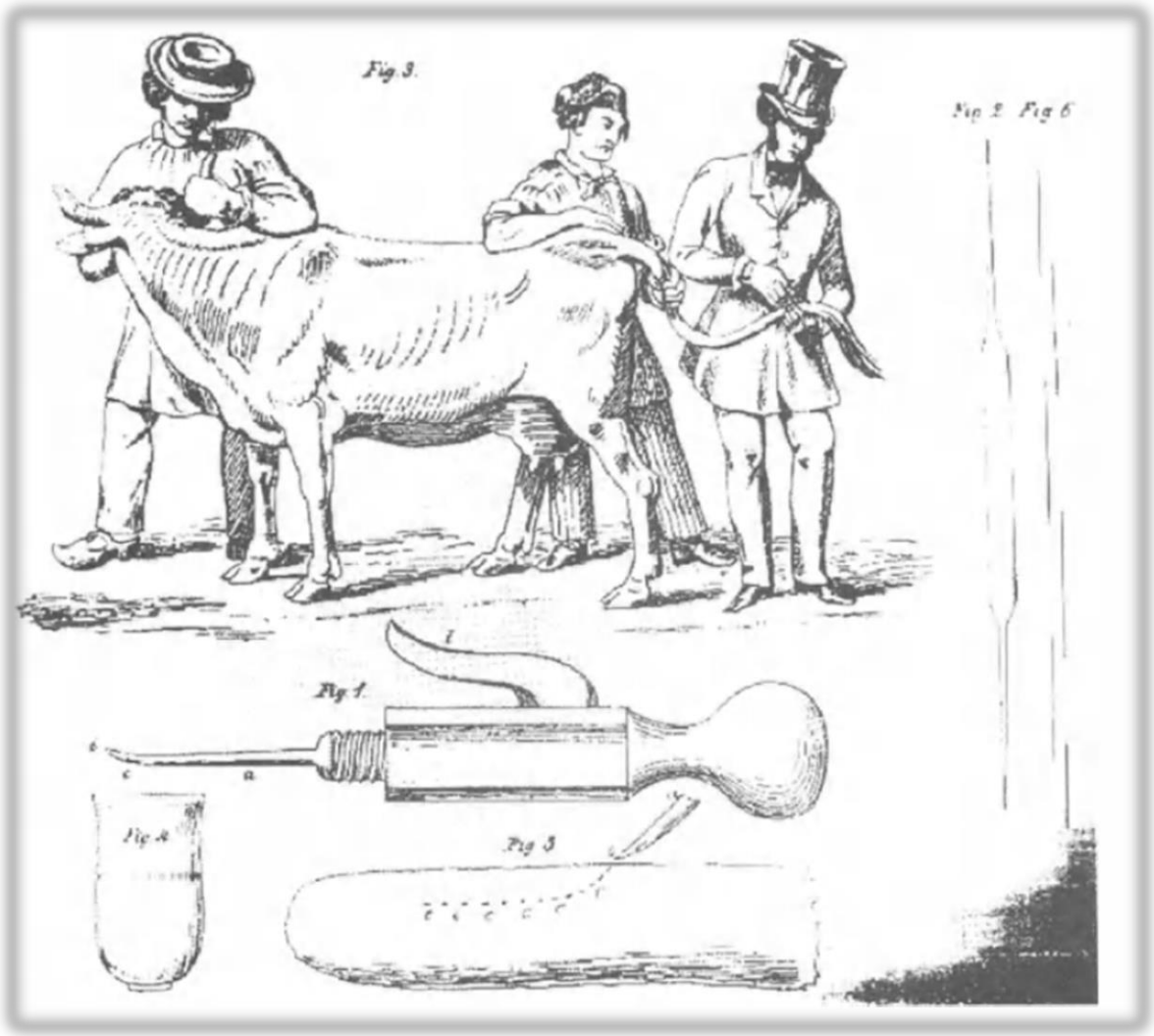
> The healthy cattle are vaccinated, with a lancet or pen knife, at the point of the tail with the humour of the lungs of one of the cattle afflicted with the disease, which is expressly killed for that purpose. After 10 … to 20 days, a strong swelling occurs, and after the lapse of about a month the 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.

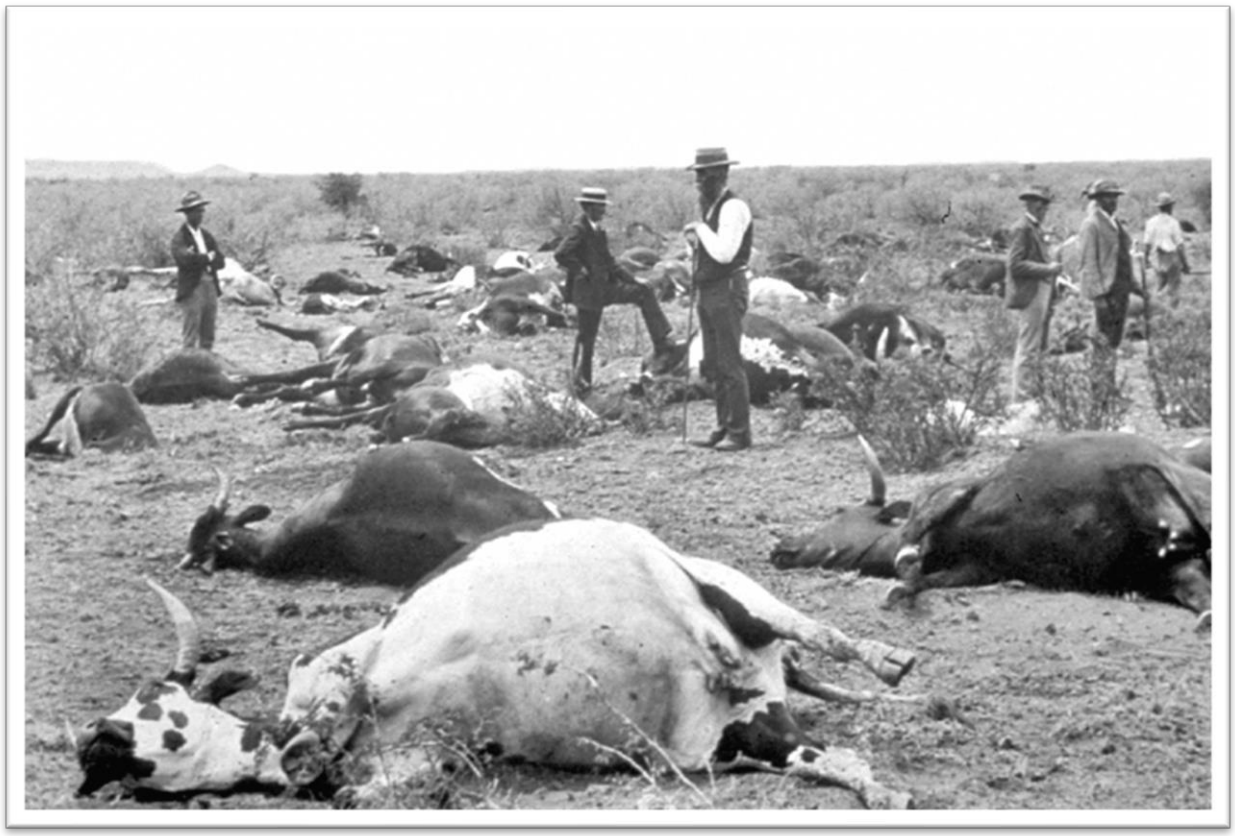
Political philosopher Kimberly Smith has argued that the expansion and consolidation of modern states was, in many ways, driven by increasing control over domesticated animals.[84] 'In general', she writes, 'domestic animals were well integrated into colonial social communities and a major concern of 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]

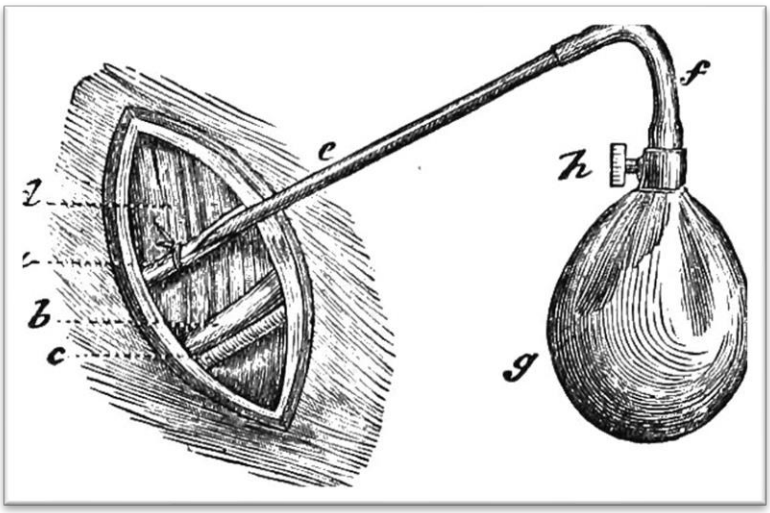
Common to the vaccines developed was the idea of infecting cattle with small doses of the rinderpest virus in blood or bile or a combination of both to develop an immune response against a weak version of the rinderpest virus. The idea was that an immune response could defeat a low viral load. The one 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



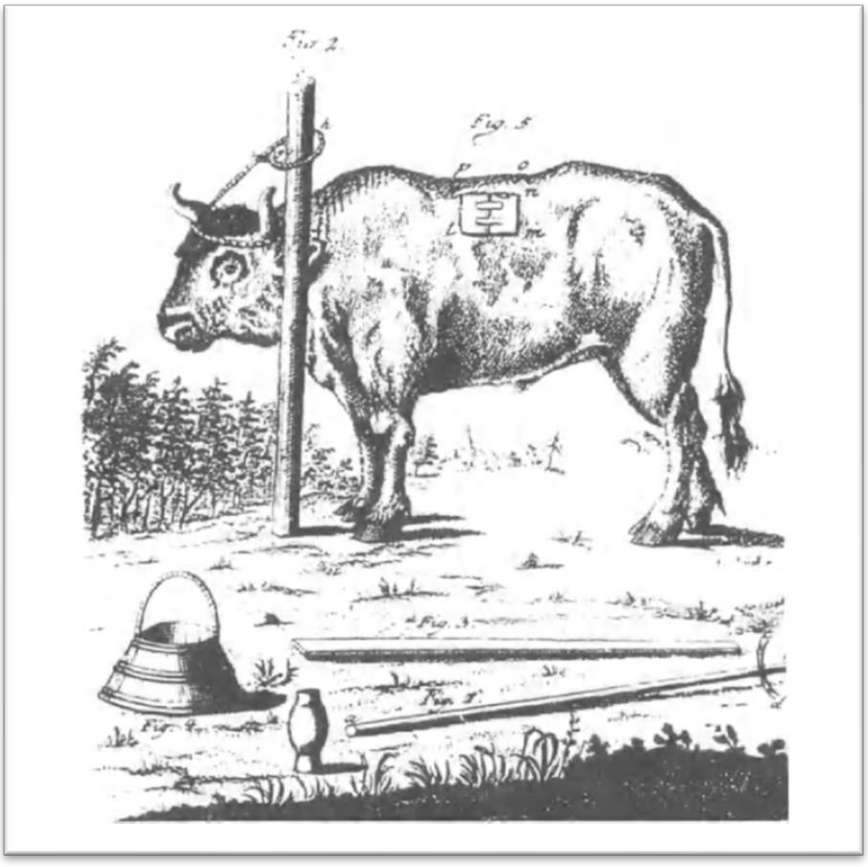
Source: R. Smith, *The Physiology of the Domestic Animals: A Text-Book for Veterinary and Medical Students and Practitioners* (London: F.A Davis, 1890), 276.

'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.

Chapter Four: A history of slaughterhouse development in the Cape, with reference to cattle's experiences, 1652–1935

Introduction

The previous chapter discussed the emergence of veterinary expertise and infrastructure in the region, as a response to disease epidemics, and also to monitor and maintain the productive health of cattle, in service of emerging capitalist cattle flesh markets. This chapter addresses another crucial aspect of capitalist cattle markets. It explores the development of slaughterhouses as an impact of colonialism in southern Africa. It focuses on the Cape Colony as a case study, although developments in South Africa and the region at times contextualise the focus on the Cape. It traces the development of the Cape's first slaughterhouse, set up by the VOC in the late seventeenth century, through to the emergence of industrialised slaughterhouses in South Africa and the southern African region in the early twentieth century. Slaughterhouses were core, necessary institutions in the development of capitalist animal flesh markets. The chapter investigates two primary questions. What led to the development of industrial slaughterhouses in the Cape Colony? And, how did the development of slaughterhouses impact the experiences of cattle?

Approximating a bovine perspective, this chapter argues that the development of animal flesh markets and slaughterhouses were transformative impacts of colonialism in southern Africa. It aims to explore how industrial slaughterhouses impacted cattle's experiences. The chapter focuses on three impacts of colonialism which contributed to the early twentieth century development of industrialised, mass animal slaughter. The first was the VOC's creation of an animal flesh market from the mid-seventeenth century, which connected cattle and sheep to global capitalist markets, stimulated a demand for cattle breeding, and facilitated the beginning of settler colonialism in the Cape. The second factor was the British army's large war contracts to supply its troops with cattle flesh during the South African War, and which provided a major financial stimulus to the flesh production monopolies. Third, the vast market for animal flesh created by the mining industry's compound contracts, in the context of the mining boom, hastened the development of industrial slaughterhouses. Industrial, state-run slaughterhouses occurred in the context of new refrigerated transport technologies, and early state-building processes in what became South Africa. The chapter endeavours to investigate how slaughterhouses impacted cattle's experiences, to enter historical slaughterhouses, and describe what they were like for cattle.

Diverse evidence is invoked to explore slaughterhouse development in the Cape. The period from 1652 to the late nineteenth century draws on secondary literature, two doctoral theses on the VOC period, VOC records, Jan van Riebeeck's journal, zooarchaeological evidence, travellers' accounts, newspapers, archival material, a court case, and a contemporary recipe book. Owing to a paucity of secondary material about slaughterhouse development in the Cape and South Africa, evidence for the early twentieth century until the 1930s draws extensively on previously unused archival materials. These materials include SPCA and *Die Burger* journalist investigations into slaughterhouses, newspaper articles, voluminous Cape's Joint Slaughterhouses Committee meetings' minutes, correspondence, government reports, and architectural designs of various slaughterhouses designed for the Cape in the early twentieth century.

There is almost no secondary literature on the development of slaughterhouses in South and southern Africa, and certainly none which investigate animals' experiences of them. Philidia Simon's *Ice Cold in Africa: The History of the Imperial Cold Storage & Supply Company Limited* (2000), is an industry-endorsed history, that pays much attention to individual men, and which can at times read as semi-hagiographic.[1] It is uninterested in slaughterhouses *per se* but is full of references to archival material and offers a detailed history of Imperial Cold Storage, the region's major animal flesh production monopoly. Eric Rosenthal's unpublished *Cold Storage Chronicle: History of the Imperial Cold Storage* (circa 1955), the sole known copy of which is housed at Cambridge University Library's Rare Books Department, makes for useful background reading and notes key developments in the emergence of Imperial Cold Storage.[2] Although historians of the region have not been interested in animals' experiences of slaughterhouses, as this chapter shows, concerns about animals' welfare and experiences were discussed and debated in parliament, members of the public wrote to newspapers, and animal welfare concerns were even engaged by the Secretary of Agriculture, and various health and veterinary officials in the early twentieth century. Patrons of the Animal Welfare

[1] P. Simons, *Ice Cold in Africa: The History of the Imperial Cold Storage & Supply Company Limited* (Cape Town: Fernwood Press, 2000).
[2] Cambridge University Library, Rare Books Department, E. Rosenthal, 'Cold Storage Chronicle: History of the Imperial Cold Storage' (Unpublished: circa 1955).

Society of South Africa (AWSSA), which lobbied for laws regulating animal slaughter from the late 1920s, for example included the Mayor of Cape Town and leaders of important religious groups, like the Dutch Reformed Church.

More broadly, Amy Fitzgerald's social history of slaughterhouses focuses on the broad history of slaughterhouses as modern institutions in the United States and Western Europe. It traces the shift from private to public slaughterhouses, explores the industrialisation of animal slaughter, and discusses the contemporary social impacts of slaughterhouses on workers, the environment, and rural communities.[3] Chris Otter's detailed study of the development of British public slaughterhouses from the mid-nineteenth to the early twentieth century explores how changing attitudes towards animal slaughter saw public slaughterhouses 'banished to the perimeter[s] of the cit[ies]'.[4] Animal slaughter went through a 'civilising process' by removing slaughter from public experiences. He observes that killing and eating animals is 'one of the most conservative rituals in Western cultures'.[5] Drawing on Norbert Elias's *The Civilizing Process: Sociogenetic and Psychogenetic Investigations* (1939), he argued that 'civilisation develops by consuming more meat but devoting more effort to effacing the gory evidence of its production'.[6] As this chapter suggests, this form of civilisation was enacted in South Africa under British colonisation, particularly from the late nineteenth century.

Various scholarship has investigated the development of the Union Stockyards of Chicago, which exemplified the emergence of industrial slaughter, including William Cronon's *Nature's Metropolis: Chicago and the Great West* (1991) and Rudolf Clemen's *The American Livestock and Meat Industry* (1923).[7] In Joshua Specht's *Red Meat Republic: a Hoof-to-Table History of*

[3] A. Fitzgerald, 'A Social History of the Slaughterhouse: From Inception to Contemporary Implications', *Human Ecology Review* 17, 1 (2010), 58–61, 63–66.
[4] C. Otter, 'Civilizing Slaughter: The Development of the British Public Abattoir, 1850-1910', *Food and History* 3, 2 (2005), 39.
[5] *Ibid*, 48.
[6] *Ibid*; N Elias, translated by E. Jephcott, *The Civilizing Process: Sociogenetic and Psychogenetic Investigations* (Malden: Wiley-Blackwell, 2000).
[7] W. Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton & Company, 1991); R. Clemen, *The American Livestock and Meat Industry* (New York: Ronald Press, 1923); J. Skaggs, *Prime Cut: Livestock Raising and Meatpacking in the United States, 1607-1983* (College Station: Texas A&M University Press, 1986); R. Horowitz, *Putting Meat on the American Table: Taste, Technology, Transformation* (Baltimore: Johns Hopkins University Press, 2006).

how Beef Changed America (2019), he notes that previous studies of the Chicago Stockyards have focused on the supply of cattle, the development of railroads, refrigeration, and important men.[8] What he calls the 'great-man narrative' has been dropped in more recent histories but technology and 'organisational changes', he argues, have remained core features of the narratives.[9] He notes that previous 'accounts present the modern food production system as an inevitable result of technological change and business optimization rather than one aggregate outcome of many social and political struggles.'[10]

With some hyperbole, he argues that a 'complete picture of the rise of centralized meatpacking must portray human conflict alongside technological changes and business developments'.[11] His own approach is to place 'people and social conflict at [the] center.'[12] He regards 'the animal's perspective' as a distraction from concerns about the roles and contributions of labourers.[13] In contrast to Joshua's Specht's approach, this chapter aims to foreground what slaughterhouse developments in South Africa, specifically in the Cape, meant for the cattle themselves, and how slaughterhouses affected cattle's lives and experiences.

Upton Sinclair's influential novel *The Jungle* (1906), while not directly approximating animals' perspectives, contains some vivid and affecting descriptions of what the Chicago Stockyards were like for animals.[14] J. M. Coetzee's novel *Elizabeth Costello* (2004) and a short story 'The Glass Abattoir' treats the subject of industrial animal slaughter from the perspective of Elizabeth Costello, a protagonist who contemplates the moral and psychological crisis that industrial slaughter presents.[15] In an interview about the short story, J.M. Coetzee has said:

[8] J. Specht, *Red Meat Republic: A Hoof-to-Table History of How Beef Changed America* (Princeton: Princeton University Press, 2019), 177.
[9] *Ibid*.
[10] *Ibid*.
[11] *Ibid*.
[12] *Ibid*, 3.
[13] *Ibid*, 184.
[14] U. Sinclair, *The Jungle, Webster's Thesaurus Edition* (San Diego: ICON Books, 2005), 38–47 72–73.
[15] J. M. Coetzee, *Elizabeth Costello* (London: Vintage Books, 2004); J. Malec, 'JM Coetzee Reads a New Story, "The Glass Abattoir", and Announces a New Book to Feature Elizabeth Costello', *The Johannesburg Review of Books*, 25 September 2017.

> The question you ask is, why a story about factory farming, why not a lecture about factory farming? And the answer is, I think, that 'The Glass Abattoir' is not about factory farming or about vivisection so much as it is about the state of mind of someone to whom these questions matter very deeply.[16]

The most notable attempt to enter a modern slaughterhouse is Timothy Pachirat's *Every Twelve Seconds: Industrialised Slaughter and the Politics of Sight* (2011).[17] His ethnographic research involved spending over five months as an employee at a mega industrial slaughterhouse in Nebraska. The slaughterhouse killed over 2 400 cattle daily, or one every twelve seconds. The book is narrative-driven, and includes intricate details of the various jobs he performs, as well as the layout of the slaughterhouse. One core argument is that the modern slaughterhouse is carefully compartmentalised so that myriad labour roles mostly block workers from having an overall view of the enterprise. Of the over 800 workers employed there, only seven had contact with live animals, a mere four workers were directly involved in killing animals, while 770 workers had no visuals of the slaughter process whatsoever.[18] The external walls of the slaughterhouse block the public from seeing in, but many interior 'physical, linguistic, and phenomenological walls', writes Timothy Pachirat, 'often feel every bit as rigid as those marking off the exterior of the slaughterhouse from the outside world'.[19] His book was an attempt to give sight to the internal workings of modern slaughterhouses. In the southern African historiography, the historical impact of slaughterhouses on cattle's experiences remains unacknowledged and unarticulated. My approach is to draw on available historical materials, such as architectural designs of slaughterhouses and SPCA investigations, and to interpret these sources in light of an interdisciplinary understanding of cattle's experiential capacities. Via this approach, inferences about cattle's likely experiences of slaughterhouses are drawn.

Chronologically, the chapter starts with the VOC's arrival in 1652; after which cattle were connected via the VOC to global capitalist markets. It discusses an early formalised VOC animal flesh market set up near the Cape harbour in 1665, and the appearance of a VOC

[16] Malec, 'JM Coetzee Reads a New Story', 2017.
[17] T. Pachirat, *Every Twelve Seconds: Industrialized Slaughter and the Politics of Sight* (New Haven: Yale University Press, 2011).
[18] *Ibid*, 62.
[19] *Ibid*, 236.

slaughterhouse, the Shambles, from at least 1698. It discusses the expansion of the VOC's processes for provisioning ships and the local market for animal flesh over the eighteenth century. It then discusses changes in the regulation of animal slaughter under British colonialism in the Cape from the early nineteenth century, and increasing public dissatisfaction over the sights, smells, and sounds emanating from the Shambles. An 1883 court case, which later led to the closure of the Shambles, is investigated to draw inferences about cattle's likely experiences of the slaughterhouse. The late nineteenth century marked the period when dramatic, rapid changes in the development of slaughterhouse unfolded. In the context of new refrigerated transport technologies, David Graaf's animal flesh monopoly was established. A shift from private to public slaughterhouses, underpinned by health regulations, also started to occur. At this juncture two of the major causative factors in the emergence of industrialised slaughterhouses come into focus. These are the British army's contract to supply its troops with animal flesh during the South African War, and the mining industry's compound contracts, which involved supplying mineworkers with daily animal flesh rations. Both factors saw huge quantities of capital injected into the extant animal flesh industries. In 1902 a mega, heavily capitalised animal flesh monopoly, Imperial Cold Storage and Supply Company Limited, emerged when the mining industry's major animal flesh firms joined forces with David Graaf's monopolistic cold storage firms. The early twentieth century saw shifts to industrialised, state-run slaughterhouses, which were established in Johannesburg (1910), and Cape Town (1914). The chapter then notes the proliferation of industrial slaughterhouses in the Cape province and the emergence of slaughterhouses in South Africa and the region. It includes a discussion of cattle's experiences of industrialised slaughterhouses in the early twentieth century. The chapter closes by discussing the enactment of South Africa's first significant animal welfare law (1934), which aimed to improve animals' experiences of mass slaughter. This chapter argues that the development of slaughterhouses was a wide-reaching, transformative impact of colonialism, with extensive consequences for cattle.

Precursors to industrialisation: the VOC, the Shambles, and health disputes in the Cape, 1652–1890s

The Cape of Good Hope, at the southern tip of Africa, marked something of a halfway point for merchant ships travelling to and from Europe and the East. Thus, in the mid-seventeenth century the Cape of Good Hope was of major strategic interest to the VOC and other merchant shipping groups. Landing in 1652, Jan van Riebeeck's mandate was to set up a station to provision Dutch East India Company VOC merchants *en route* to the East. By provisions the VOC meant fresh water and vegetables, and sheep and cattle flesh. 1652 thus marked the start of major transformations for southern African cattle. We saw in Chapter Two that from 1653 the VOC forced oxen to perform wagon labour for them. The other major impact for cattle was that the VOC set up a market to sell cattle and other animals' flesh to ships and merchants. The VOC connected southern African cattle to global capitalist markets. Because the Dutch set up animal flesh production in the Cape, the development of slaughterhouses in what became South Africa had its origins in the VOC's animal flesh trade. For this reason, this chapter starts its analysis from 1652. Previous chapters have been chronologically connected to each other. This chapter jumps back to the start of colonialism at the Cape to indicate the beginnings of animal flesh production at the Cape.

Jan van Riebeeck's journals show a lively, obsessive concern to accumulate and breed cattle. In December of 1652, his journal records that:

> To-day we had ample opportunity of depriving them [Saldaniers] of 10 000 head cattle had we been allowed to do so. If we are ordered to do this, it can always be done at some future date… Once we had possession of so many cattle, we could maintain an adequate supply by breeding.[20]

For cattle a new human tribe had arrived, the VOC and accompanying settlers, backed by a pioneering mercantile empire's transnational limited liability corporation, with a strong partiality towards capturing and breeding them, forcing them to pull wagons and ploughs, and regularly slaughtering and eating them. The VOC brought with them a culture and

[20] J. van Riebeeck, translated by H. Thom, *Journal of Jan Van Riebeeck Volume 1, 1651-1655* (Cape Town: A. A Balkema, 1952), 112.

economics premised on frequent, normalised cattle flesh eating. The Khoikhoi who lived in and around the Cape in the seventeenth and eighteenth centuries were transhumant pastoralists who used the milk of cattle and sheep as well as their hides and wool, but slaughtering and eating cattle was reserved for special ceremonial events.[21] Based on his observations at the Cape in the early eighteenth century, Peter Kolben said of the Khoikhoi's views on eating cattle:

> The victuals of the Hottentots are the Flesh and Entrails of Cattle and of certain Wild Beasts, with Fruits and Roots of several Kinds. But setting aside the Sacrifices, which are indispensable, at Births, Legitimations, Marriages, and other Andersmakens, *the Hottentots, rarely kill Cattle for their own Eating but when they are at a Loss for other Sustenance.* The Cattle they devour between the Andersmakens, are, for the most Part, such as die naturally.[22]

Andermakens translates to change-making; *maak anders*, change to something else. The term referred to special ceremonies or rituals, including marriages, initiation, driving out malevolent spirits, or curing disease.[23]

Also based on his observations in the Cape, between 1733 and 1741, Otto Mentzel concurred that the Khoikhoi only rarely ate cattle flesh.

> Should an animal die, be it a beast or a sheep, it is cut up and eaten, but they never slaughter any, except for some festival or "different-making" [*andersmaken*]. When a member of their family falls ill, they generally cut off a sheep's tail, melt out the fat, anoint themselves or the sick person with it, and pick off the meat. To spare their cattle they frequently go hunting. If they are so fortunate as to stalk and kill an elephant, rhinoceros, buffalo, eland or other game, not only the whole family but the entire village have their fill.[24]

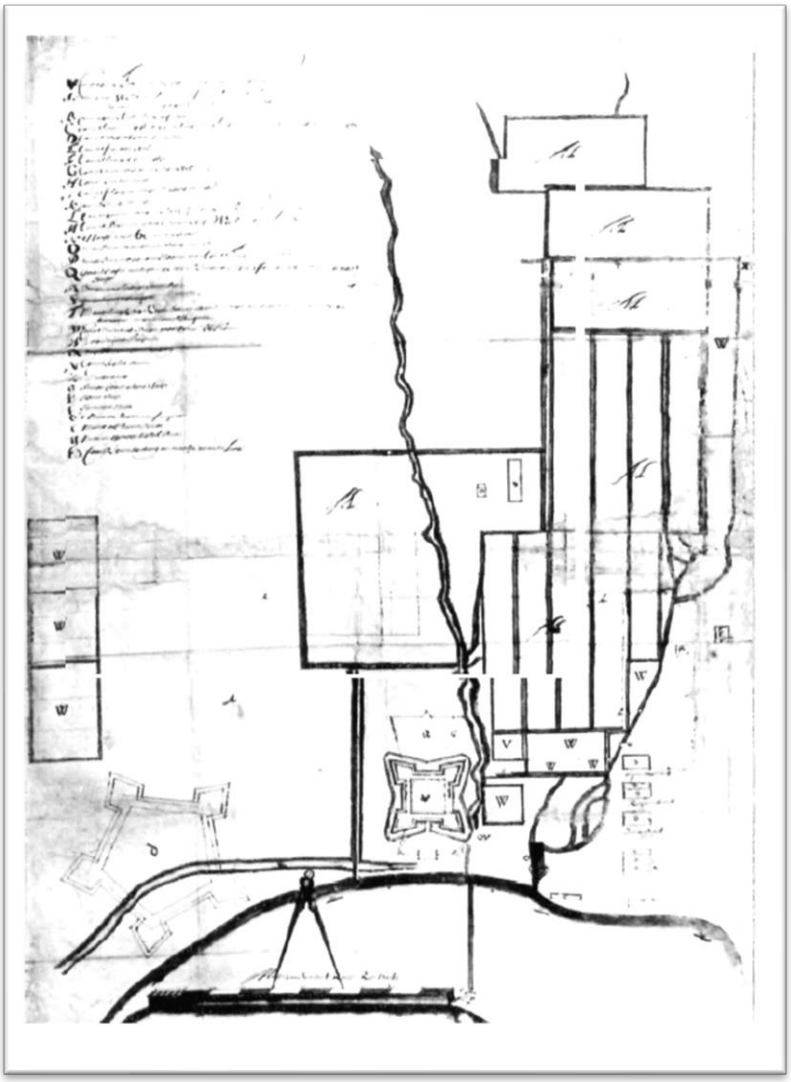
[21] E. Boonzaier *et al*., *The Cape Herders: A History of the Khoikhoi of Southern Africa* (Cape Town: David Philip, 1996), 46.
[22] P. Kolben, translated by Mr Medley, *Present State of the Cape of Good-Hope* (London: W. Innys, 1731 [1719]), 200, emphasis added.
[23] J. M. Coetzee, 'Idleness in South Africa', *Social Dynamics* 8, 1 (1982), 2; O. Mentzel, translated by G. Marais and J. Hoge, *A Geographical and Topographical Description of the Cape of Good Hope* (Cape Town: The Van Riebeeck Society 1944 [1787]), 281, 288.
[24] Mentzel, *A Geographical and Topographical Description of the Cape of Good Hope*, 292.

Thus, whereas the Khoikhoi infrequently ate cattle flesh, the VOC brought to the Cape the human social and cultural practice of regularly killing, eating and selling domesticated animals. At least fourteen years after Jan Van Riebeeck's arrival a formal market was set up at the Table Bay harbour, located alongside the beach, near to where merchant ships berthed. The German merchant Zacharias Wagenaer in 1665 mentioned that a shed constructed the previous year had been repurposed as a bazar or market – 'een bezer off marckplaets' - where fresh animal flesh, fish, and vegetables were sold.[25] By 6 August 1665 Dutch settlers were encouraged to bring cattle and sheep carcasses on Saturdays to be sold by the VOC's butcher.[26] The 'nieuwen Marcktplaats', new market, was mentioned again on 22 August when produce prices were listed.[27] The animal produce sold at the market included the flesh of cattle, sheep, pigs, wild boars, various types of African antelopes including elands, steenboks, and hartebeests, rabbits, fish, hippopotamuses and rhinoceroses.[28]

The marketplace was first depicted in a map of the town in 1665.[29] See the long rectangular building alongside the beach, image 4.1, and compare to building 'G' in image 4.2.

[25] A. Boeseken, *Dagregister en Briewe van Zacharias Wagenaer, 1662 – 1666* (Pretoria: Staatsdrukker, 1973), 352; Cited in R. Fitchett, 'Early Architecture at the Cape under the VOC (1652-1710): The Characteristics and Influence of the Proto-Cape Dutch Period' (PhD Dissertation, University of the Witwatersrand, Johannesburg, 1996), 254, 733.
[26] Boeseken, *Dagregister en Briewe van Zacharias Wagenaer, 1662 – 1666*, 209–10; Cited in Fitchett, 'Early Architecture at the Cape under the VOC', 254, 733.
[27] M. Jeffreys, *Kaapse Plakkaatboek. Deel I (1652-1707)* (Cape Town: Cape Times Limited, 1944), 87–90; Cited in Fitchett, 'Early Architecture at the Cape under the VOC', 254, 733.
[28] Jeffreys, *Kaapse Plakkaatboek. Deel I (1652-1707)*, 88–89.
[29] Fitchett, 'Early Architecture at the Cape under the VOC' 254, 910.

Image 4.1. Plan of the Castle, fort and nascent town circa 1665

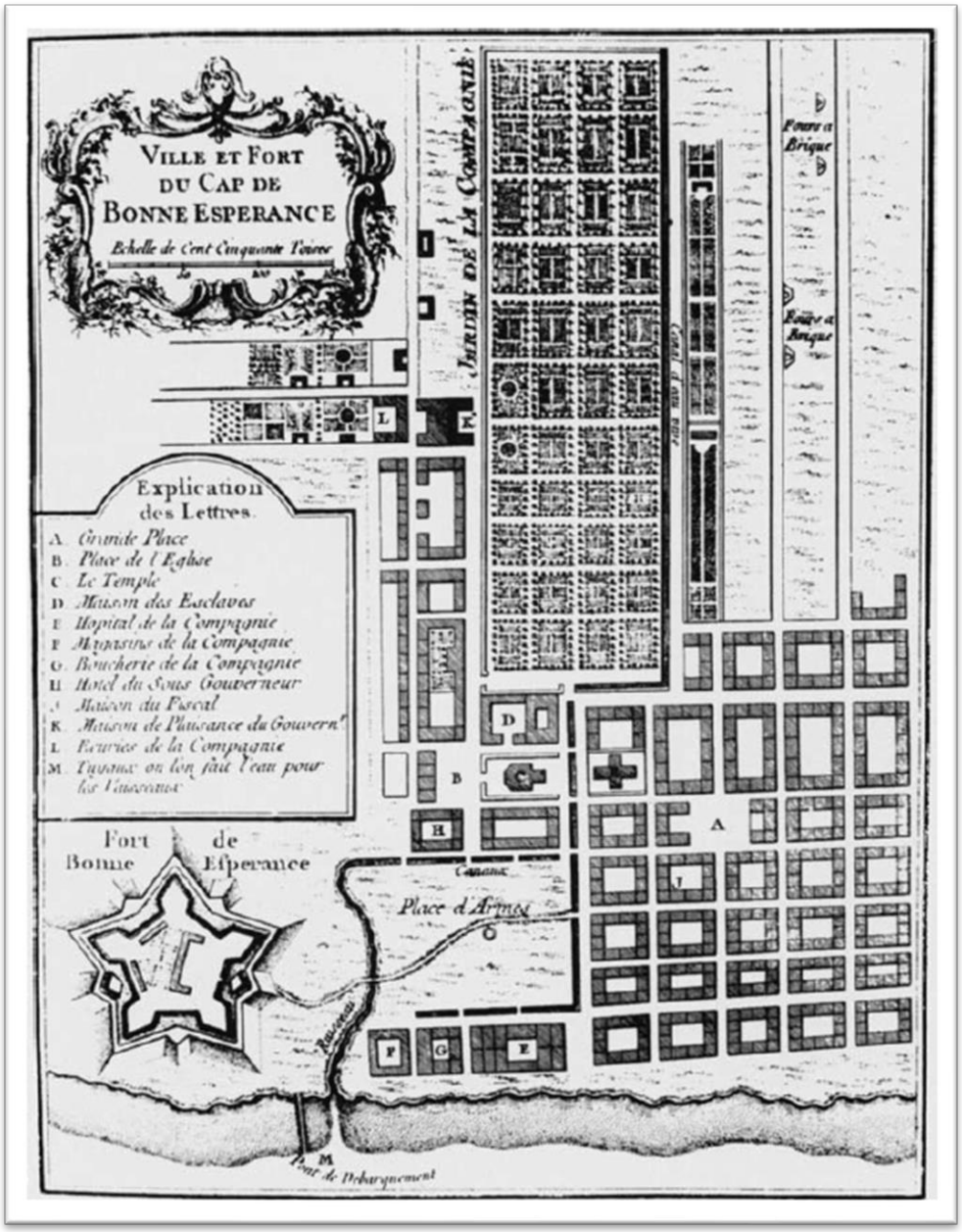


Source: R. Fitchett, 'Early Architecture at the Cape under the VOC (1652-1710): The Characteristics and Influence of the Proto-Cape Dutch Period' (PhD Dissertation, University of the Witwatersrand, Johannesburg, 1996), 254, 910.

According to Martin Hall, the 'new' Castle, depicted above and below, was built from 1666.[30] For reference, a clearer map from 1764 depicts the butchery near the castle at building 'G'.

[30] M. Hall, *Archaeology and the Modern World: Colonial Transcripts in South Africa and Chesapeake* (London: Routledge, 2000), 61.

Image 4.2. 1764 map of Cape settlement, with butchery shown at block 'G'



Source: M. Hall, *Archaeology and the Modern World: Colonial Transcripts in South Africa and Chesapeake* (Routledge: London, 2000), 28.

By 1686 a new 'vleeshuijs' or butcher's hall had been built near the waterfront and jetty, paid for by the VOC and the burghers.[31]

[31] Fitchett, 'Early Architecture at the Cape under the VOC', 255, 733.

It is not entirely clear when the flesh market at the harbour first became a slaughterhouse. From 1665 there was a market that sold animal flesh but it is not clear that it was yet a slaughterhouse. The 1686 reference to the 'vleeshuijs' suggests that between 1665 and 1686 the market may have morphed into having a slaughter function. The 'shambles' is mentioned in VOC correspondence from 1698.[32] In 1698, Simon van der Stel, the VOC's commander at the Cape Colony, wrote to the Seventeen at Amsterdam, noting that:

> In order to make better provision for the supply of the ships and the hospital, and prevent all abuses and irregularities which have taken place without our knowledge and in spite of our care, new regulations have been framed for the shambles after careful consideration. The shambles will henceforth be under the supervision of two sworn commissioners, and the butcher will also be sworn.[33]

This shows that the VOC imposed some form of regulations on animal slaughter, and that at least by 1698 there was a definitive slaughterhouse, the 'shambles'.[34] Zooarchaeological evidence, discussed below, suggests that by at least 1691 butchery occurred within the Castle, and from at least 1720 animals were slaughtered near the castle, and that their bones were thrown into the Moat. In 1700 the VOC commissioned an upgraded slaughterhouse, this time with a kraal for receiving cattle and sheep, the construction of which was completed by 14 March 1701.[35] This suggests that by the eighteenth century, the VOC had set up a mass flesh production system. By 1706 the shambles were referred to as 'the Company's slaughterhouse and kraal'.[36]

From 1700 settlers began moving over the Berg River towards Tulbagh, over 100 kilometres from Cape Town, and in 1714 the VOC issued grazing rights to 6 000-acre farms in exchange for yearly rent.[37] We saw in Chapter Two that via trade, raiding, and theft colonial settlers by 1710 had acquired over 20 000 cattle and 130 000 sheep, meaning that they needed more

[32] H. Leibbrandt, *Precis of the Archives of the Cape of Good Hope. Letters Despatched, 1696-1708* (Cape Town: W. A Richards & Sons, 1896), 67.
[33] *Ibid*.
[34] *Ibid*, 10, 141, 156, 282. The VOC had already in 1696 contracted a designated butcher, Henning Huysing, to slaughter and butcher animals for sale to the company and settlers. Henning Huysing was again contracted as the VOC butcher and slaughterer between 1701 and 1705.
[35] Leibrandt, *Precis of the Archives*, 170, 217, 282.
[36] *Ibid*, 282.
[37] M. Adhikari, 'A Total Extinction Confidently Hoped for: The Destruction of Cape San Society under Dutch Colonial Rule, 1700-1795', *Journal of Genocide Research* 12, 1/2 (2010), 23, 26.

pasturage and water for their herds and flocks, and thus that they moved further into the Cape.

The genocidal clash between San versus the settler trekboers (migrant farmers) and commandos, for example, was one explained broadly by the contact between hunter gatherer and farming communities. The primary competition revolved around access to resources including water, grazing, land and control of cattle and sheep, more specifically explains the Dutch genocide of San foragers.[38] Cape Town provided a significant market for cattle, sheep, and wild mammal flesh throughout the eighteenth century. This market in turn created market-orientated cattle and sheep farming settlers.[39] Cattle were cut into pieces and their bodies, salted and preserved, or sold as fresh, became increasingly linked to global capitalist markets.

Jan van Riebeeck initially thought he could supply eight sheep and eight cattle to each ship.[40] While van Riebeeck was in power, between 1652 and 1662, there were about 40 ships each year. But by the late 1680s, the ships berthing at the Table Bay were buying around 2 000 sheep and over 300 cattle per annum, a ratio of approximately seven sheep to one cattle, and ships were receiving around 30 to 100 sheep each.[41] Sex and dentition indicators show that by the 1720s the VOC had a breeding regime set up, in that sheep were slaughtered at 'prime' ages, i.e., not when they were young and could grow larger yet.[42] Before this time, the VOC was unable to meet ships' demands for animal flesh. After 1700, trekboers – an admixture of Dutch and French Huguenot settlers, Asians, and Africans – moved further into the interior of the Cape, sometimes traded and often pillaged cattle and sheep from the Khoikhoi. These latter human societies, premised upon holding cattle as a form of wealth, were largely destroyed by trekboer conquests. Near the end of the seventeenth century there were around sixty-five ships each year and by the 1720s around eighty-five ships were provided

[38] *Ibid*, 27.
[39] *Ibid*, 20.
[40] A. Heinrich, 'Historical Zooarchaeology of Colonialism, Mercantilism, and Indigenous Dispossession: The Dutch East India Company's Meat Industry at the Cape of Good Hope, South Africa', in U. Albarella *et al*. (eds.), *The Oxford Handbook of Zooarchaeology* (Oxford: Oxford University Press, 2017), 481.
[41] *Ibid*, 486.
[42] *Ibid*.

with cattle and sheep flesh.[43] The VOC desired a total of over 175 000 kilograms of sheep and cattle flesh for ships annually by the 1730s.[44]

Zooarchaeological research corroborates contemporary observations that the VOC and those in its employ butchered cattle and sheep in the late seventeenth and early eighteenth century.[45] Adam Heinrich's zooarchaeological analysis of faunal sites in the Cape offers striking insight into the VOC's animal flesh industry during the seventeenth and eighteenth centuries. Two sites at the Castle of Good Hope, near the Table Bay shore, bear especial relevance. These are the infilled Moat, covering the period 1720 to 1725, and the Granary. The Moat was meters away from where cattle and sheep were slaughtered for the shipping market. The Granary was located within the VOC's castle, and the excavations cover the period 1666, when the new VOC castle was built, to 1691, and from the mid-eighteenth century.[46] The Moat and Granary sites supply zooarchaeological evidence of an animal flesh industry set up by the VOC in which animals were slaughtered *en masse* for ships and the local settler and military markets from the mid-seventeenth to the mid-eighteenth century.[47]

In the early eighteenth century, 1720 to 1725, sheep outnumbered cattle in these sites in minimum number of individuals ratios of approximately 10 to 1, and 14 to 1.[48] The faunal remains show explicit signs of 'provisioning', i.e., that sheep and cattle were slaughtered as part of an animal flesh industry. At the Moat, skulls are strongly represented while vertebral and appendicular bone structures are absent. In other words, mostly sheep skulls were found but not their skeletons, which indicates that 'primary butchery', cutting off sheep's heads was conducted at the Moat near the shore. There is very little evidence of cooking in the faunal remains, such as charred bones, at the Moat samples, which is evidence of a type of

[43] *Ibid*.
[44] *Ibid*, 481.
[45] A. Heinrich, 'A Zooarchaeological Investigation into the Meat Industry Established at the Cape of Good Hope by the Dutch East India Company in the Seventeenth and Eighteenth Centuries' (PhD Dissertation, The State University of New Jersey, New Jersey, 2010) This thesis comprises the most detailed analysis of the emergence of the VOC's animal flesh production system at the Cape in the seventeenth and eighteenth centuries.
[46] Heinrich, 'Historical Zooarchaeology of Colonialism', 481.
[47] A. Heinrich and C. Schrire, 'Faunal Analysis and the Development of the Meat Industry at the VOC Cape in the 17th and 18th Centuries.', in C. Schrire (ed.), *Historical Archaeology in South Africa: Material Culture of the Dutch East India Company at the Cape* (California: Left Coast Press, 2014), 65; Heinrich, 'Historical Zooarchaeology of Colonialism', 482.
[48] Heinrich, 'Historical Zooarchaeology of Colonialism', 482.

slaughterhouse. Chopping at the Moat was to partition the animals into large units, rather than small pieces that could fit into pots, roasting pans, or be skewered manageably on spits. By strong contrast, the faunal samples from inside the Castle, the Granary, show clear 'kitchen signature[s]'.[49]

For sheep and cattle, the impact of colonialism was rapid and dramatic. Thirteen years after the VOC arrived, they had set up a permanent market, which sold cattle and sheep and other animals' flesh to locals, the military, and merchant ships. The VOC connected cattle to global capitalist markets. Faunal remains show that secondary butchery began from at least 1666. From the mid-seventeenth century onwards, cattle flesh would increasingly become a commodity in southern Africa.

In 1753 the earlier harbour slaughterhouse had been renovated and was more commonly called 'De Slagpaal', in Dutch, or 'The Shambles', in English.[50] Located near the Fresh River and the beach, the idea, as before, was that offal could be buried beneath the beach sand, or washed away at high tide, and the river could be employed to wash away the blood.[51] The Shambles was a row of thatched-roof shops, behind which were crude fence enclosures, or mini kraals, where sheep and cattle were driven to and incarcerated before slaughter.[52] Animals were slaughtered at all hours of the night and day, and the cries of animals could be heard by passers-by.[53] During the late eighteenth century the VOC controlled about half of the animal flesh trade in the Cape.[54] The rest was largely controlled by farmers. Describing the process of acquiring sheep for slaughter in the Cape in 1775, Anders Sparrman wrote:

> the butcher's men go about, buying them up, and afterwards drive them in flocks, consisting of several hundreds, and sometimes even thousands, to the slaughterhouses at the Cape, at times when the fleets are chiefly expected.[55]

[49] *Ibid*.
[50] Rosenthal, 'Cold Storage Chronicle: History of the Imperial Cold Storage', 3.
[51] Simons, *History of the Imperial Cold Storage Company*, 11.
[52] *Ibid*.
[53] Rosenthal, 'Cold Storage Chronicle: History of the Imperial Cold Storage', 3.
[54] R. Ross, 'The Rise of the Cape Gentry', *Journal of Southern African Studies* 9, 2 (1983), 200.
[55] A. Sparrman, *A Voyage to the Cape of Good Hope, Vol. I* (London: G. G. J and J. Robinson, 1785), 245–46.

Writing of the early nineteenth century Cape, William Burchell made similar observations, noting that a '*slagter's knegt* [butcher's man] is a person commissioned by a butcher in Cape Town to travel into the grazing districts, and buy up the number of sheep or oxen he may require; for which the man pays the grazier.'[56]

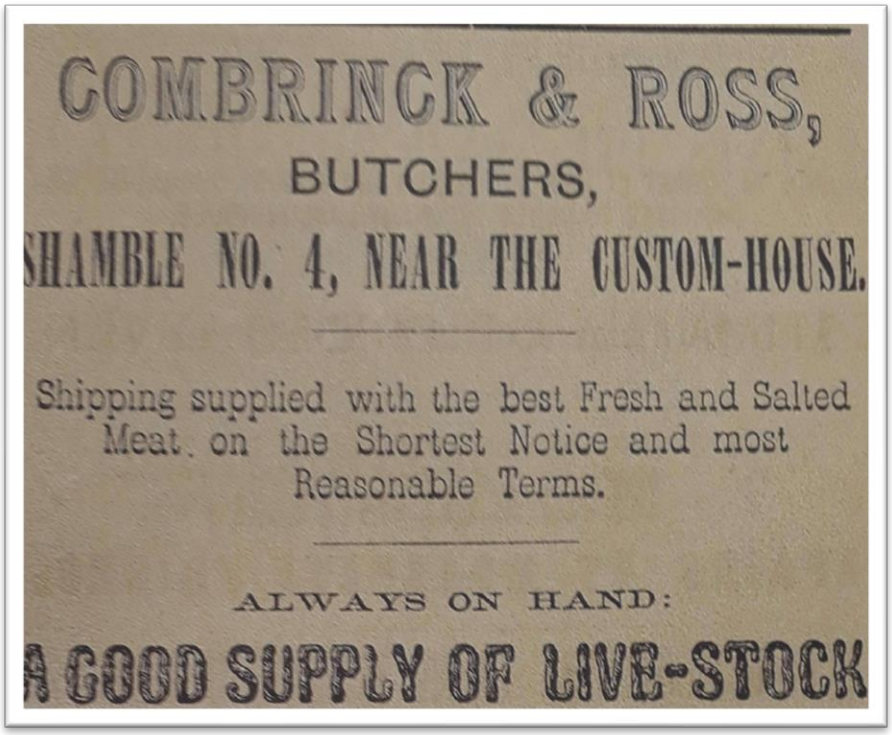
It was not until British control over the Cape commenced that rules regulating slaughter became more rigorous.[57] Until this time animals could be slaughtered wherever independent butchers decided to slaughter them, in the centre of town, outside their houses, in back streets, alongside shops. Blood and viscera and entrails were in the streets, and noxious stenches marked the town.

Since the early nineteenth century, various administrative and other buildings were built close to the Shambles. For example, 'a large handsome building' containing the 'Court of Justice, the Secretary's office, and most of the principal public offices' was built in 1815; a Custom house was built in 1813, and a Commercial Exchange was constructed on behalf of merchants in 1819.[58] Philidia Simons described the Exchange as 'a hive of activity'.[59] So, this place of slaughter was among administrative buildings, merchant and trade operations, and also in constant proximity to the military. The Shambles, or what William Burchell called the 'Butcher's Hall' was rebuilt in 1820.[60] In the same year, British colonial authorities declared that the Shambles would be rearranged and private animal slaughter was forbidden.[61] This marked the beginning of specific colonial laws regulating the slaughter of cattle in the Cape. By 1821 the Burgher Senate, which prefigured the Cape Town Council, passed municipal regulations to the effect that only burghers of the colony could be butchers and cattle sellers.[62] The Senate had re-erected the Shambles building, and divided it into stalls, in which

[56] W. Burchell, *Travels in the Interior of Southern Africa*, *Vol. I* (London: Longman, Hurst, Rees, Orme, and Brown, 1822), 201.
[57] In context of the Netherlands' defeat by Napoleon Bonaparte's French army in 1795 and the liquidation of the VOC in 1799, by 1814 the Netherlands had ceded control of the Cape to Britain at the Dutch-Anglo Treaty of the same year.
[58] Burchell, *Travels in the Interior of Southern Africa*, *Vol. I*, 74.
[59] Simons, *History of the Imperial Cold Storage Company*, 10.
[60] Burchell, *Travels in the Interior of Southern Africa*, *Vol. I*, 74.
[61] Rosenthal, 'Cold Storage Chronicle: History of the Imperial Cold Storage', 4.
[62] Ibid, 5.

each butchery firm positioned itself and had its own slaughter pole.[63] A later advertisement for Shamble number 4 follows.

Image 4.3. Combrinck & Ross advertisement, 1870



Source: P. Simons, *Ice Cold in Africa: The History of the Imperial Cold Storage & Supply Company Limited* (Cape Town: Fernwood Press, 2000), 11.

The advertisement locates the shamble 'near the custom-house', where merchants and traders conducted business. All cattle had to be brought to the Shambles before 8 AM, and there were specific routes along which cattle and sheep had to be driven to the Shambles.[64] In lieu of rent, butchers were taxed for each animal slaughtered.[65] Offal was to be buried, not thrown into the sea. The rules were clearly a way of diminishing human sensory experiences of the Shambles; limiting public experiences of the sights, smells, and sounds. In Chris Otter's framing, it was a British way of 'civilising slaughter'.[66] The Shambles, though regulated by the council, was not a public slaughterhouse, though. It was more a row of private butchers'

[63] Ibid.
[64] P. Laidler, *The Growth and Government of Cape Town* (Cape Town: Unie-Volkspers, 1939), 212–13.
[65] Rosenthal, 'Cold Storage Chronicle: History of the Imperial Cold Storage', 5.
[66] Otter, 'Civilizing Slaughter', 29.

sheds, lined up next to each other, in one convenient place. As with their approach to wagon transport, as seen in Chapter Two, British colonialism differed from Dutch colonialism. The British were far more concerned with regulating and controlling slaughter. Thus, the Cape's shift from VOC refreshment station to an emerging settler colony had implications for cattle, in that their slaughter was increasingly formalised and regulated.

The human sensory assaults accompanying animal slaughter did not go away. The smell of offal putrefying, sights of blood, cattle's death bellows, and confused and disorientated cattle escaping into the streets, reminded the humans of the animal slaughter in their midst. By 1837 a petition to the colonial secretary was presented, complaining of the smells of the slaughterhouses, the groans of cattle, and escapee cattle running in the street.[67] So pronounced were the sensory concerns of Cape residents that by 1845 municipal politics was divided into two camps, the 'clean party' which demanded stronger regulation, and the 'dirty party' which wanted the Shambles to proceed with business as usual.[68] As Eric Rosenthal put it 'nobody in his senses went near the Shambles if he could help it.'[69]

A contemporary observer, Richard Murray, who had seen the Shambles in 1854, mentioned it twice in his *South African Reminiscences* (1894), and both times emphasised the human olfactory and visual discomfort:

> slaughtering shambles were attached to the butcher sale stores, and the drainage from the Shambles – blood and offal – courses along the margin of the Bay… and on hot days the smell of it was nauseating to every living thing but blue-bottle flies.[70]

He went on to write, 'that the military frequently remonstrated, but no remonstrations availed much.'[71] By the 1870s, in two Cape newspapers, the *Cape Argus,* and the *Standard and Mail*, the Shambles was expostulated frequently.[72] The language used was disapproving,

[67] Simons, *History of the Imperial Cold Storage Company*, 13, 17.
[68] *Ibid*, 13; Rosenthal, 'Cold Storage Chronicle: History of the Imperial Cold Storage', 6.
[69] Rosenthal, 'Cold Storage Chronicle: History of the Imperial Cold Storage', 6.
[70] R. Murray, *South African Reminiscences* (Cape Town: J.C Juta & Co, 1894), 2.
[71] *Ibid*, 224.
[72] For links between nineteenth century public health concerns and twentieth century human urban social segregation in the Cape, see M. Swanson, 'The Sanitation Syndrome: Bubonic Plague and Urban Native Policy in the Cape Colony, 1900-1909', *Journal of African History*, 18, 3 (1977), 387–410.

often superlative, and always couched in a hygiene, disease, and human sensory offence vocabulary. The slaughterhouse was referred to as a 'longstanding Shamble grievance'.[73] The Shambles was variously described as 'disgraceful',[74] 'disgusting',[75] 'most offensive and sickening',[76] effecting an 'intolerable stench',[77] and 'not only an eyesore but a positive danger'.[78] Other articles were concerned about a 'fever epidemic' and noted that 'the Military will not allow the troops to go to near them, because they say the health of the troops is imperilled'.[79] A sanitary report from the late 1870s recommended removing the slaughterhouses from the beach to the north of Salt River, noting that the beaches were 'defiled by throwing on them the offal and refuse from the city abattoirs.[80] The Shambles was a sensory offence – in terms of smells, sights, and sounds – to the extent that it was soon sanctioned in a civil court case. If it was repellent to humans, it would have been exponentially more of a sensory affliction for the animals waiting their turn in the adjoining kraals. Since the military berthed their ships at the harbour, and could not well avoid sensory perceptions of the Shambles, disputes between the military and the town council came to a head in the form of a civil case.

In 1883 Colonel Grease, on behalf of the British Garrison, brought a civil case against the Town Council of Cape Town.[81] The court documents, and the newspaper articles reporting on the case in detail, include first-hand accounts from butchers, the Attorney General, and the Secretary of the Medical Board. Various insights which help to understand what the Shambles was like for cattle emerge. Public annoyance at the Shambles' sights and smells had accumulated over the nineteenth century, and the timing of the court case was likely a result of this and Colonel Grease being willing to pursue the matter on behalf of his troops.

[73] *Standard and Mail*, March 11, 1871.
[74] *Standard and Mail*, May 16, 1871.
[75] *Standard and Mail*, 21 Feb, 1871.
[76] *Cape Argus*, February 1, 1872.
[77] *Standard and Mail*, May 16, 1871.
[78] *Standard and Mail*, March 11, 1871.
[79] 'Drain to the Shambles', *Cape Argus*, 25 October, 1877, 3; *Standard and Mail*, March 11, 1871.
[80] W. Black, 'Sanitary State of Cape Town' *Sanitary Record*, 17 August 1887, 4.
[81] Cape Archives (hereafter CA), CSC 2/1/1/213 Vol 4 Illiquid Causes. Colonel Crease vs. Town Council of Cape Town, 15 June, 1883. The following discussion is based on this file.

According to the manager at shamble no. 4, Mr D. Turnbull, some 45 to 50 cattle per week and 80 sheep per day met their deaths in his shamble alone.[82] There were 16 shambles units. The slaughter process required draining blood from animals. Assume an average slaughter rate of 45 cattle per week, and an average weight of 500 kilograms per cattle. Assume further that cattle have a blood to weight ratio of 55 millilitres of blood to 1 kilogram of body weight.[83] 500 kilograms times 45 cattle per week, multiplied by 55 millilitres equals 1 237 500 ml or 1 237.5 litres of cattle blood per week, for one of 16 shambles. That is, in one year Mr Turnbull's shamble alone could plausibly let 66 825 litres of cattle blood. As one abstract indicator of their experiences, cattle lost a serious amount of blood at the Shambles, weekly.

To wash away the blood, each shamble received 41 640 litres of water per day.[84] Cape Town water supply in the summer months was 1 892 706 litres per day, and since there were sixteen shambles, over one-third of Cape Town's water supply in summer was used to clean the Shambles.[85] Each shamble had a drain for draining cattle's entrails and blood onto the beach. The Shambles' floors, on which bovine and caprine hooves stood or against which their bodies were pressed, were 'paved with hard bricks and cement'. During the trial, one butcher, J.P Mostert, noted that 'of course while slaughtering was going on it was not fit for respectable people to [watch]'.[86] Some hints of what cattle experienced emerge. J.P Mostert disclosed that in his shamble unit the 'cattle all bled to death owing to the Mohamedan [sic] method. The priest cut the animals' throats and they bled to death'. He continued that '[i]t was only the wild oxen who made much noise – not the tame animals (laughter).'[87] On another occasion the 'cries of dying oxen' was mentioned and was again met with laughter in the courtroom.

Because they have brains which include forebrains, limbic systems, and hypothalamuses, cattle experience fear, anxiety, and distress. The aggregate of such feelings in the Shambles,

[82] CA, CSC 2/1/1/213 Colonel Crease, 15 June 1883.
[83] M. Reynolds, 'Plasma and Blood Volume in the Cow Using the T-1824 Hematocrit Method', *American Journal of Physiology-Legacy Content* 173, 3 (1953), 421–27.
[84] CA, CSC 2/1/1/213, Colonel Crease, 15 June 1883. 11 000 gallons equals 41 639.53 litres.
[85] 500 000 gallons equals 1 892 705.892 litres. (11 000 gallons x 16 shambles) ÷ 500 000 gallons of daily supply = 0.32. 0.32 x 100 = 32% of total Cape Town daily summer water supply. 'Supreme Court, before Mr Justice Dreyer', *The Cape Argus,* 16 June, 1883, 3.
[86] CA, CSC 2/1/1/213, Colonel Crease, 15 June 1883.
[87] Ibid.

from the mid-seventeenth century, through to the late nineteenth century is unquantifiable. It is important to note, from a cattle-centric historical perspective, that each cattle who met her end with her neck tied to a slaughter pole had a personal, psychological, affective, and sensorily felt experience of the Shambles. This individual experience would have been expressed outwardly, as is the way of cattle, by groans, bellowing, writhing, and foaming at the mouth; with eyes jacked wide open, expressing distress and alarm. Plausibly, their cortisol levels soared, and their breathing became rapid as their hearts pounded. I had occasion during fieldwork for this project to spend a month among a herd of free-roaming Nguni cattle. I often witnessed how easily frightened and conflict avoidant cattle are. The merest unexpected hand movement caused a startle. To goad horned cattle to hard-floored, blood- and entrail-slippery, cramped shamble units, and fasten their necks to the slaughter poles must have entailed acute negative emotions for the cattle. There was no doubt much frantic jerking and thrashing about in the small shamble units.

Mr Upington, for the defence, jeered as squeamish the military's Major Gorges: 'The sight of blood seemed too much for Major Gorges, and the cries of ox affected him extremely (great laughter).'[88] There are three mentions of cattle and sheep escaping the Shambles and making their way to the commissariat's office. Clearly, such escape attempts were expressions of agency and resistance.

For cattle, olfactory perception is a fundamental source of information. As discussed in Chapter One, cattle can smell stress hormones in their fellow cattle's urine, which acts as an emotional contagion. Cattle's vocalisations correspond to discrete emotional states and they communicate these valences to each other.[89] For bovines, as social animals who operate in herds, intergroup communication is an elementary aspect of their existence. It is a Darwinian necessity. Thus, cattle would have communicated to each other what they felt at the Shambles. If humans' sensory perceptions of the stench from the Shambles afflicted them as intensively as the evidence tells, and their cries were memorable enough to be recorded in court proceedings and newspapers, what must the cattle have experienced, cramped together in small kraals, after long journeys, either by foot or on metal-floored train carriages,

[88] CA, CSC 2/1/1/213, Colonel Crease, 15 June 1883.
[89] See Chapter One.

smelling the innards of their kin on the stained floors, hearing their fellows as they stomped, shook and jerked away from the butcher's poleaxe? As they thrashed around, with necks tied to slaughter poles, what were their internal qualitative *felt* experiences? What was the collective mood or the individuated psychological state of the cattle, the sheep, the goats, the calves and pigs, as they waited in incarceration? These are the types of questions that an investigation of the experiential impacts of colonialism can highlight.

Cattle and humans have commonalities in the form of shared brain features, perceptual faculties, and neurochemicals. Foregrounding these commonalities, and then wondering what it was like for the cattle enables one to begin contemplating what cattle experienced at the Table Bay Shambles. This coheres with philosopher Elisa Aaltola's notion of embodied empathy, in which empathy with animals is enabled upon recognition that an animal is an embodied subject.[90] For cattle, goats, sheep, and pigs, stress was a default emotional state at the Shambles. Waiting in their kraals, cattle saw, smelt, and heard the workings of the Shambles, although at much closer range than the general public. They would have been frightened, exhausted, and hungry. Even before entering the Shambles, each animal suffered an internal, private hell. Shakingly, they lined up in great numbers, waiting to be killed. This is a core legacy of Dutch and British colonialism in southern Africa, which comes into view when an animal perspective is adopted, and which is invisible in human-centred history.

The jury's verdict was that the Shambles was indeed a public nuisance and that 'it [was] impossible to use the Shambles for slaughter without danger to the health of the plaintiff, his servants, and the public'.[91] In the following several years, the council was forced to close the Shambles, and animal slaughter reoccurred in the back streets in Cape Town.[92] The closure of the Shambles and the re-emergence of private slaughter did not last long. From the 1890s there began a shift from private to public slaughterhouses. It occurred against a social backdrop of frequent animal eating.

[90] E. Aaltola, *Varieties of Empathy: Moral Psychology and Animal Ethics* (London: Rowman & Littlefield, 2018), 103–27.
[91] CA, CSC 2/1/1/213 1883 Colonel, 15 June 1883.
[92] E. van Heyningen, 'Public Health and Society in Cape Town, 1880-1910' (PhD Dissertation, University of Cape Town, Cape Town, 1989), 263.

By this time, frequent animal flesh eating had become normalised. In 1892 Cape of Good Hope resident Hildagonda Duckitt published a recipe book entitled *Hilda's 'Where is it?' of Recipes* (1892). The recipe book contained contemporary Cape, Indian, Dutch, and Malay recipes. Almost every single recipe makes use of domesticated animal flesh, body parts, or secretions as ingredients. The book includes recipes for 'beef tea', 'brine for tongue' and a jam made from four calves' feet.[93] Although a cultural artefact, and not indicative of all diets in the Cape, the book does suggest that frequent, normalised eating of domesticated animals was an entrenched cultural practice in the late nineteenth century.

The shift to British settler colonialism in the early nineteenth century had other consequences for cattle. New laws started to regulate animal slaughter, and public opinion, expressed in newspapers, and culminating in the 1883 court case was divided over whether the sights, smells, and sounds should afflict the humans who saw, heard, and smelled the workings of the slaughterhouses. These contentions would later lead to health, veterinary, and local government structures being involved in the administration and regulation of animal slaughter in the early twentieth century. The accounts of butchers during the court case, and inferences about the amount of bloodshed, coupled with a recognition of cattle's experiential capacities, provide some hints as to what cattle's experiences of the Shambles may have been like in the late nineteenth century.

The early forms of state legal interventions in animal slaughter prefigured the more closely controlled, centralised, state-run, industrialised slaughterhouses of the early twentieth century. Two factors in the late nineteenth century in particular galvanised the development of industrialised slaughter, which was the next significant impact of colonialism on cattle in the region. These were the British Army's animal flesh war contracts, and the mining houses' animal flesh rations for mineworkers. Both of these occurred in wake of the development of refrigerated transport technology and railway expansion.

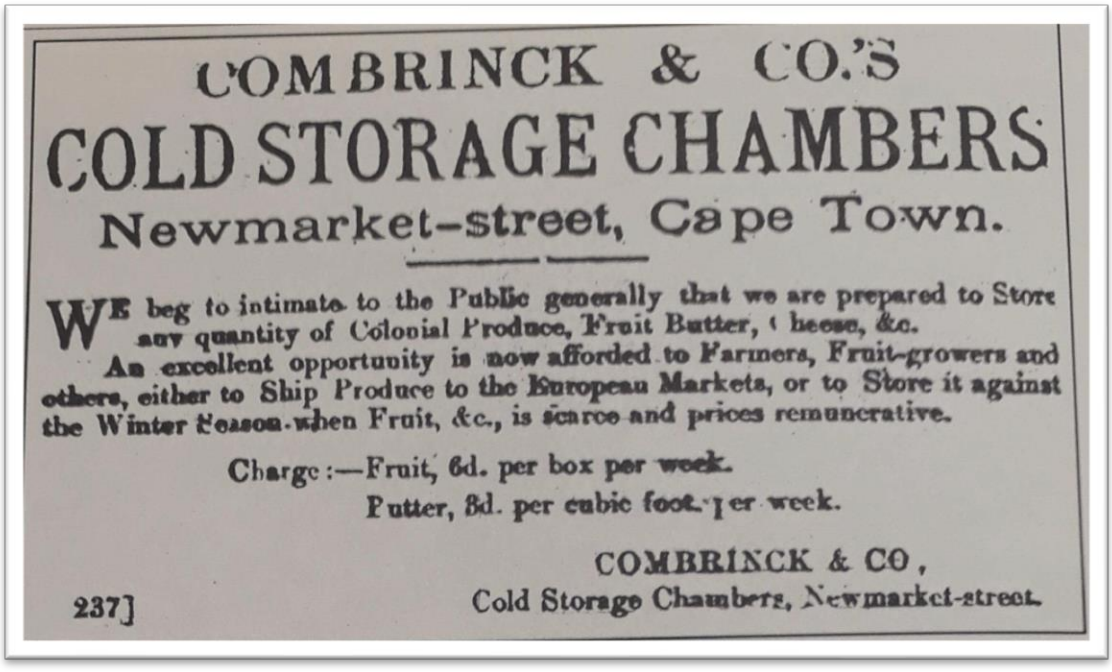
[93] H. Duckitt, *Hilda's 'Where Is It?' Of Recipes* (London: Chapman and Hall, 1892), 15, 109, 121, and *passim*.

The South African War, mining contracts, legislation, and the emergence of industrial slaughter, 1890s–1914

The South African War had a dramatic impact on cattle, and galvanised the development of slaughterhouses in South and southern Africa by injecting large sums of capital into its animal flesh industries. The war played a decisive role in the development of major animal flesh industries in the region.

In the Cape, from the 1870s into the 1890s a monopolistic butchery and cold storage enterprise, Combrinck and Co., under the direction of David De Villiers Graaf, had grown steadily in influence and reach.[94] After travelling abroad to learn of and then import new refrigeration technologies, David Graaf had set up the region's first cold storage plants in the early 1890s, and by the late 1890s he had set up cold storage infrastructure at strategic points along the railway from Cape Town to Johannesburg.[95]

Image 4.4. Cold storage advertisement, 1879


COMBRINCK & CO.'S
COLD STORAGE CHAMBERS
Newmarket-street, Cape Town.

WE beg to intimate to the Public generally that we are prepared to Store any quantity of Colonial Produce, Fruit Butter, Cheese, &c.
An excellent opportunity is now afforded to Farmers, Fruit-growers and others, either to Ship Produce to the European Markets, or to Store it against the Winter Season when Fruit, &c., is scarce and prices remunerative.

Charge:—Fruit, 6d. per box per week.
Butter, 8d. per cubic foot per week.

COMBRINCK & CO,
Cold Storage Chambers, Newmarket-street.

237]

Source: Simons, *History of the Imperial Cold Storage Company,* 36.

[94] E. Dommisse, *Sir David de Villiers Graaff: First Baronet of De Grendel* (Cape Town: Tafelberg, 2011), 88.
[95] Simons, *History of the Imperial Cold Storage Company*, 23.

By 1895 a ten-year monopoly contract had also been secured with the Cape Government Railways, meaning that David Graaf's firm had exclusive use of the Cape railways for transporting frozen animal flesh, at fixed rates, which offered long term financial planning to both parties.[96] He also had cold storage facilities in Aliwal North near the borders of Lesotho and the Orange Free State, Beaufort West, Kimberley, and Port Elizabeth.[97] By the late 1890s, David Graaf's flesh businesses were decried as monopolistic in the *South African Review* newspaper, and he had butcheries and cold storage infrastructure and networks in Cape Town, Port Elizabeth, Pietermaritzburg, and Durban.[98] He was the most important figure in the development of the region's major animal flesh industry.

Directly after the 1886 gold-bearing ore discoveries, a wave of investors, engineers, technicians, geologists, prospectors, lawyers, traders, labourers, and large sums of capital moved into the Transvaal Republic.[99] The Transvaal's revenue climbed nearly tenfold, from £178 000 in 1885/6 to £1 500 000 in 1888/9.[100] Britain paid attention. The Bank of England doubled its gold reserves to a total of £49 million in 1896.[101] As discussed in Chapter Three, the cattle population of the southern African region was dramatically reduced by the rinderpest epidemic of 1896-1897; 2 500 000 cattle perished in the region. [102] There was thus a shortage of cattle flesh in the quickly expanding market. In 1896 David Graaf's businesses imported 194 871 kilograms of frozen animal flesh from Australia, and by 1898 total imported animal flesh comprised 888 024 kilograms – an increase of 693 153 kilograms in two years.[103] David Graaf's control of frozen flesh imports was total by 1898.[104] He amalgamated his butchery and cold storage companies to form the monopolistic South African Cold Storage and Supply Company Limited on 4 May 1899.[105]

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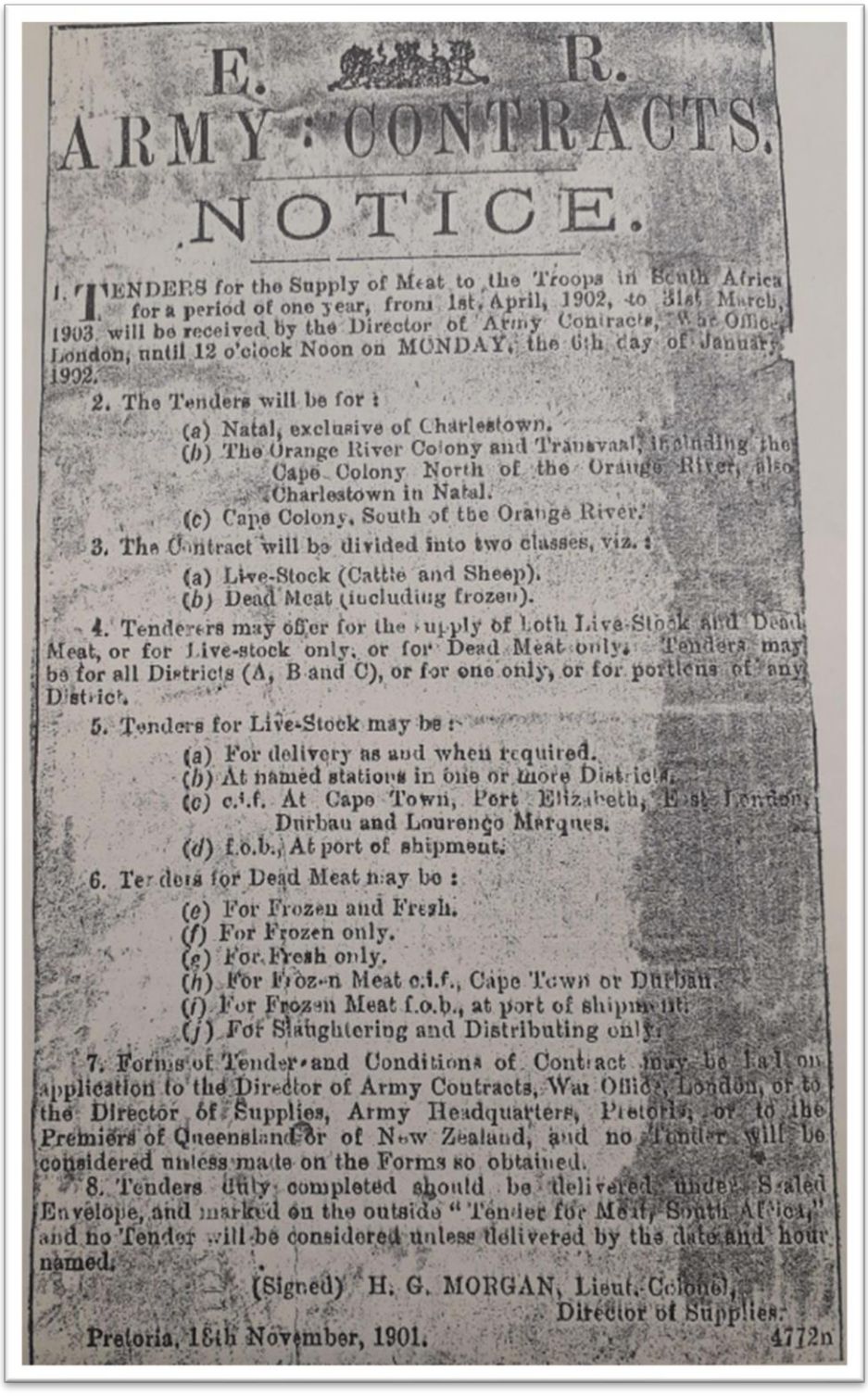
[96] Union of South Africa, *Board of Trade and Industries Report No. 54 Meat, Fish, and Other Foodstuffs: An Inquiry Into* (Pretoria: Government Printers, 1925), 2.
[97] Dommisse, *David de Villiers Graaff*, 85; Simons, *History of the Imperial Cold Storage Company*, 46, 48.
[98] Union of South Africa, *Report of the Commission of Enquiry into Abattoir and Allied Facilities* (Pretoria: Commission of Enquiry into Abattoir and Allied Facilities, 1964), 18–19; Simons, *History of the Imperial Cold Storage Company*, 46, 48, 50, 55.
[99] L. Callinicos, *Gold and Workers* (Johannesburg: Raven Press, 1985), 8–9.
[100] C. Bundy, *The Rise and Fall of the South African Peasantry* (Cape Town: David Philip, 1988), 111.
[101] S. Marks and S. Trapido, 'Lord Milner and the South African State', in P. Bonner (ed.), *Working Papers in Southern African Studies: Volume 2* (Johannesburg: Ravan Press, 1981), 52.
[102] See Chapter Three.
[103] Simons, *History of the Imperial Cold Storage Company*, 51.
[104] Dommisse, *David de Villiers Graaff*, 89.
[105] The Graaf Trust Papers, MC. 55. 5.

When the South African War began, the British Army brought with them to southern Africa a demand for animal flesh on a scale the region and its animals had likely never experienced before. In 1899 colonel W. Richardson, who was tasked to secure supplies and transport, advertised tenders for the animal flesh supply for British troops, and David Graaf's firm was best placed, and won a contract to supply 181 436 kilograms of animal flesh.[106] He imported the flesh from Australia and sold it for three times the import cost.[107] A second contract, five times larger than the previous one, for 907 185 kilograms of flesh, was secured in 1900.[108] At its height, the contract was to supply animal flesh for 250 000 British troops.[109] This implied a tremendous capital injection into David Graaf's animal flesh company. Phillida Brookes writes that 'never before had an army in the field been provided with… fresh meat' and that 'never before had a catering operation of such magnitude or logistical complexity been undertaken before'.[110] Significantly, these large sums of capital injected into an already monopolistic mega firm, powered the development of industrialised slaughter industries. An advertisement for the following year's tender is reproduced below.

[106] S. Miller, *Lord Methuen and the British Army: Failure and Redemption in South Africa* (London: Frank Cass, 2008), 239; Union of South Africa, *Board of Trade and Industries Report No. 54 Meat, Fish, and Other Foodstuffs*, 4, 9; Simons, *History of the Imperial Cold Storage Company*, 57.
[107] Simons, *History of the Imperial Cold Storage Company*, 57.
[108] Simons, 60.
[109] Royal Commission, *Report of His Majesty's Commissioners Appointed to Inquire into the Military Preparations and Other Matters Connected with the War in South Africa* (London: His Majesty's Stationery Office, 1903), 140.
[110] Simons, *History of the Imperial Cold Storage Company*, 58–59.

Image 4.5. British Army animal flesh contract tender advertisement, 1901



E. R.

ARMY CONTRACTS.

NOTICE.

1. TENDERS for the Supply of Meat to the Troops in South Africa for a period of one year, from 1st April, 1902, to 31st March, 1903, will be received by the Director of Army Contracts, War Office, London, until 12 o'clock Noon on MONDAY, the 6th day of January, 1902.

2. The Tenders will be for :

(a) Natal, exclusive of Charlestown.
(b) The Orange River Colony and Transvaal, including the Cape Colony North of the Orange River, also Charlestown in Natal.
(c) Cape Colony, South of the Orange River.

3. The Contract will be divided into two classes, viz. :

(a) Live-Stock (Cattle and Sheep).
(b) Dead Meat (including frozen).

4. Tenderers may offer for the supply of both Live-Stock and Dead Meat, or for Live-stock only, or for Dead Meat only. Tenders may be for all Districts (A, B and C), or for one only, or for portions of any District.

5. Tenders for Live-Stock may be :

(a) For delivery as and when required.
(b) At named stations in one or more Districts.
(c) c.i.f. At Cape Town, Port Elizabeth, East London, Durban and Lourenço Marques.
(d) f.o.b., At port of shipment.

6. Tenders for Dead Meat may be :

(e) For Frozen and Fresh.
(f) For Frozen only.
(g) For Fresh only.
(h) For Frozen Meat c.i.f., Cape Town or Durban.
(i) For Frozen Meat f.o.b., at port of shipment.
(j) For Slaughtering and Distributing only.

7. Forms of Tender and Conditions of Contract may be had on application to the Director of Army Contracts, War Office, London, or to the Director of Supplies, Army Headquarters, Pretoria, or to the Premiers of Queensland or of New Zealand, and no Tender will be considered unless made on the Forms so obtained.

8. Tenders duly completed should be delivered under Sealed Envelope, and marked on the outside "Tender for Meat, South Africa," and no Tender will be considered unless delivered by the date and hour named.

(Signed) H. G. MORGAN, Lieut.-Colonel,
Director of Supplies.

Pretoria, 18th November, 1901. 4772n

Source: Simons, *History of the Imperial Cold Storage Company*, 62.

The bulk of the cattle supplied to the British troops was in the form of frozen flesh, transported by refrigerated trains and ships. A smaller percentage of cattle were forcibly

marched alongside British troops – towards troops too far from railways or roads – and then slaughtered in the veld.[111] These doomed cattle, unacknowledged casualties and prisoners of the South African War, deserve mention. Two images of slaughtered cattle at British troops' camps are reproduced below.

Image 4.6. Cattle being flayed post-slaughter at a British Army camp

Source: Simons, *History of the Imperial Cold Storage Company,* 59.

[111] *Ibid*.

Image 4.7. Dressed cattle at a British soldiers' camp

Source: Simons, *History of the Imperial Cold Storage Company,* 59.

The other major impact of the colonial war, from a bovine perspective, was the scorched earth policy. First initiated by Lord Roberts, chief commander of the British forces, in September 1900, the command was to burn Boer homesteads within a 16-kilometre radius of any Boer military attack, and confiscate or slaughter the sheep, goats, and cattle.[112] When Lord Kitchener took over, he doubled down on this policy and razed about 30 000 Boer homes and tens of thousands of Africans' homes.[113] In the British concentration camps, a likely undercounted 51 000 Afrikaners and Africans perished.[114] Estimates of the animal death toll from the war are almost eight times as high, at 400 346.[115]

Jan Smuts, a general for the Boer military, while in the Cape in 1901 noted that:

> Dams everywhere full of rotting animals; water undrinkable. Veld covered with slaughtered herds of sheep and goats, cattle and horses. The horror passes description… Surely such outrages on man and

[112] G. van den Bergh, 'The British Scorched Earth and Concentration Camp Policies in the Potchefstroom Region, 1899–1902', *Scientia Militaria, South African Journal of Military Studies* 40, 2 (2012), 77.
[113] A. Wessels, 'The Anglo-Boer War (1899 – 1902) and Its Traumatic Consequences', in P. Gobodo-Madikizela (ed.), *Breaking Intergenerational Cycles of Repetition a Global Dialogue on Historical Trauma and Memory* (Berlin: Barbara Budrich Publishers, 2016), 163.
[114] *Ibid*.
[115] W. Direko, L. Changuion, and F. Jacobs, *Suffering of War: A Photographic Portrayal of the Suffering in the Anglo-Boer War Emphasising the Universal Elements of All Wars* (Bloemfontein: Kraal Publishers for War Museum of the Boer Republics, 2003), 112.

> nature must move to a certain doom... The moral debasement which can inflict such horrible sufferings on innocent must be something appalling.[116]

Since cattle were to Boers both food and transport, *qua* flesh, milk, *biltong* (dried salted animal flesh) and draught oxen, an important part of destroying Boer military capabilities involved slaughtering cattle, sheep and goats. Sheep, goats, horses, and cattle were driven to British camps and then slaughtered. The image below depicts a scene on a Bultfontein farm where British troops had corralled hundreds of sheep from farms near the Vet and Sand Rivers, and then slaughtered them.[117] On a neighbouring farm, 300 horses were driven into a kraal and then shot.[118]

Image 4.8. Sheep slaughtered on a Bultfontein farm

Source: Direko, Changuion, and Jacobs, *Suffering of War: A Photographic Portrayal of the Suffering in the Anglo-Boer War* (Bloemfontein: Kraal Publishers for War Museum of the Boer Republics, 2003), 110.

The other major causative factor in the development of industrialised slaughter industries was the demand for animal flesh created by the mining houses' migrant labour compounds. In mining compounds in Kimberley, mineworkers were in the late nineteenth century supplied

[116] W. Hancock (ed.), *Selections from the Smuts Papers, Volume 1* (Cambridge: Cambridge University Press, 1966), 408.
[117] Direko, Changuion, and Jacobs, *Suffering of War: A Photographic Portrayal of the Suffering in the Anglo-Boer War*, 110.
[118] *Ibid*.

with 450 grams of animal flesh per day.[119] By the 1920s the Corner House mining group alone would purchase 589 670 kilograms of 'flesh'/offal per month, and an estimated 80 000 cattle were killed annually to supply flesh/offal for all compounds.[120] From the late nineteenth century, as Robert Morrell put it, the '"compound contracts" constituted the single most important part of the South African beef market', and mine owners were 'anxious to procure these supplies cheaply'.[121] Comprising enormous demand for animal flesh, the gold and diamond mines thus had a tremendous influence on the expansion and development of animal agriculture in South Africa. In the coming decades, the Rand would become a centre of a regional trade in cattle flesh. For example, most of the cattle the British South Africa Company and settlers stole from the Ndebele in the late nineteenth century was sold to the Johannesburg and Kimberley markets.[122] In 1898 over £1 million worth of animal products were imported into what became South Africa.[123] By 1919 South Africa imported thousands of cattle from Southern Rhodesia, the Bechuanaland Protectorate, South West Africa, and Swaziland.[124] This persisted for decades, on South Africa's terms. In 1949, for example, 208 446 cattle were imported from these countries.[125]

Because of the size of animal flesh contracts for mine compound contracts at the turn of the twentieth century, and the mining houses' disinclination to be bound to purchase animal flesh from David Graaf's monopolistic firms, the mining houses formed their own heavily capitalised cold storage and animal flesh industry. De Beers Consolidated Investments, powered by Cecil John Rhodes and with the ear of Lord Rothschild, managed to win the British Army contract in 1902.[126]

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[119] R. Morrell, 'Farmers, Randlords and the South African State: Confrontation in the Witwatersrand Beef Markets, c. 1920-1923', *The Journal of African History* 27, 3 (1986), 514; R. Turrell, 'Kimberley's Model Compounds', *The Journal of African History* 25, 1 (1984), 69.
[120] Morrell, 'Farmers, Randlords and the South African State', 513.
[121] *Ibid*, 513, 514.
[122] I. Phimister, 'Meat and Monopolies: Beef Cattle in Southern Rhodesia, 1890-1938', *The Journal of African History* 19, 3 (1978), 396.
[123] The National Archives at Kew (hereafter TNA), CO 633/148, *Report of the Secretary for Agriculture*, 1921, 9. And, see Chapter Five.
[124] See Chapter Five.
[125] Meat Industries Control Board, *Annual Report Livestock and Meat Industries Control Board for the Period 1st September 1950 to 31 August 1951* (Pretoria, 1951), 7.
[126] Simons, *History of the Imperial Cold Storage Company*, 71.

De Beers Consolidated Mines, Johannesburg Consolidated Investments, Barnato Brothers Ltd., Lewis & Marks and others joined together to form Imperial Cold Storage Company Limited with a capitalisation of £650 000 in February 1902.[127] But Cecil Rhodes died the next month, and three months later the war ended, producing a recession and a dwindled cattle flesh market. Thus, there was no place for two gigantic over-capitalised competing flesh industries, and the mining houses' company amalgamated in 1902 with David Graaf's company, which had a nominal capital of £1 150 000, to form Imperial Cold Storage and Supply Company Limited, with a capitalisation of £2 000 000.[128] Evidenced by the sheer quantity of capital involved, these two factors, the British war contracts and the mining compound contracts, were likely the two most import driving forces in the development of regional cattle markets and industrialised slaughter institutions. After the British took control of the Boer Republics and while the Union of South Africa was being formed, the state became involved in regulating, operating and constructing public slaughterhouses. The above suggests that two factors, a large, relatively predictable local market for animal flesh, and well capitalised monopolistic industry, drove animal slaughter to become industrialised. This occurred within the context of health, sanitary, and veterinary concerns, public attitudes towards sensorily experiencing slaughterhouses, and the formation of a modern state.

The development of public slaughterhouses in South Africa, as a government report on slaughterhouses later put it, was 'inseparably connected' with state legislation, which vested the control, maintenance and management of slaughterhouses in local government authorities.[129] By the late nineteenth century in the two British colonies, Natal and the Cape, and in the northern Boer republics, Transvaal and the Orange Free State, slaughterhouses were regarded as the province of local authorities, primarily on the basis of health and hygiene considerations.[130]

At the Cape Colony, Act 23 of the 1897 Public Health Amendment Act is likely the first time a slaughterhouse was defined in legislation:

[127] *Ibid*, 74.
[128] *Ibid*, 76, 80.
[129] Union of South Africa, *Report of the Commission of Enquiry into Abattoir and Allied Facilities*, 15.
[130] *Ibid*.

> 'Slaughter-house' shall mean and include the buildings and places commonly called slaughter-houses or abattoirs, and also knacker's yards and any building or place used for slaughtering, or for dressing or preparing the carcasses of cattle, horses, or animals of any description.[131]

Part III 7.4 of the Act explicitly mandated local authorities to pass by-laws to regulate and restrict: animal slaughter; the sale of flesh; the establishment and supervision of slaughterhouses; the disposal of slaughter waste; the inspection of imported flesh; and the prevention of selling diseased or 'unsound and unwholesome' flesh.[132] Sub-section 5 (a) of Section 9 of the same Act further stated that:

> Every urban local authority may from time to time make, alter, or revoke by-laws or regulations for the establishment and maintenance of public slaughterhouses or abattoirs and for regulating the use and the charge to be made for the use of the same.[133]

The Governor, on the advice of the Medical Officer of Health, or based on representations of the relevant local authority, had the authority to promulgate, amend or repeal regulations for slaughterhouses, the inspection of slaughterhouses and cold storage facilities.[134] In Natal, Act 44 of 1901 provided that the Governor-in-Council had powers to make regulations for the construction, inspection, and supervision of slaughterhouses and butcher shops.[135] In the Transvaal, the Volksraad of the Republic agreed to a 'general' public slaughterhouse for Pretoria and in 1890 determined that a single slaughterhouse for Johannesburg be constructed.[136]

After making inspections of slaughterhouses in the Cape, colonial veterinary surgeon Duncan Hutcheon reported in 1902 on the need for state-run, centralised public slaughterhouses. He wrote:

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[131] E. Jackson, *Statutes of the Cape of Good Hope, 1894-1905 (Volume III)* (Cape Town: Cape Times Limited, Government Printers, 1906), 3742.
[132] *Ibid*, 3743–3744
[133] *Ibid*, 3743–3745.
[134] *Ibid*, 3477–3478.
[135] Union of South Africa, *Report of the Commission of Enquiry into Abattoir and Allied Facilities*, 16.
[136] *Ibid*.

> There is nothing more urgently needed at our large centres than one or more properly-constructed and fully-equipped Public Abattoirs placed under Government inspection and control. The majority of the slaughter-houses around Cape Town and other centres are kept in a most disgraceful condition.[137]

Not long after this, in the Cape, the Public Health Amendment Act of 1906, enabled the establishment of a committee – comprising various municipal and local authorities, health officers, veterinary officials, public works officials, and the mayor – to acquire, provision, and maintain and use public slaughterhouses 'and all matters or things in connection therewith'.[138] It was this law that enabled the emergence of an intersectoral committee to manage and establish an industrial slaughterhouse in the Cape, and which bore profound experiential consequences for cattle.

On 9 October 1907, a new institution, the Joint Slaughterhouses Committee, met to discuss and begin to actualise the establishment of a public slaughterhouse in the Cape peninsula.[139] Municipal representatives from Woodstock, Cape Town city, Maitland, and Rondebosch, as well as the government veterinary surgeon, the city engineer, and the Cape Town clerk were present. The formation signalled that the state had begun to institutionalise the construction, operation, maintenance, planning and running of slaughterhouses as the exclusive preserve of local municipalities. They wanted mass slaughter to be centralised, meet hygiene standards, and be positioned out of the public's sensory range, near to a railway.

Informed by specific legislation, the emergence of public slaughterhouses was to be underpinned by intersectoral cooperation between diverse arms of state. The cooperation between different state departments can be read as a form of state-building. From a bovine perspective, various arms of a consolidating state started to develop and entrench centralised public institutions – public slaughterhouses – to maintain and perpetuate the mass slaughter of cattle and other domesticated animals.

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[137] D. Hutcheon, *Report of the Colonial Veterinary Surgeon for the Year 1902* (Cape Town: Cape of Good Hope Department of Agriculture, 1903), 15.
[138] CA, 1 1/4/7/2/1/1. Joint Slaughterhouses Committee Minute Book (hereafter JSCMB) 1907 – 1913. Annexure 'A' Agreement, 125.
[139] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes, 9 October 1907.

For the first five years the primary activity of the Joint Slaughterhouses Committee's sub-committee, mostly chaired by the Mayor of Cape Town, was formulating and executing a plan to construct a new mega public slaughterhouse for Cape Town.[140] From the start, the ambition was to construct a new public slaughterhouse in Maitland, which would be accessible to the nearby railway. The development of the public slaughterhouse comprised the work of a confluence of specialists, including veterinary surgeons, architects, builders, town engineers, and medical professionals.

The first record of a slaughterhouse in Maitland is from 1897, in correspondence between the Department of Public Works' clerk of works and an architect, when a building at 7th Mile in Maitland was inspected and then converted into a makeshift slaughterhouse to slaughter cattle during the rinderpest epidemic.[141] Again, between 1908 and 1914, buildings were rented by the Department of Agriculture to slaughter cattle infected with Tuberculosis. [142]

In conceptualising the new public institution, the committee wanted to determine the extent of its required killing capacities. The Cape Government Railways communicated to the Joint Slaughterhouses Committee that for the year 1907 the following numbers of living animals were transported to Maitland for slaughter: oxen and cattle, 6 749; sheep and goats, 151 301; pigs, 5 044; and calves, 119.[143] The numbers of animal carcasses received at Cape Town via Tulbagh road and Porterville road were: cattle, 2 847; sheep and goats, 38 843; and pigs, 56.[144] These numbers were the basis on which the slaughter-and processing-capacities of the new public slaughterhouse were to be determined. On such a reckoning, it would be required to slaughter and dismember around 204 959 animals per year, or 561 a day, or 70 animals an hour, or more than one animal per minute.[145]

[140] CA, 1 1/4/7/2/1/1, JSCMB, 1907 – 1913.
[141] CA, PWD. 1/4/2 Rinderpest – Maitland Slaughterhouses 1897 December – 1898 August.
[142] CA, CVS, 1/77 Slaughter Houses. Maitland. 4 December 1908 to 18 November 1914.
[143] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. 'Re Public Slaughterhouses meeting: 19 May 1906', 52.
[144] Ibid.
[145] 6 749 oxen and cattle + 151 301 sheep and goats + 5 044 pigs + 119 calves + 2 847 cattle carcasses + 38 843 sheep and goat carcasses + 56 pig carcasses = 204 959 animals. 204 959 ÷ 365 days ÷ 8 hours ÷ 60 minutes = a required slaughter capacity of 1,16 animals per minute, assuming that the slaughterhouse operated for every minute of eight hours per day for 365 days a year.

The slaughterhouse was to be designed to be expanded.[146] By 1911 it was decided that the slaughterhouse would be constructed at Nieuwe Molen, near the Swartrivier in Maitland, at a cost to the municipalities of no more than £35 000.[147] The South African Railways Administration and the committee were authorised to enter an agreement for constructing railway slidings to transport animals to the new slaughterhouse.[148]

By 1912 the tender of two architects, of the firm Messrs Lyon and Fallon, to erect buildings and drainage, and secure its fittings, was accepted by the committee.[149] The two architects were Walter Fallon and John Lyon, who trained in England and Scotland, respectively. Walter Fallon was admitted into the Royal Institute of British Architecture in 1907, and worked in London.[150] John Lyon studied at Gray's School of Art, Aberdeen, and was apprenticed in London and Aberdeen.[151] The first public slaughterhouse in Johannesburg was completed between 1906 and 1910 in Newtown.[152] There, as in the Cape, the human capital for designing slaughterhouses came from Europe. At the turn of the twentieth century, Johannesburg's town engineer, Charles Aburrow, constructed paved streets, public baths, fire stations, drainage systems, and slaughterhouses.[153] He had come to Kimberley from the United Kingdom in the late 1870s, to work for the London & South African Exploration Company.[154] G. Burt Andrews, who helped implement Johannesburg's sewage system, was from England, where he had worked with the Bournemouth Improvement Councillors and at the Hornsey Local Board in London.[155] Before, he had worked as deputy town engineer to town engineer D. Leitch, and D. Leitch had previously been an assistant director of the Architectural and Engineering works in the Admiralty.[156] The intellectual and human capital required to design and build the first public slaughterhouses in what became South Africa were colonial imports

[146] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes, 12 June 1908.
[147] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes, 21 September 1911.
[148] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes, 6 January 1913.
[149] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes, 31 August 1912.
[150] A. Brodie, *Directory of British Architects, 1834 – 1914, Volume 2* (London: Continuum, 2001), 476.
[151] Artefacts Website, 'Lyon, John. Architect', *Artefacts Website*, https://www.artefacts.co.za/main/Buildings/archframes.php?archid=1022 (accessed 6 January 2020).
[152] E. Cripps, 'Provisioning Johannesburg, 1886-1910' (Master's Thesis, University of South Africa, Pretoria, 2012), 14, 119–20.
[153] H. Mäki and J. Harhoff, 'Municipal Engineers in Johannesburg and Pretoria before 1910', *The Journal for Transdisciplinary Research in Southern Africa* 5, 2 (2009), 234, 240, 245.
[154] *Ibid*.
[155] *Ibid*, 242–43.
[156] Mäki and Harhoff, 'Municipal Engineers in Johannesburg', 243.

from England.[157] Public slaughterhouses emerged in the years after the gold discovery and the South African War, when British colonial administrators deepened state-building processes.

Because it was the newest and one of the foremost books on slaughterhouse design in English at the time, it is highly likely that both John Lyon and Walter Fallon consulted Stephen Ayling's *Public Abattoirs: their Planning, Design, and Equipment* (1908) for their design of the Maitland slaughterhouse.[158] A wide range of books on slaughterhouses had been published in English but none had anywhere near the level of architectural detail or number of slaughterhouse designs in Stephen Ayling's book.[159] Stephen Ayling was a member of the Royal Institute of British Architects. In his book, he produced architectural plans for seventeen public slaughterhouses across England, Scotland and France, and included detailed descriptions of their planning, design, layout and functions.[160] Five features that are common to the function and design of slaughterhouses described by Stephen Ayling are lairs (kraals), slaughter halls, dressing rooms, suspension rooms, and, after ammonia refrigeration's invention in the late nineteenth century, cooling chambers.

The new Maitland slaughterhouse had all of these features.[161] There were lairages, or kraals, where cattle, calves, pigs, goats, and sheep would wait. There were main slaughter halls and dressing halls, there was a main cooling hall, a cold storage block, fitted with a Linde Ammonia Refrigerator Plant, a pig slaughter hall and cooling chamber, a tripery, a blood and offal house, a destructor house for incinerating diseased animal flesh and converting it into fertiliser, and a drainage facility, to wash away the animals' excrements and unusable offal.[162] The fittings and chill room plant were modelled on the Johannesburg slaughterhouse at Newtown.[163] In

[157] E. Cripps, 'Provisioning Johannesburg, 1886-1910', 118–19. Elizabeth Cripps shows that in 1895 the Johannesburg town engineer C. Aburrow was attempting to model slaughterhouses and sanitation infrastructure on those in England.
[158] S. Ayling, *Public Abattoirs: Their Planning, Design, and Equipment* (London: E & F.N Spon, 1908).
[159] R. Grantham, *Description of the Abattoirs of Paris* (London: W. Clowes and Sons, 1849); C. Cameron, *Report on the Establishment of Public Abattoirs* (Dublin: Joseph Dollard, 1867); R. Grantham, *A Treatise on the Public Slaughter-Houses* (London: J. Weale and Henry Renshaw, 1884); O. Schwarz, *Public Abattoirs and Cattle Markets*, trans. G. Harrap and L. Douglas (London: Ice Cold Storage Company, 1902); H. Heiss, *The German Abattoir System* (London: George Bell & Sons, 1907); C. Cash, *Our Slaughterhouse System: A Plea for Reform* (London: George Bell & Sons, 1907); Ayling, *Public Abattoirs: Their Planning, Design, and Equipment*, 40–80.
[160] Ayling, *Public Abattoirs: Their Planning, Design, and Equipment*, 40–80.
[161] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes, 24 December 1912.
[162] Ibid; CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes 21 January 1913.
[163] CA, 1 1/4/7/2/1/1. JSCMB 1907 – 1913. Minutes, 24 December 1912.

1914 members of the Cape Institute of Architects visited and approvingly inspected the new slaughterhouse at Nieuwe Molen Maitland, which they found 'instructive'.[164]

Cape Town's previous major slaughterhouse, the Shambles, was a crude building used from the late seventeenth century until the 1890s, with little substantial change. By contrast, in the early twentieth century, the centralised public slaughterhouse in Maitland was a state-run mass slaughter institution. Against the backdrop of specific laws, it was conceptualised by a specific slaughterhouse committee, at times headed by the mayor of Cape Town, and comprising engineers, health and veterinary professionals and the town clerk. The slaughterhouse was designed by professional architects who were trained in Britain and Scotland. The South African Railways Administration too was involved. The Maitland public slaughterhouse signalled the emergence of industrialised animal slaughter in the Cape. For cattle history this development was profound. It meant that, with the backing of state and local bylaws, various arms of state had institutionalised practices of mass slaughtering cattle, sheep, goats, and pigs. There were now centralised, state-operated institutions in Johannesburg and Cape Town to mass slaughter cattle.

According to the national government's *Report of the Meat Trade Commission*, by 1920, in the Cape peninsula, 'all slaughtering' was performed at the Maitland slaughterhouse.[165] The chilling room had a capacity for 200 cattle carcasses and 1 000 sheep carcasses, and butchers could keep the carcasses there for up to seven days.[166] Thereafter the carcasses were carried to all parts of the peninsula on wagons.[167] As a further indignity, cattle and horses were thus tasked with transporting their butchered kin across the peninsula.

Around the time the Maitland municipal slaughterhouse was built, and over the next two decades, public industrial slaughterhouses in the Cape Colony started to proliferate. These were designed for municipalities in Mafikeng (1909),[168] Oudtshoorn (1912),[169] Caledon

[164] *The African Architect* 3, 12 (1914), 336.
[165] Union of South Africa, *Report of the Meat Trade Commission* (Pretoria: Cape Times Limited, Government Printers, 1920), 22.
[166] *Ibid*.
[167] *Ibid*, 23.
[168] CA, M3/4584.
[169] CA, M2/2402.

(1915),[170] Stellenbosch (1917),[171] George (1921),[172] Colesberg (1923),[173] Paarl (1924),[174] Queenstown (1924),[175] East London (1924),[176] Calvinia (1927),[177] Somerset Strand (1927),[178] Knysna (1927),[179] Wynberg (1928),[180] Strand (1928),[181] Braeside (1928),[182] Wellington (1929),[183] and De Aar (1934),[184] for example.

Across South Africa, there was variation in the development of slaughterhouses. In Newtown, Johannesburg, there was a centralised state-run slaughterhouse by 1910.[185] There were municipal slaughterhouses in Durban and Pietermaritzburg by the 1920s.[186] In Kimberley, there was no state-run slaughterhouse, and animals were instead slaughtered at nine private slaughterhouses.[187] In Bloemfontein there was a municipal slaughterhouse, and municipal cold storage facilities.[188] With varying success, the region's behemoth animal flesh company, Imperial Cold Storage and Supply Company, in the 1920s set up export slaughterhouses in Walvis Bay, South West Africa (1922), Bulawayo, Southern Rhodesia (1925), and Lobatse, Bechuanaland (1927).[189]

It is crucial to emphasise from a bovine historical perspective that over this period animal killing became an industrialised process. The public slaughterhouse was but one institution, dramatically impactful for domesticated animals, that emerged within a broader shift from

[170] CA, M3/959.
[171] CA, M3/4842.
[172] CA, M1/3889.
[173] CA, M1/1468.
[174] CA, M2/2189.
[175] CA, M2/2549.
[176] CA, M3/3731.
[177] CA, M2/1628.
[178] CA, M2/2675.
[179] CA, M3/4869.
[180] CA, M2/1629.
[181] CA, M2/2436.
[182] CA, M3/4476.
[183] CA, M2/2352.
[184] CA, M3/1577.
[185] Cripps, 'Provisioning Johannesburg, 1886-1910', 14, 119–20.
[186] Union of South Africa, *Report of the Meat Trade Commission*, 21.
[187] *Ibid*.
[188] *Ibid*.
[189] M. Hubbard, 'Desperate Games: Bongola Smith, the Imperial Cold Storage Company and Bechuanaland's Beef, 1931', *Botswana Notes and Records* 13 (1981), 19. See Chapter Five for a discussion of the Lobatse slaughterhouse in Bechuanaland.

agrarian to industrial systems that occurred alongside and in wake of the industrial revolution in Europe.[190] The new public slaughterhouses were usually outside of towns and were state-regulated, out of sight, beyond the perceptual range of most humans.[191] In her social history of slaughterhouses, Amy Fitzgerald notes that the industrialisation of animal slaughter was exemplified by the Union Stockyard in Chicago in the late nineteenth century.[192] Developments in refrigerated storage and transport, observed above in the Cape, enabled this shift. The slaughter process became increasingly mechanised, involving conveyor belt systems to increase speed, efficiency and killing capabilities.[193]

No less than Henry Ford's assembly-line production, in his own words, emerged from inspiration he gained while visiting the Chicago slaughterhouses as a young man. Speaking of his first assembly line attempt in 1913, he says:

> I believe that this was the first moving line ever installed…. The idea [of the assembly line] came in a general way from the overhead trolley that the Chicago packers use in dressing beef.[194]

It was industrialised slaughterhouses in Chicago that provided models for Fordist factory production lines.

Industrial slaughterhouses, cattle's experiences, and new slaughter legislation, 1915–1935

Having traced the development of slaughterhouses in the Cape, this section moves to an analysis of public slaughterhouses by examining architectural designs and the various parts and functions of these institutions. The analysis is informed by first-hand accounts of slaughterhouses in the Cape, undertaken by the SPCA and journalists for *Die Burger* newspaper. It offers an attempt to get *into* the slaughterhouse, with an eye to making reasoned inferences about what cattle likely experienced.

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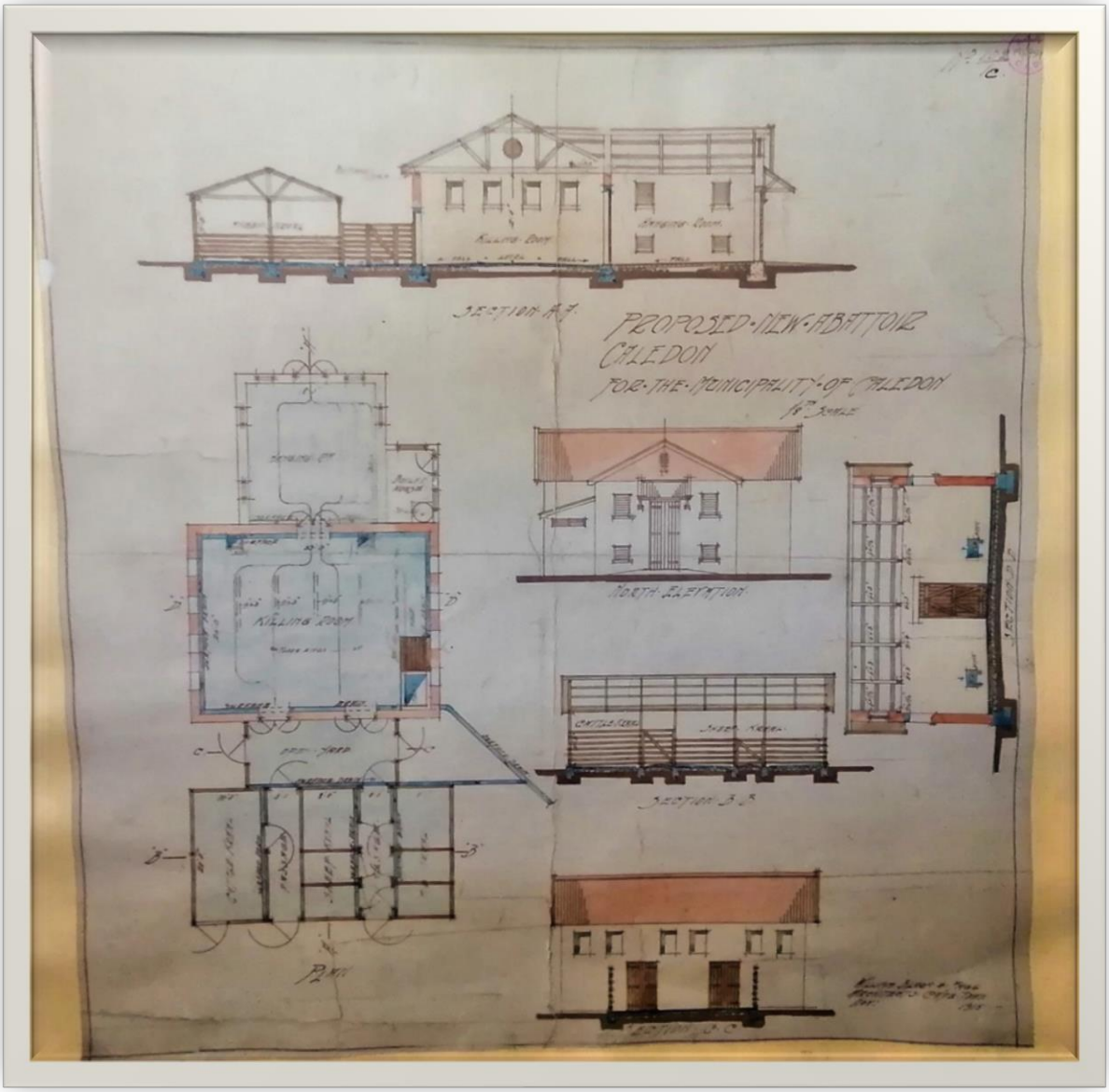
[190] Fitzgerald, 'A Social History of the Slaughterhouse', 59.
[191] *Ibid*, 59–60.
[192] *Ibid*, 58, 60.
[193] *Ibid*, 61.
[194] H. Ford, *My Life and Work* (New York: Doubleday, Page & Company, 1923), 81.

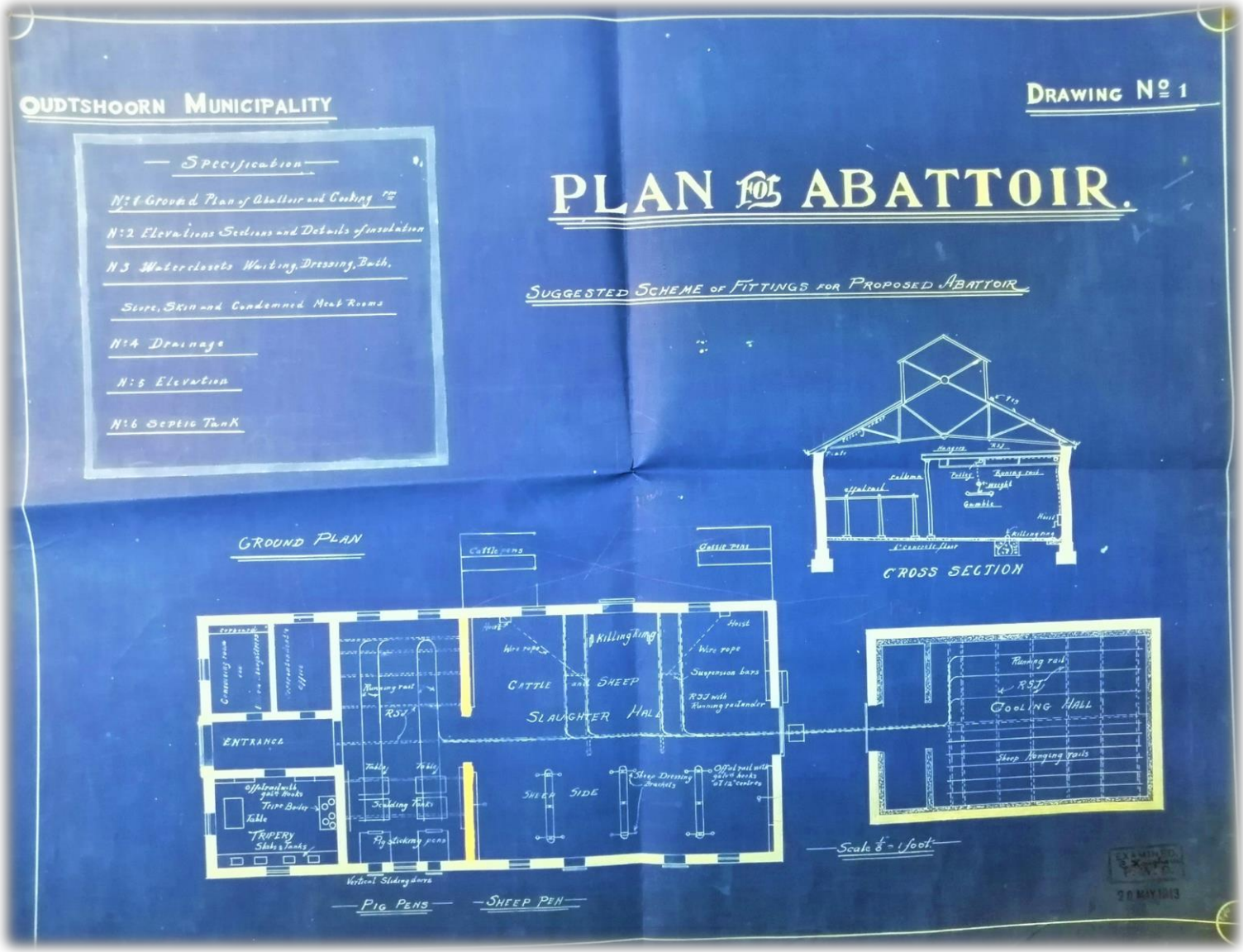
The following images are designs of public slaughterhouses in the Cape during the first three decades of the twentieth century.

Image 4.9. Public slaughterhouse design, Caledon 1915



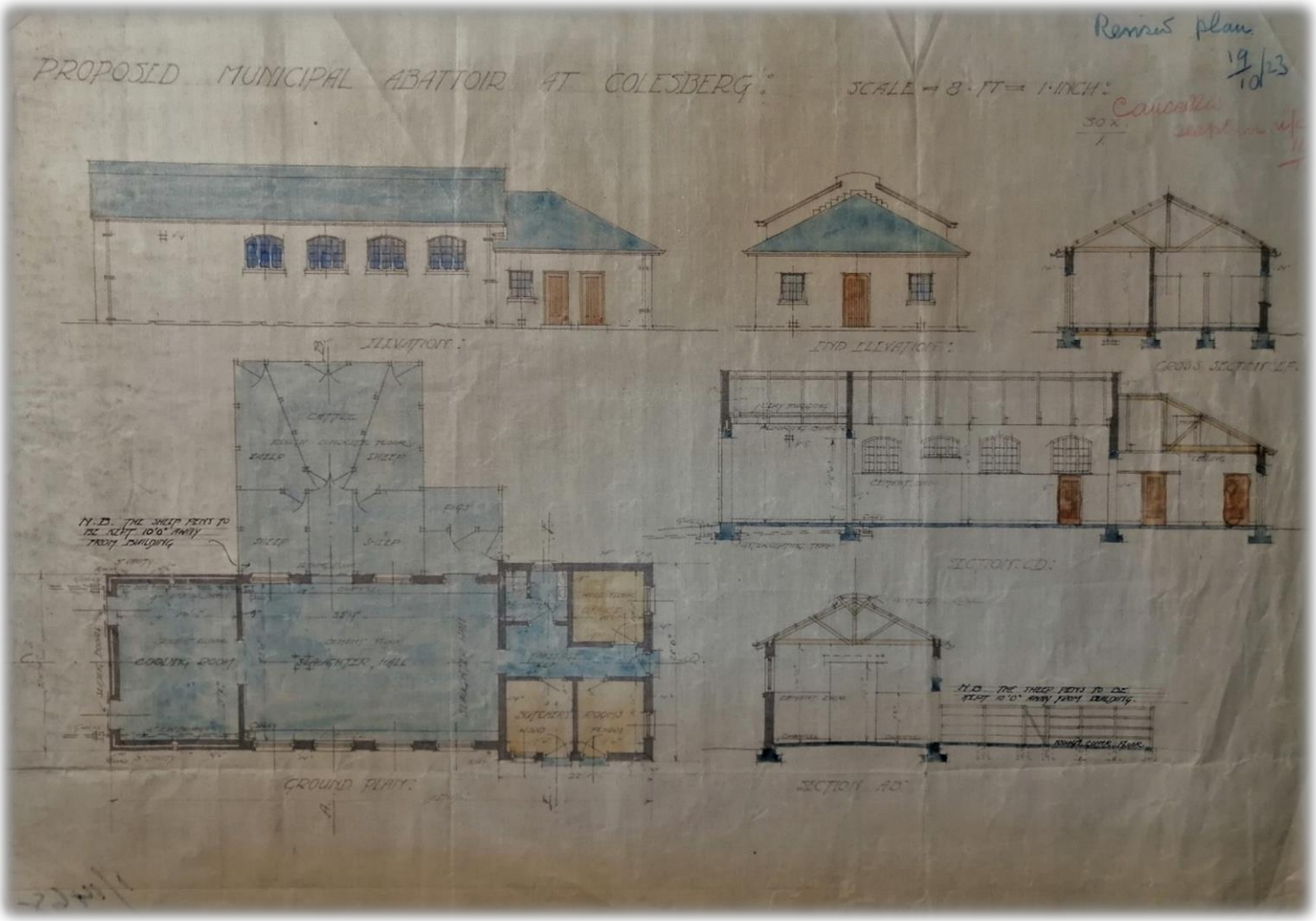
Source: CA, M3/959.

Image 4.10. Public slaughterhouse design, Oudtshoorn 1913



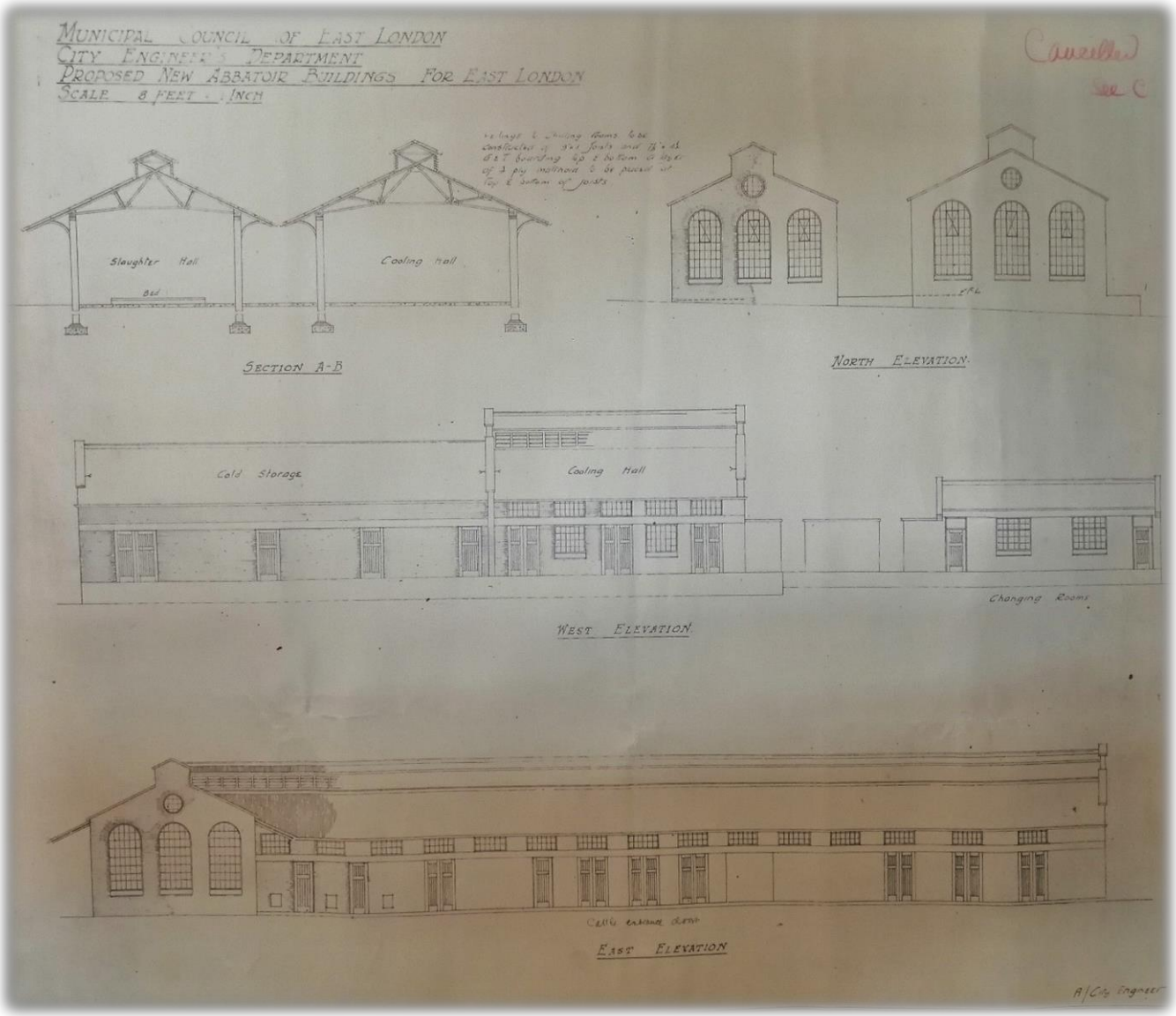
Source: CA, M2/2399-2400.

Image 4.11. Public slaughterhouse design, Colesberg 1923



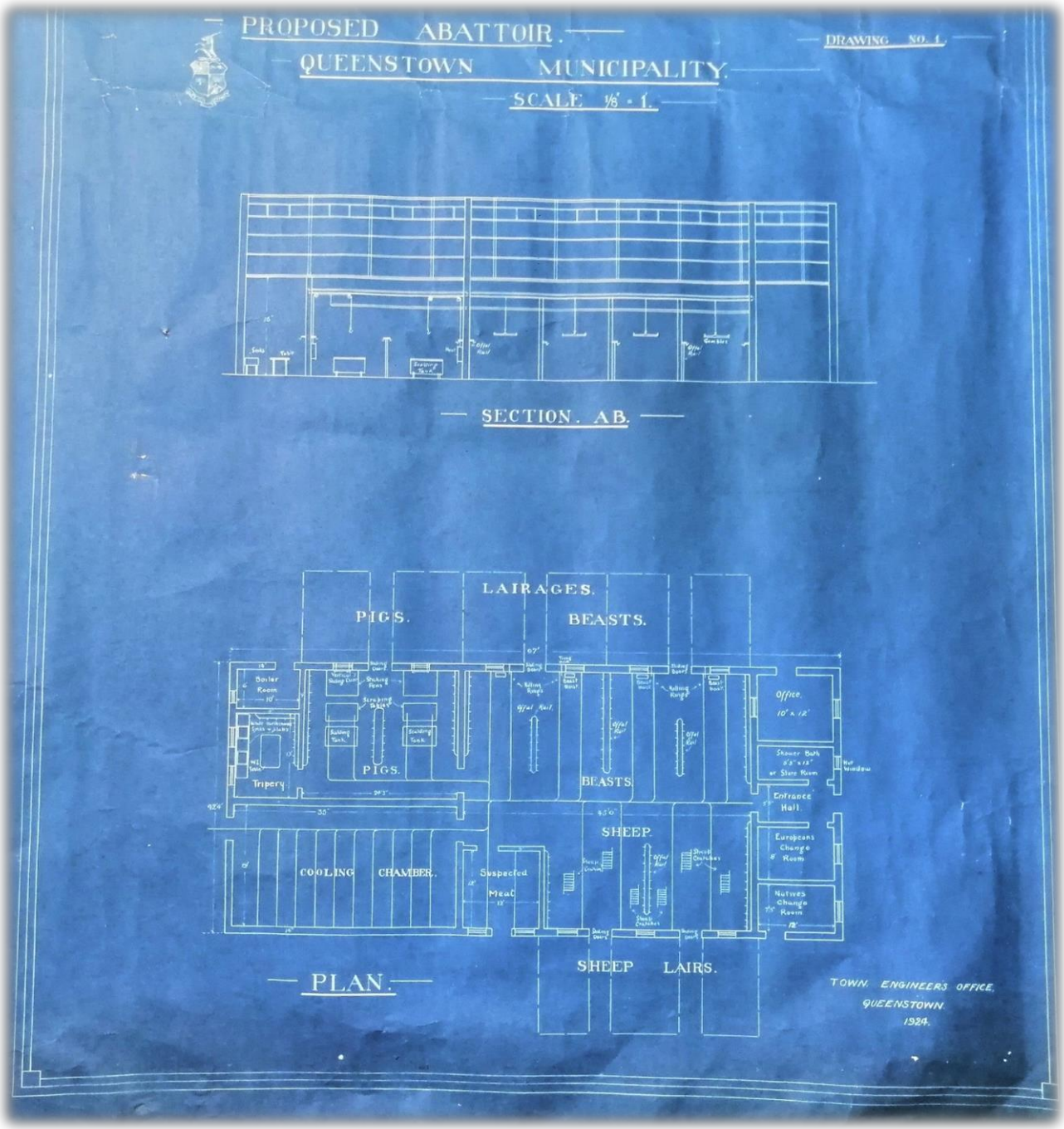
Source: CA, M1/1468.

Image 4.12. Public slaughterhouse design, East London 1925



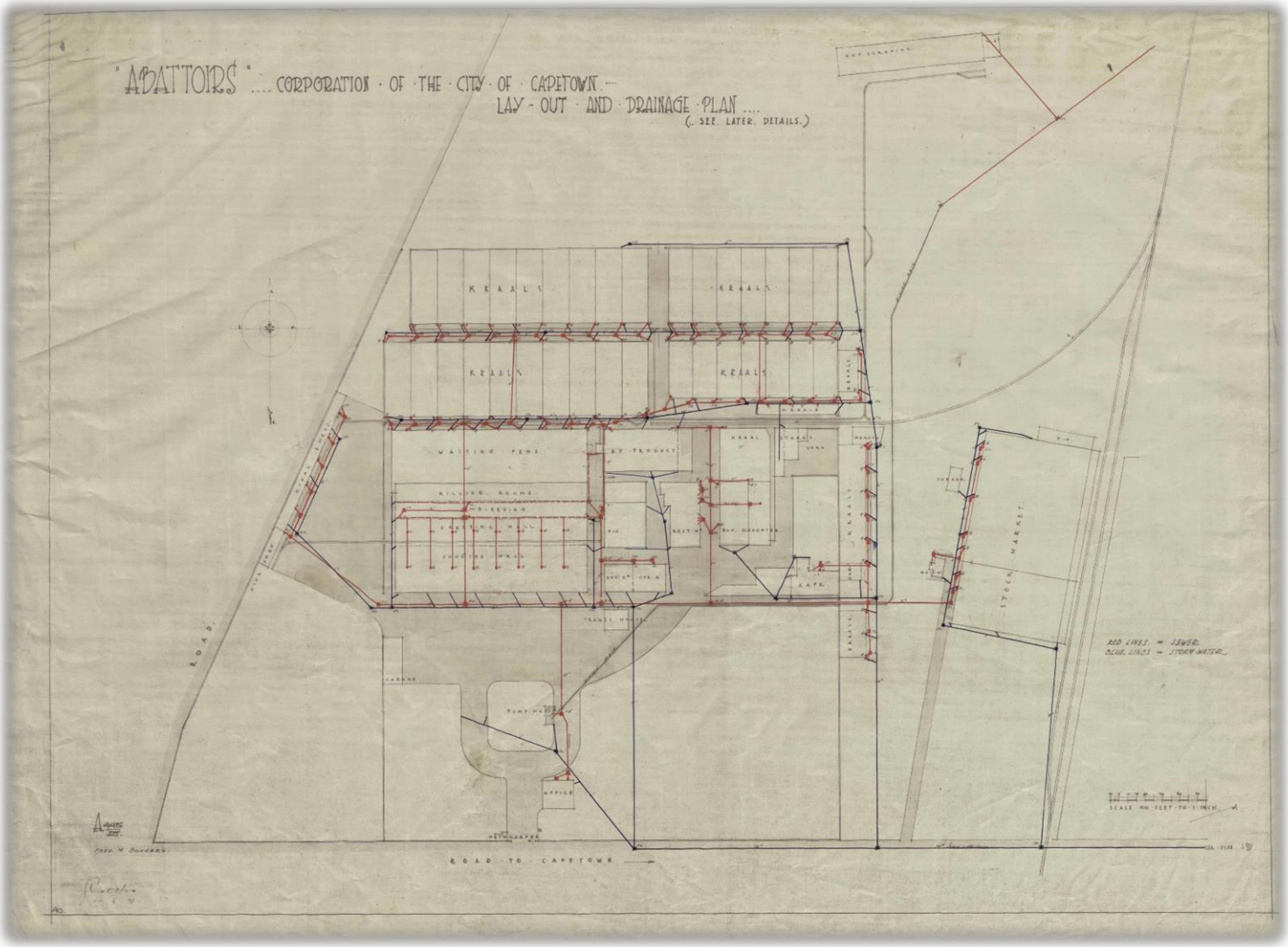
Source: CA, M3/3733.

Image 4.13. Public slaughterhouse design, Queenstown 1924



Source: CA, M2/2566.

Image 4.14. Public slaughterhouse design, Maitland 1928



Source: CA, M3/4561.

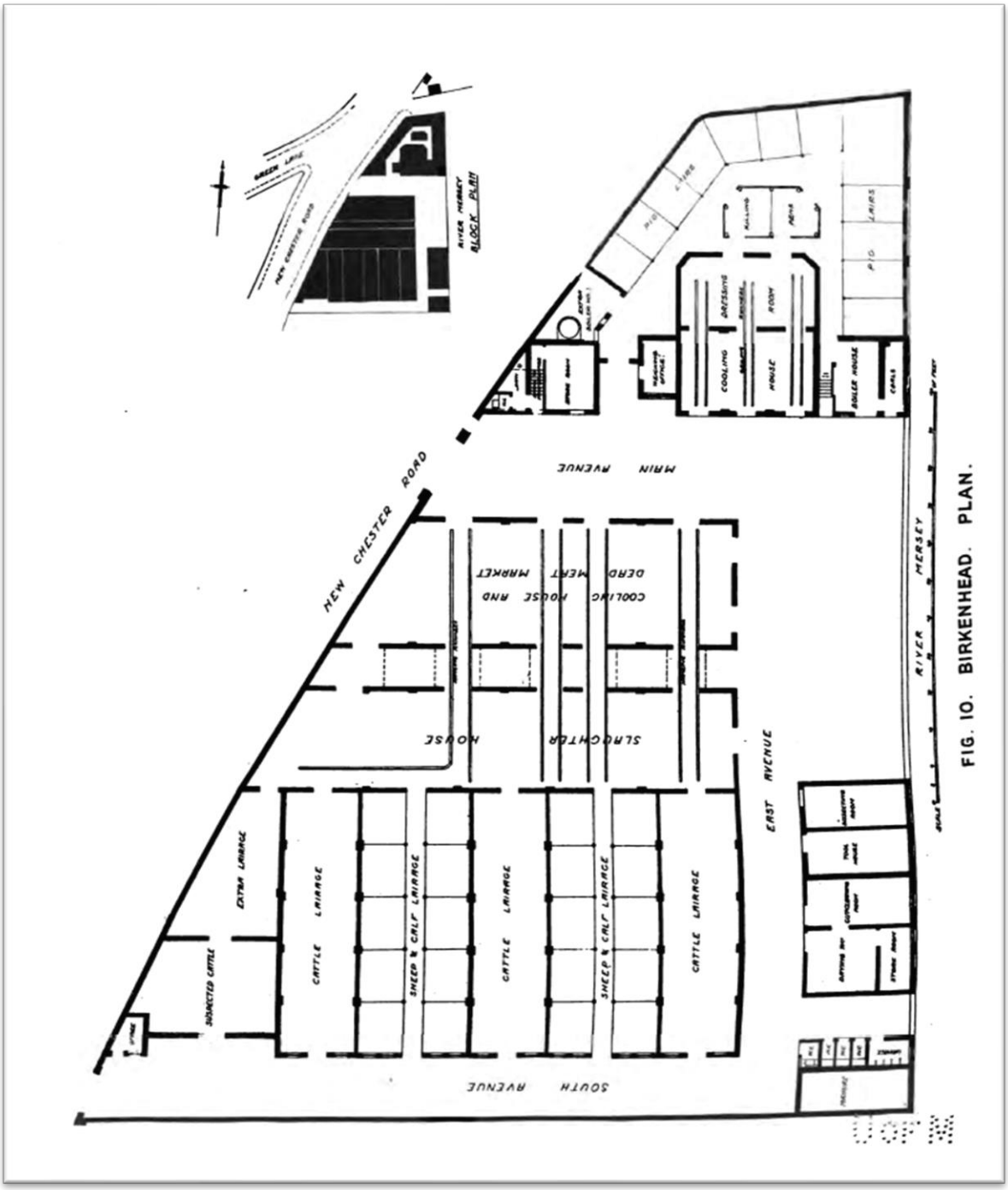
As can be observed in the above images, the exteriors of the buildings are drab and nondescript, unremarkable – like anonymous warehouses. This is reflected clearly in the designs of the Colesberg, Oudtshoorn, Queenstown and East London slaughterhouses. Second, there is what Chris Otter calls a 'directional logic', a kind of flow chart process, through which the animals passed.[195] They, the animals, began the process in the kraals, as breathing, moving, listening, smelling, feeling mammals. They had to pass through many gates and kraals on the journey to the slaughter halls. After that, by way of a winch, they were hoisted by their hocks onto hooks on overhead rails. In this way, they were conveyed to the

[195] Otter, 'Civilizing Slaughter', 39, 48.

dressing hall. Next, they were eviscerated, and then sawn or axed in two, lengthwise, and then conveyed to cooling chambers. They, cattle, went in as richly sentient subjects, they exited as cooled dismembered objects. That was and is the logic of an industrial slaughterhouse.

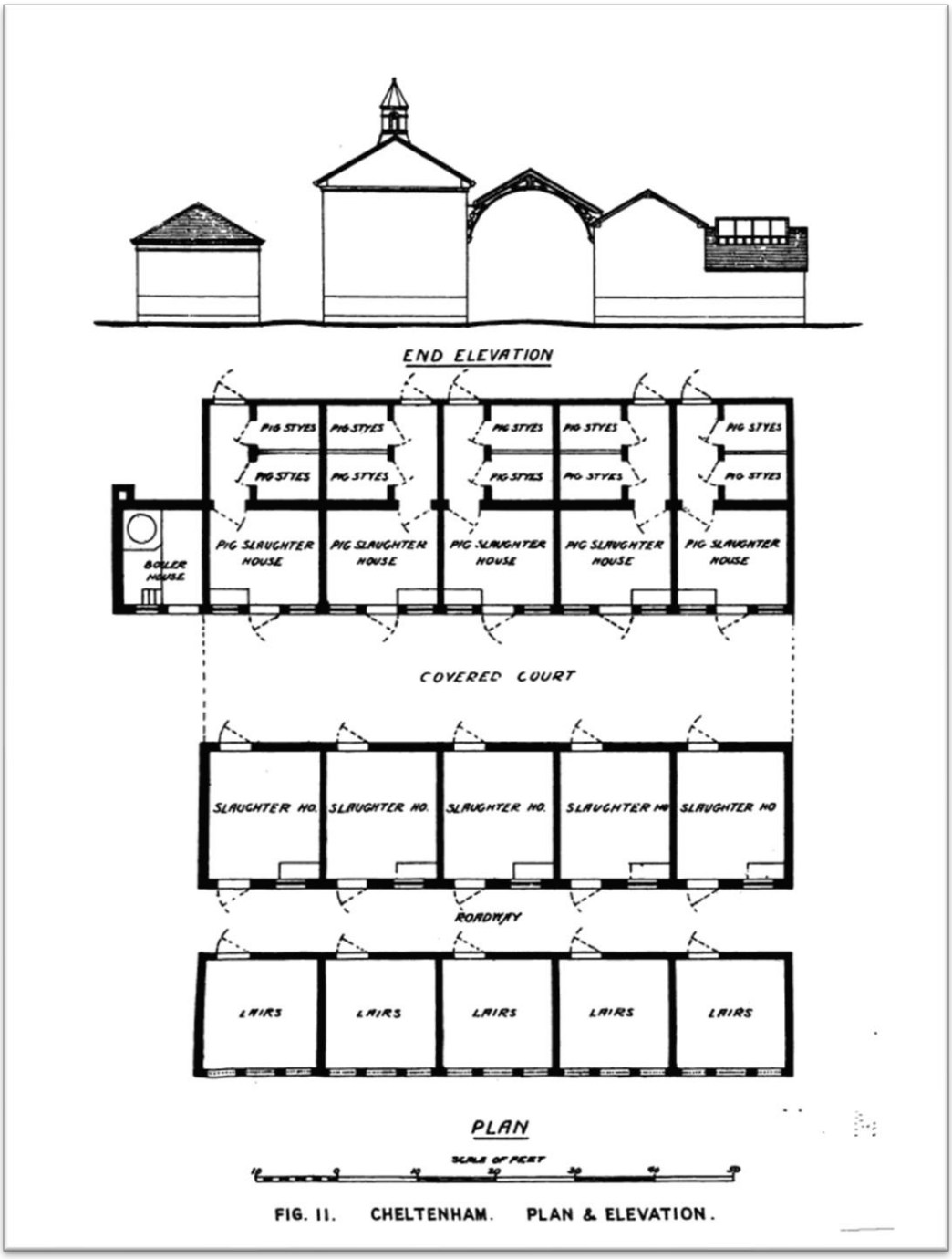
The Cape's early twentieth century public slaughterhouses, shown above, appear modelled on various British public slaughterhouses, shown below. The following two British slaughterhouses, a larger one in Birkenhead and a smaller one in Cheltenham, both from the late nineteenth century, indicate similarities to the Cape slaughterhouses.

Image 4.15. Birkenhead medium-sized public slaughterhouse, 1887



Source: Ayling, *Public Abattoirs: Their Planning, Design, and Equipment*, 55.

Image 4.16. Cheltenham small public slaughterhouse 1891



Source: Ayling, *Public Abattoirs: Their Planning, Design, and Equipment,* 67.

There are clear design commonalities between the Cape and British public slaughterhouses; Cheltenham's is similar to Queenstown, Outsdoorn, and Colesberg's, while Maitland's is similar to Birkenhead's. The slaughterhouses contain the following core features. There are kraals, corridors from kraals to slaughter halls, slaughter halls or killing floors, carcass dressing

rooms, suspension facilities, cooling chambers, and administrative blocks. In the section that follows, different features of public slaughterhouses are described in terms of their function. Where possible, investigative accounts of different steps in the process inform the descriptions. The objective is to use this method of description, paired with a recognition of cattle's mind and biology, to offer insights into cattle's likely historical experiences of public slaughterhouses.

Kraals, or lairs or lairages, are fenced or walled enclosures. These are annexes to the slaughter chambers, where animals wait. Cattle in kraals saw and heard and smelled their fellows and kin diminish in number. Cattle were moved from kraal to kraal by compulsion. A common method was securing a metal 'chain round the horns and dragging [cattle] to the ring in the floor to kill [them]'.[196] Otherwise, 'a good deal of striking with iron rods' so that cattle were compelled through the corridors to the killing floor, was deployed, as an investigation by the SPCA in the East London slaughterhouse exposed.[197] Extreme force was a constant variable in this process, since no animal willingly walked into a slaughter chamber. Cattle were dragged to slaughter halls, not by a solitary butcher, but by 'gangs' of slaughter men.[198]

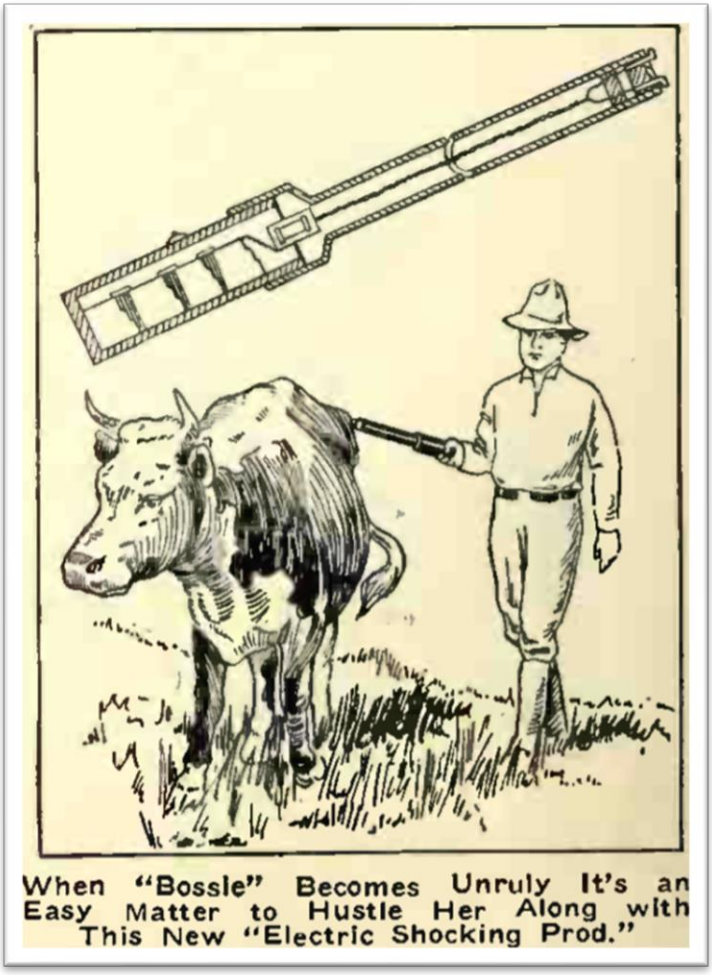
The Cape SPCA's 1917 report on investigations of the Maitland slaughterhouse, 'based on frequent visits' is illustrative. It noted that getting cattle to the slaughter hall involved 'dragging cattle through several gate-ways before finally getting them into [the] slaughter house' and that cattle confined at the end kraal on the west side 'have to be taken through no less than 5 gate-ways before finally arriving in the passage to the slaughter house.'[199] All of the designs above show multiple gates through which some animals would have to pass.
The manager of the slaughterhouses committee was no doubt uneasy about the method of dragging cattle to the slaughter halls. In response to a previous complaint by the SPCA, addressed to the town clerk, he wrote: 'If the Society would point out a better method of bringing animals into the kraals and killing bays, and a kinder method of killing them, they

[196] CA, 3/ELN. 259. Investigations at abattoir. SPCA inspector to SPCA secretary, 'Report re abattoir', 5 December 1922.
[197] Ibid.
[198] CA, 1/4/7/3/1/12. Markets and Slaughterhouses Committee (hereafter MSC) 1928 – 1931. Manager and veterinary officer to town clerk, 'Report on Die Burger article', 8 August 1931.
[199] CA, 3/CT vol. 4/1/3/6. SPCA secretary to town clerk, 'Secretary's report on municipal abattoirs', 8 February, 1918.

could rest assured of the hearty support of the Councils[’] employees’.[200] Five years later the SPCA would recommend the use of a captive bolt piston, as discussed below.

Records of the Maitland slaughterhouse income show that in 1931 ‘electric sticks’ were hired to slaughter men for £5 a month.[201] These were likely used to goad cattle by electric shock to the slaughter halls. At the time, these were not yet widely used in slaughterhouses in South Africa, but they had been patented and in use in Texan slaughterhouses from 1917, where their main use was ‘to hasten the movements of the cattle thru [sic] the abattoirs’.[202]

Image 4.17. Electric cattle prod, 1917



Source: ‘An Electric “Prod” for Animals’, *The Electrical Experimenter*, April 1917, 878.

[200] CA, 3/CT vol. 4/1/3/6. Maitland abattoir manager to town clerk, 18 September 1917.
[201] CA, 1/4/7/3/1/12. MSC. Comparative statement July 1931 & 1930.
[202] ‘An Electric “Prod” for Animals’, *The Electrical Experimenter*, April 1917, 878.

The caption is striking in that the cow's name 'Bossle' is used, which suggests a kind of familiarity with her. The word 'Unruly' betrays a victim-blaming mentality, in that it suggests that Bossle deserves to be shocked with an electric prod. The placement of the prod at Bossle's anus is likely not accidental, given the organ's preponderance of sensitive nerve endings. In Timothy Pachirat's ethnographic slaughterhouse investigations, he reported that electric cattle prods were used 'extensively', including 'sticking them under the animals' tails and into their anuses'.[203]

Animals in kraals were exposed to the smells and sounds which accompanied both compelled movement towards the slaughter hall and the slaughtering itself. As the Admiralty Commission into slaughterhouses noted with respect to British slaughterhouses, on which the Cape's public slaughter houses were modelled: 'there is no doubt that cattle especially, frequently show great reluctance to enter the slaughter chamber, and can only be dragged in by employment of considerable force'; the commission opined further that the 'presumption is that what they [cattle] chiefly object to is the smell of blood'.[204] Of course, cattle do not only have olfactory perception, they can also hear, see, and feel. Cattle heard the cries of their kin and fellows as they were beaten with rods, dragged by their chained horns, and pithed with spikes.

An East London resident wrote to the Town Clerk in 1922 to 'protest' the 'heart-rendering bellowing of cattle' he heard on Sunday mornings, which he found 'most distressing'. He further described the stench of 'putrid offal' being carted past his home as 'abominable'. He, the resident, recommended that the slaughterhouse be moved 'elsewhere', preferably 'as far away from the Town as possible'.[205] Whatever the resident's domicile proximity to the slaughterhouse was, it was not as close as the kraals outside the slaughterhouse, where the cattle waited. Thus, on the basis that cattle and humans share comparable auditory and olfactory capacities, we can reasonably infer that cattle heard the death cries of their kin or fellows, and smelled their entrails as they were carted away from the slaughterhouses.

[203] Pachirat, *Every Twelve Seconds*, 145.
[204] Ayling, *Public Abattoirs: Their Planning, Design, and Equipment*, 41.
[205] CA, 3/ELN. 259. Investigations at abattoir. W.B Magennis to town clerk, 're Abattoir', 6 December 1922.

Slaughter halls or killing floors are where cattle were killed. Humans who ate cattle and other animals did not like to see the animal's blood on the animal's flesh. Thus, as in previous private slaughterhouses or butchers' shops, a primary feature of a slaughter hall was exsanguination, or bleeding out. To do this a butcher's knife was inserted into the cattle's neck, and the carotid artery and jugular vein were sliced. These blood channels convey blood from the cattle's heart to their brain, face and neck, and from their brain, face, and neck to their heart, respectively. Severing these two channels with a knife thus allowed maximal blood to drain in the shortest time.

In the slaughter halls, cattle were restrained and then slaughtered. Three methods were used.[206] All involved slitting the cattle's throat, but one first involved stunning the cattle with a poleaxe or pithing lance, so that she was first rendered insensible, and then her main heart-linked artery and vein were severed.[207] The three methods used in the Cape slaughterhouses were the kosher method, the halal method, and what one might call the secular or non-ritual method.[208] The first, *shechitàh,* is slaughtering kosher mammals (ruminative ungulates) like sheep, goats, and cattle, via an incision that severs the animal's trachea, oesophagus, jugular arteries and carotid veins. It is performed using a *Chalaf* (*Shechitàh* knife) by slaughterers of the Jewish faith (shochet). Animals are to be fully conscious during this process.[209] No stunning is permitted. There is variation in halal slaughter methods across different times and regions, and different scholars and religious officials have disagreed about the exact nature of how halal slaughter should be conducted.[210] In the Maitland slaughterhouse, the interpretation was that the animals were not to be stunned or rendered insensible prior to slaughter, meaning that their throats were slit while fully conscious.[211] Indeed up until 1928 some 80% of animals slaughtered at Maitland were permitted to be slaughtered via the halal method of killing the animal while conscious.[212] The non-ritual method involved rendering the animal

[206] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Slaughtering operations February 1931, 3 March 1931.
[207] CA, 3/CT vol. 4/1/3/6. Secretary for Agriculture to town clerk, 17 November 1917.
[208] See CA, CSC 2/1/1/213, Colonel Crease, vs. Town Council of Cape Town, 15 June 1883; CA, 3/CT vol. 4/1/3/6. SPCA Secretary of SPCA to town clerk, 8 February 1918; CA, 1/4/7/3/1/10 MSC index 1926 – 1927: Meeting of 6 April 1926, 1–2. The term used in these materials for the non-ritual method is 'Christian'.
[209] G. Bozzo *et al*., 'Kosher Slaughter Paradigms: Evaluation of Slaughterhouse Inspection Procedures', *Meat Science* 128 (2017), 30.
[210] F. Armonios and E. Boğaç, *Halal Food: A History* (New York: Oxford University Press, 2018), 63.
[211] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Minutes: slaughtering of animals, 12 February 1929, 55.
[212] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Memorandum of interview between Mayor, Councillors and Mohammedan butchers, 5 June 1929.

unconscious before the throat slitting. The reason was that while unconscious and insensate, the animal's heart could still beat and thus their blood could be drained.

A 1917 SPCA investigation into the Maitland slaughterhouse included a description of the kosher method, and described an observed case where 'an ox was kept for 25 minutes tied down with its [sic] head strained back and its [sic] legs in the air' before having his throat slit.[213] In response to the town clerk, regarding the SPCA investigation, the Maitland municipal slaughterhouse manager noted that all except two butchers used the kosher or halal method.[214] The two butchers who rendered the animals insensible before slitting their throats, unable to acquire 'humane killer' ammunition, used the 'pithing' method.[215] Pithing is a process whereby an animal is rendered insensible or immobile by thrusting a javelin or spike through the back animal's skull above their neck and into their brain.

No less than the Secretary for Agriculture received the SPCA's investigative report, and wrote to the town clerk, noting that:

> the manner in which the slaughtering of cattle is carried out in some of the abattoirs leaves much to be desired. It seems to be the unanimous opinion that the most humane method of slaughtering cattle is by means of "pithing", provided the "pither" is an expert. Unfortunately, however, from reports to hand it is evident that in a large number of cases the man employed to do the "pithing" is anything but expert, with the result that a great deal of unnecessary cruelty is practiced.[216]

The Maitland slaughterhouse manager himself wrote to the Town Clerk requesting a regulation to be issued stating:

> That all animals being slaughtered for export must be stunned, either by pole axe, humane killer, or pithing, prior to having their throats cut.[217]

[213] CA, 3/CT vol. 4/1/3/6. SPCA chairman to town clerk, 17 November 1917, 2.
[214] CA, 3/CT vol. 4/1/3/6. Maitland abattoir manager to town clerk, 'Letter from SPCA', 18 September 1917.
[215] Ibid.
[216] CA, 3/CT vol. 4/1/3/6. Secretary for Agriculture to town clerk, 17 November 1917.
[217] CA, 3/CT vol. 4/1/3/6. Maitland abattoir manager to town clerk, 'Alleged cruelty to animals', 3 December 1917.

'Pithing', he continued, 'not only requires an expert hand but a layout different to that here, e.g., that animals should be driven, not dragged, into the enclosure…and the pither, armed with a long lance, should be on a platform above them'.[218]

The Cape of Good Hope SPCA first supplied slaughterhouses in Cape Town with 'humane killers', a type of captive bolt pistol, in 1923.[219] In 1928 on 1 August there was a demonstration of a new 'mechanical killer' at the Maitland slaughterhouse.[220]

In all cases the animals were bled to death. There is some debate about how long cattle take to die from exsanguination. Where the heart-linked veins and arteries are partially severed, brain death can take minutes, and animals drown rather than lose heart-or brain function. For cattle, in twenty-first century Swedish slaughterhouses cardiac arrest from exsanguination takes an average of five minutes and 45 seconds.[221]

Thereafter cattle were dressed. Skinning cattle while their bodies were strung up onto overhead conveyor rails likely only began in the 1950s, when patents for this method appeared in the United States.[222] Before, cattle were likely skinned on skinning crates, and may have been hoisted onto overhead rails for evisceration. To hoist cattle, an incision is made between the large tendon and the bone above the hock.[223]

We know that cattle were dressed and eviscerated in the Cape slaughterhouses because each map shown above has dressing halls. The exact method of dressing is unknown but sources from elsewhere in the early twentieth century can offer insight into how the process likely occurred.[224]

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[218] Ibid. For a late eighteenth century description of pithing in the Cape, see R. Percival, *An Account of the Cape of Good Hope* (London: C. and R. Baldwin, 1804), 262–263.
[219] Cape Town SPCA Archives, 'Centenary Brochure, landmarks', 1972.
[220] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Town clerk to chairman of Markets and Slaughterhouses Committee, 28 July 1928.
[221] J. Jerlström, 'When and What Determines the Death of an Animal? A Study Investigating the Heart Activity during Slaughter of Farm Animals' (Veterinary Medicine Thesis, Swedish University of Agricultural Science, Skara, 2014), 3.
[222] L. Force, G. Moore, and W. Hincks, Process for dressing beef cattle and the like, US Patent 2, 640, 225, issued June 2, 1953.
[223] H. Smith, 'Circular no. 81 - Beef Slaughtering, Cutting, and Curing', *UAES Circulars* 69 (1929), 9.
[224] W. Major, *Practical Butchering: How to Make It Pay* (Kent: William Henry Major, 1900), 68, 111.

Dressing cattle is an integral part of public slaughterhouses' processes.[225] Because it discloses no hint of what the process involves, the term 'dressing' is a concealment and a euphemism. Speculatively, dressing involved some variation of the following aspects.[226] From a cattle perspective, what occurred in these slaughterhouses, deserves to be remembered.

Dressing includes flaying or dehiding, whereby the animal's skin is removed from their body. The cattle's head is usually flayed first, by making an incision from the cattle's poll, behind their ears, down the front of their head, down the centre of their nose, and then down to their mouth, where the incision ends. Another incision is made from the centre of the base of their neck to the centre of their lower jaw. The cattle's head skin is then pulled off. The atlantooccipital joint is then severed, which separates the cattle's head from their body. This is decapitation. Next, an incision is made at the base of the cattle's neck, along their brisket, or breast, along their belly, to the base of their tail. The cattle's fore and hind legs are slit from the knee joints upwards. The cattle's skin is pulled from their limbs, belly, breast, and neck. At some point, the tail is cut off.

After the cattle have been flayed, they are eviscerated. Evisceration means the removal of internal organs, when a deep circle is cut around the cattle's anus and the large intestines are pulled out. On the animal's underbelly, a deep cut is made from the middle of the pubic symphysis to the animal's sternum. Abdominal organs are then pulled out. A cut is made from the sternum to the middle of the cattle's neck, after which diaphragmatic and thoracic organs are removed, including the animal's larynx, trachea, liver, lungs and non-beating heart.

With a saw or an axe, next, the cattle's body is split down the middle into two halves from the cattle's pelvis up to her neck. The cattle's carcass is then sprayed with water, washed, and then dried. After dressing, cattle carcasses were moved to the cooling chamber via an overhead trolley to which their hocks were connected. Here they were kept for days before they were taken away to markets, and replaced by the next batch of cold cattle carcasses.

[225] Schwarz, *Public Abattoirs and Cattle Markets*, 78, 427; Grantham, *A Treatise on the Public Slaughter-Houses*, 48, 52; Ayling, *Public Abattoirs: Their Planning, Design, and Equipment*, 19, 45, 57–58, 7, 85, 92.
[226] Smith, 'Circular no. 81 - Beef Slaughtering, Cutting, and Curing', 8–9.

Some historical sources offer insights into the different aspects of the Maitland slaughterhouse. The next major investigation into the Maitland slaughterhouse was published in the Afrikaans newspaper *Die Burger* in 1931 in an expose based on a 'thorough investigation' entitled 'Verskrikleke Wantoestand in Kaapstad se Slagpale', translated as 'Terrible misery in Cape Town's Abattoirs'.[227] Parts of it are described here because it offers some insight into cattle experiences in the early 1930s. *Die Burger* journalists revealed that when they saw cattle arrive via rail cars from South West Africa, cattle who had been travelling for 'at least six days' were 'lean' from 'the hardships suffered along the way'.[228] It is plausible therefore, the authors implied, that the cattle had lost weight from stress and/or inadequate food and water. Of the 44 kraals, 20 had roofs, and 12 were equipped with some food.[229]

When the journalists asked when the cattle would be slaughtered, they were informed that the first opportunity would arise in perhaps four days' time. In the kraals, the cattle were cramped together 'like sardines in a tin'.[230] Sometimes the cattle were unable to eat because the kraals were too overcrowded. Sheep and cattle were often unable to move at all. Most sheep could drink no water. Some sheep had fallen into the water troughs and died there. There were about 400 cattle and two thousand sheep, 'and one can see that the poor animals are almost dead from thirst but cannot drink'.[231] 'There is no food to speak of', they persisted, 'apart from a few kraals with food troughs, but even there the food shortage is hopeless.'[232] In summary, animals in transit and the kraals were intensively cramped, and hungry and thirsty to the extent that some died. These findings were corroborated by the Animal Welfare Society of South Africa (AWSSA).[233]

The journalists did not discuss 'the actual slaughter… except to say that the system cannot handle slaughtering more than 2 000 sheep per day and a few hundred cattle'.[234] In the

[227] 'Verskrikleke wantoestand in Kaapstad se slagpale'. *Die Burger*. 13 June 1931. Author translation.
[228] *Ibid*.
[229] *Ibid*.
[230] *Ibid*.
[231] *Ibid*.
[232] *Ibid*.
[233] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Minutes, 6 June 1931.
[234] 'Kaapstad se slagpale'. *Die Burger*, 1931.

previous month 30 000 sheep and 4 000 cattle were slaughtered, or 2.24 animals per minute at 31, eight-hour working days. Of the dressing hall, they wrote '[e]verywhere you go, it is dirty and horrible'.[235] The cooling halls were 'filthy', butchers' aprons had probably never been washed, and were grease-black, and there were 'millions of flies.' Animals' hinds were thrown over workers' shoulders and carried from one place to another. They noted that: 'If the Cape Town housewives visited these slaughterhouses, they would probably never eat meat again'.[236] The following week *Die Burger* published a follow-up article that quoted Mr Wolfe Davis of Imperial Cold Storage saying that the expose was 'totally true'.[237]

Two months later the Acting Secretary for Public Health requested a full report on the allegations that conditions were 'extremely unsanitary and inhumane' and that 'buildings and pens were entirely inadequate'.[238] The manager and veterinary officer penned a response report, largely downplaying the expose but providing some details relevant to our purposes. On average four trains arrived daily with 200 cattle and 1 000 sheep. Kraals were 'as clean as possible' and water troughs cleaned 'twice weekly'. Insufficient kraal accommodation occurred 'periodically'.[239] He closed by noting that he would welcome a thorough investigation by a public health official.[240] In this way health, veterinary and agricultural departments were all connected to this issue.

In 1933 a remarkable newspaper article offered an extremely rare, descriptive account of the methods of slaughter across South Africa at the time.[241] Mr N. Harris addressed an audience, mostly comprised of women, the newspaper noted, at the SPCA's annual general meeting. He noted that most of the SPCA's work had been done by women 'as the men were no good for this sort of job'. The participation of women coheres with RSPCA work done in Britain from the early nineteenth to the mid-twentieth century, whose prominent patronesses and leaders and toiling rank and file members, despite initial prejudice against them, were often women

[235] *Ibid*.
[236] *Ibid*.
[237] 'Stedelike slagpale'. *Die Burger*. 16 June 1931.
[238] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Minutes, 11 August 1931.
[239] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Manager and veterinary officer to town clerk, 'Report on Die Burger article', 8 August 1931.
[240] Ibid.
[241] 'Horrors of the Abattoirs: Mr Harris addresses Uitenhage SPCA, humane shooting pens must be introduced', *Eastern Province Herald*, 18 April, 1933.

who were moved by the plight of animals.[242] Mr Harris' topic was slaughter methods at slaughterhouses, and was informed by SPCA investigations in Johannesburg, Pretoria, East London, Durban, and Port Elizabeth.[243] He noted that the predominant method of compelling cattle into slaughter hall was via 'lashing' and 'dragging by steel chains' on the 'final torturing drag' to the 'ring bolted floor' of the slaughter halls. He had seen slaughter men take 'ten minutes to slaughter an ox, which [sic] was dragged inch by inch, with chains round its [sic] horns, boys [sic] tugging and others goading, through a spectacle of blood before it was dragged down to the iron ring and killed in front of the eyes of the beasts going to be killed afterwards.'[244] He offered an extremely rare description of the pithing system, noting that 'the slaughter man drove his javelin… into a bullock's neck just below the brain.'

The process involved a large horned mammal in a state of foreboding and acute distress being forced to hold still while a javelin was aimed at her cerebellum. It was unlikely that the pither would be able to perfectly aim and then thrust his javelin into her hindbrain, on his first attempt. Little wonder that the AWSSA would later refer to pithing and poleaxing as the 'old hit-or-miss' method.[245] 'Frequently,' he persisted, 'several animals were killed at once by this method and after the first beast was dispatched there was a frantic effort on the part of the remaining animals to escape'.[246] As regards religious slaughter methods he noted that it 'involved all the hounding and dragging' and 'sometimes it took ten minutes to bring a beast to its [sic] death.' He spoke further of the kraals and passages to slaughter halls being like a type of 'Chinese puzzle' through which cattle were dragged and that they, cattle, frequently charged at the iron railings.[247] The picture from cattle's perspectives is one of confusion, disorientation, contagious fear, heavy beatings, chained horns, and javelins thrust at moving cerebellums.

Legislation sought to circumscribe some of these methods and practices. The next major shift in slaughterhouse development, from a cattle perspective, occurred with the passing of the

[242] A. Moss, *Valiant Crusade: The history of the RSPCA* (Cassell: London, 1961). 24, 29, 36–37, 43,44.
[243] 'Horrors of the Abattoirs', *Eastern Province Herald*, 1933.
[244] *Ibid*.
[245] The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs: With Special Reference to the Slaughter of Animals Act, 1934* (Cape Town: Cape Times Limited, 1934), 10.
[246] 'Horrors of the Abattoirs', *Eastern Province Herald*, 1933.
[247] *Ibid*.

national Animal Slaughter Act of 1934, and the South African Animal Welfare Society's publication of a Model Abattoir Design brochure to accompany the new Act's prescriptions.
As early as 1915 the SPCA started to pressurise the slaughterhouse committee in Cape Town to change animal slaughter methods and how animals were treated.[248] For the next two decades, various groups exerted further pressure on local authorities because they were moved by what they recognised as cruel treatments of animals in slaughterhouses. Even a cohort of five butchers in East London wrote to the mayor and councillors requesting that their slaughterhouse be redesigned and built so that they could butcher animals under 'humane and hygienic conditions'.[249] By 1926 the Cape Provincial secretary approved Slaughterhouse Regulation no. 233 with clauses stating vaguely and loosely that animals should be 'securely fastened, so as to enable such animal to be felled with as little pain or suffering as practicable' and that 'slaughtering… instruments and appliances' should be chosen to inflict as 'little pain and suffering as practicable'.[250]

No efforts for regulating animal slaughter and diminishing the individual harms animals endured during slaughter in South Africa were as impactful as one woman's, Edith Muriel Anderson. Edith Anderson lived in South Africa for six months in 1928, when her husband, who was vice-admiral of the British Royal Navy, was stationed as Britain's high commissioner to South Africa.[251] While in South Africa Edith Anderson started the Animal Welfare Society of South Africa.[252] In 1934, at least 15 of the society's 39-member council were women.[253] Its patrons comprised a diverse group, including the Mayor of Cape Town, the Moderator of the Dutch Reformed Church, Earls and Countesses from Britain, the Royal Australian Navy's vice-admiral, and a bishop.[254] It seems plausible that on some level, emotions may have played a role in driving such people to lobby for legal changes to less violent slaughter practices.

[248] CA, 1/4/7/3/1/2 MSC 1915 – 1916. Minutes, 16 August 1916.
[249] CA, 3/ELN. 259. Investigations at abattoir. East London butchers to Mayor. 14 February 1923.
[250] CA, 1/4/7/3/1/10 MSC index 1926 – 1927. Minutes, 14 December 1926.
[251] D. Clune, 'Anderson, Sir David Murray', in D. Clune and K. Turner (eds.), *The Governors of New South Wales, 1788- 2010* (Sydney: The Federation Press, 2009), 507.
[252] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Chairman of slaughterhouse committee to slaughterhouse committee, 19 March 1931. Compare this claim to Animal Welfare Society of South Africa, *Special Edition, 90 Years, 1929 to 2019* (Cape Town, 2019), 4, which dates the Society's beginning from 1929.
[253] The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs: With Special Reference to the Slaughter of Animals Act, 1934* (Cape Times Limited: Cape Town, 1934).
[254] *Ibid*.

Edith Anderson was aggrieved at the suffering animals experienced during slaughter, and lobbied for a law to make mechanical killer use compulsory in South African slaughterhouses, so that animals would be rendered insensible before being exsanguinated. At a Joint Slaughterhouses Committee meeting, the chairman described her efforts as a 'tremendous agitation'.[255] The AWSSA, under Edith Anderson, he said, urged the use of 'mechanical killers for every form of slaughtering'.[256] Legislation was drafted to the effect that slaughtermen had to apply for certificates if they wanted to be exempted from using mechanical killers. It was gazetted on 28 September 1928 as Government Notice no. 417 1928.[257] Thereafter, certificates had to be acquired to slaughter according to religious rites. 80% of animals were killed via the non-stunning Mohammedan method in the Cape in 1928.[258] In February 1930, of the 3 070 animals slaughtered at Maitland, 15.12% were slaughtered by the Halal method, 16.71% were Kosher, 2.93% were Kosher Treif, and 65.24% were slaughtered by a mechanical killer.[259]

In 1930 there were 1 326 186 cattle in the Cape province.[260] 18 874 cattle were slaughtered in the Cape in 1930.[261] Assuming that the cattle slaughtered in the Cape in 1930 were slaughtered by mechanical killer at the same proportion as those slaughtered at Maitland (65.24%), implies that in 1930 alone Edith Anderson's intervention would have affected the slaughter experiences of 12 313 cattle in the Cape.[262] Assuming further that from cattle's perspectives it is experientially preferable to be rendered insensible by a mechanical killer, the collective qualitative shift for cattle's experiences of slaughter was considerable.

Achieved in less than six months, Edith Anderson's institutionalised animal welfare impact regarding slaughter methods was at this point likely the most significant of at least the past 277 years. Her friends in London paid 'tribute to the social genius and delightful personality

[255] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Chairman of slaughterhouse committee to slaughterhouse committee, 19 March 1931.
[256] Ibid.
[257] Ibid.
[258] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Memorandum of interview between Mayor, Councillors and Mohammedan butchers, 5 June 1929.
[259] CA, 1/4/7/3/1/12. Chairman to slaughterhouse committee, 19 March 1931.
[260] Union of South Africa, *Report of the Agricultural and Pastoral Production* (Pretoria: Government Printers, 1930), 51.
[261] *Ibid*, 64.
[262] 18 874 ÷ 100 x 65.24 = 12 313.

of Lady Anderson, who [gave] her energy and enthusiasm lavishly in social welfare work.'[263] No secondary sources mention her contributions to animal welfare in South Africa.

For individual cattle, the law may well have improved their experiences of slaughterhouses to some extent. But there is a tragic irony in that acting to improve animals' welfare, the AWSSA had to design and promote mass slaughter equipment. Temple Grandin is perhaps the person who has done the most to alter slaughterhouse designs to reduce the extent of anxiety and injuries for animals. Her contributions included designing curved cattle corrals, diagonal pens, and slaughterhouse welfare metrics. She designed a third of all the 'livestock-handling facilities' in the United States by the early twenty-first century, and published over 60 texts related to animal behaviour.[264] The 2010 'Times 100' list distinguished her as one of the most influential people in the world, and listed her in the 'Heroes' category.[265] Temple Grandin revealed the deep irony of compassion-driven slaughterhouse design when she once noted that:

> People always wonder how I can work in meatpacking when I love animals so much. I've thought about this a lot. After I developed my center-track restraining system, I remember looking out over the cattle yard at the hundreds and hundreds of animals milling around in their corrals. I was upset that I had just designed a really efficient slaughter plant. Cows are the animals I love best.[266]

It does seem hard to reconcile a conception of love that is compatible with mass slaughter design. And yet, while normalising mass slaughter, for individual cattle there were arguably some experiential improvements. At an abstract level, there may have been a different impact for cattle as individuals and cattle as a group. As a group, more efficient mechanical killing can enable an upscaling of slaughter capacity and thus increase the number of cattle killed. For example, whereas 653 804 cattle were slaughtered in South Africa 1939, 1 178 215 cattle were slaughtered in 1950.[267] During the same period, the number of pigs slaughtered increased from 286 864 to 820 606, while the number of sheep slaughtered peaked at

[263] *The Sydney Morning Herald*, 6 November 1935.
[264] C. Wolfe, *What Is Posthumanism?* (Minneapolis: University of Minnesota Press, 2010), 128.
[265] M. Hauser, 'Temple Grandin', *Time*, 29 April, 2010.
[266] T. Grandin and C. Johnson, *Animals in Translation: Using the Mysteries of Autism to Decode Animal Behaviour* (New York: Scribner, 2005), 307.
[267] Meat Industries Control Board, *Annual Report Livestock and Meat Industries Control Board 1951*, 1.

4 622 989 in 1942.[268] The claim is not that the improved slaughter designs alone increased the rate of slaughter in South Africa but rather that increased slaughter capacities occurred in wake of the new slaughter methods.

The AWSSA visited the mayor of Cape Town and the chairman of the Slaughterhouses Committee in 1930.[269] They lobbied for animals to be driven in single file to the slaughter halls. They lobbied for better food and water for animals waiting in kraals (before *Die Burger* expose). They argued for the compulsory 'humane' casting pens (cattle crushes) where animals would be stunned pre-slaughter, pens, they argued, that were in use in London and Birkenhead. The AWSSA also monitored closely the percentage of animals killed by the various methods.[270]

A new more developed Humane Animal Slaughter Bill was drafted and went through various readings and amendments in the House of Assembly (lower parliament) and Senate (upper house of parliament) over the next six years.[271] In 1931, after a reading by Senate, the word 'humane' was dropped.[272] Perhaps the word humane, with denotations of compassion and benevolence was logically regarded as incompatible with animal slaughter, mechanical killer or no. By 1934 a law regulating the slaughter of animals was passed in the national Senate, entitled 'Act to Provide for the method of slaughter of certain animals and for matters relating thereto, no.26, 1934'.[273] The Act aimed to reduce two main forms of cruelty. First, the pithing and poleaxing methods of stunning animals, which relied on human 'muscular energy' and, second, dragging cattle to a ring fixed to the slaughterhouse floor, to which they were then chained pre-slaughter.[274]

The Act blocked any animal slaughter which depended on 'human muscular energy', so that mechanical killers (depicted below) became prescribed. This meant that pithing and poleaxing

[268] Ibid.
[269] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Minutes, 11 March 1930.
[270] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Minutes, 10 February 1931.
[271] CA, 1/4/7/3/1/12. MSC 1928 – 1931.
[272] CA, 1/4/7/3/1/12. MSC 1928 – 1931. Minutes, 9 June 1931.
[273] Union of South Africa, *Slaughter of Animals Act, no. 26, 1934*, (1934).
[274] Union of South Africa, *Slaughter of Animals Act, no. 26, 1934*; The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs*, 1–2.

was no longer permitted. Further, all slaughterhouses that killed more than fifty bovines per month had to ensure that animals were killed in a 'casting pen' (depicted below), i.e., not while being chained or tied to a bolt in the floor, and that animals had to be driven in a single file to the killing pen via a 'race'. Certificates to kill animals without stunning, as per religious rites, had to be acquired from local authorities. Slaughterhouses using such methods and where more than fifty animals were killed in a month, had to be killed in a casting pen or a stunning pen.

In the same year, the AWSS published a brochure *Humane slaughter and model abattoirs: with special reference to the Slaughter of Animals Act, 1934* (1934) illustrating and advertising different mechanical killers and different casting pens, as well as large and small 'model' slaughterhouse designs. Their aim was to inform the design of new slaughterhouses and adjustments to extant ones to comply with the new regulation.

Image 4.18. Mechanical killers and illustrated killing pens

Source: The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs: With Special Reference to the Slaughter of Animals Act, 1934* (Cape Town: Cape Times Limited, 1934), 11.

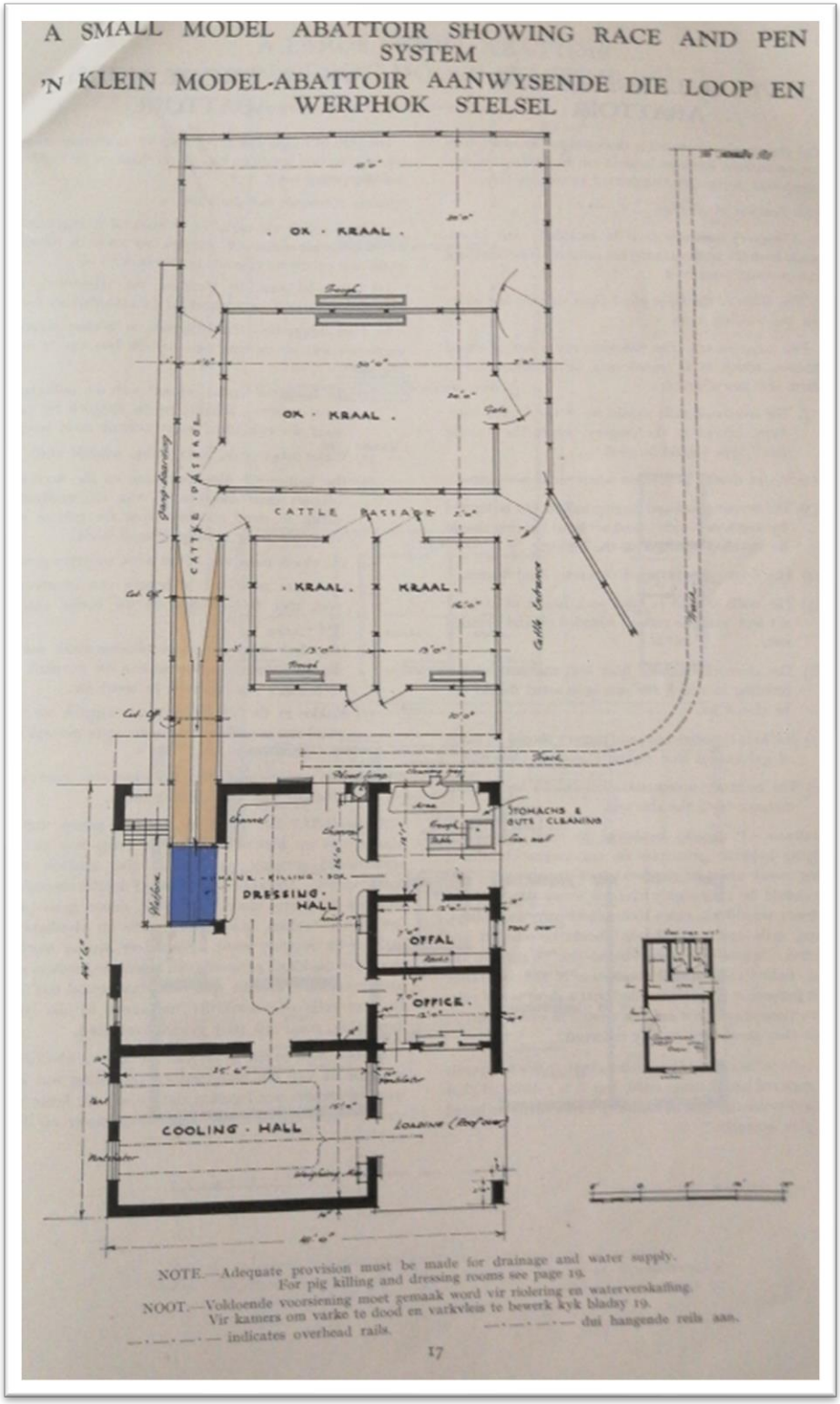
The image above shows four different mechanical killers that the AWSSA recommended so that slaughter men could abide by the law's injunction to kill without human muscle power.

These instruments were available in main cities across the country. The image of the cattle head depicts where on cattle's heads the mechanical killer should aim to destroy consciousness. The bottom, model depiction, shows the 'race'. The race is the long column running from left to right across which cattle were compelled to proceed in single file towards the casting pen. The object of the casting pen, or cattle crush, was to trap the cattle so that they could be stunned while standing upright, by means of the mechanical killer, as the AWSSA put it 'instead of having its [sic] head forcibly dragged down to a ring in the blood-soaked floor of the slaughter hall'.[275]

The AWSSA was naively optimistic about the function of the casting pen and its impact on cattle welfare. They imagined that once in the pen 'confined in a small space and unaware of its fate, the animal stands quietly'.[276] But of course those in the race could still hear the bang of the mechanical killer and the loud thud as their kin and/or fellows in the line before they collapsed onto the floor. We now know that cattle communicate emotional valences to each other with vocalisations and can perceive stress in each other's urine, stress which functions as an emotional contagion. Especially when paired with captive bolt pistol stunning, there is scant reasonable doubt that the race and pen system comprised a significant experiential improvement for cattle as they met their end, but it was only a paucity of knowledge about cattle's experiential capacities at the time that permitted the inference that cattle were unaware of their fate.

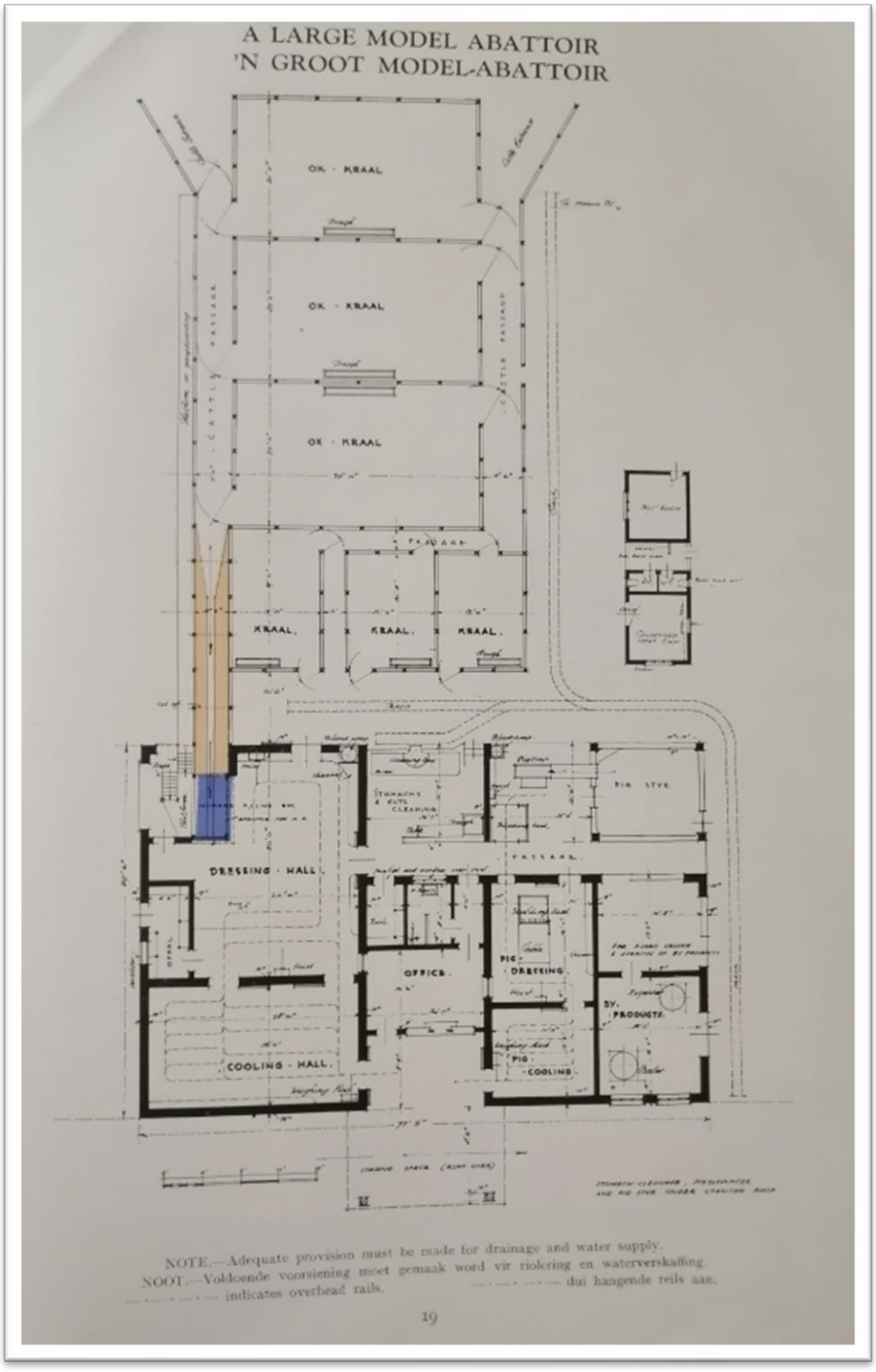
[275] The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs*, 8.
[276] *Ibid*.

Image 4.19. Small 'model' abattoir design



Source: The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs*, 17.

Image 4.20. Large 'model' slaughterhouse design

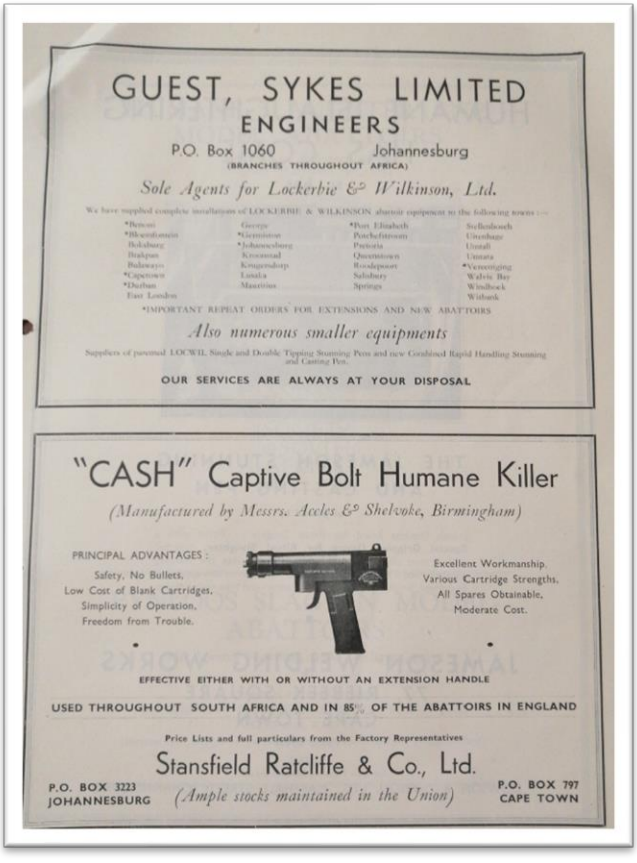


Source: The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs*, 19.

The small and large slaughterhouse plans above show how the 'race' and the 'casting pen' could be added to extant slaughterhouses to abide by the Act's prescription of their use. The race is depicted in yellow and the casting pen in blue – it is positioned between the kraals and the dressing hall. The drawings were produced by the Dutch-trained Cape Town City engineer Fred Bongers who had designed the Maitland extensions in 1928.[277] Other aspects of the new design resembled existing kraals, in particular the numerous gates and turns through which cattle had to pass.

The AWSSA also advertised in their brochure two suppliers of casting pens, and four suppliers of mechanical killers.

Image 4.21. Mechanical killer and casting pen advertisements



Source: The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs*, i.

[277] *Ibid*, 4.

The AWSSA promoted two types of mechanical killers. The one was a captive bolt pistol, which fired a 2.5-to-3-inch bolt into the animal's skull. The bolt stayed connected to the weapon and was withdrawn after penetrating the animal's brain. The weapons, the Temple-Cox, Shermer, and Cash pistols had to be wiped after use. [278] The other method involved a free bullet pistol which was not dissimilar to a handgun. Both types of mechanical killers were to remove 'human muscular energy' on which pithing and poleaxing depended.[279]

Image 4.22. Casting pens for religious slaughter, advertisement

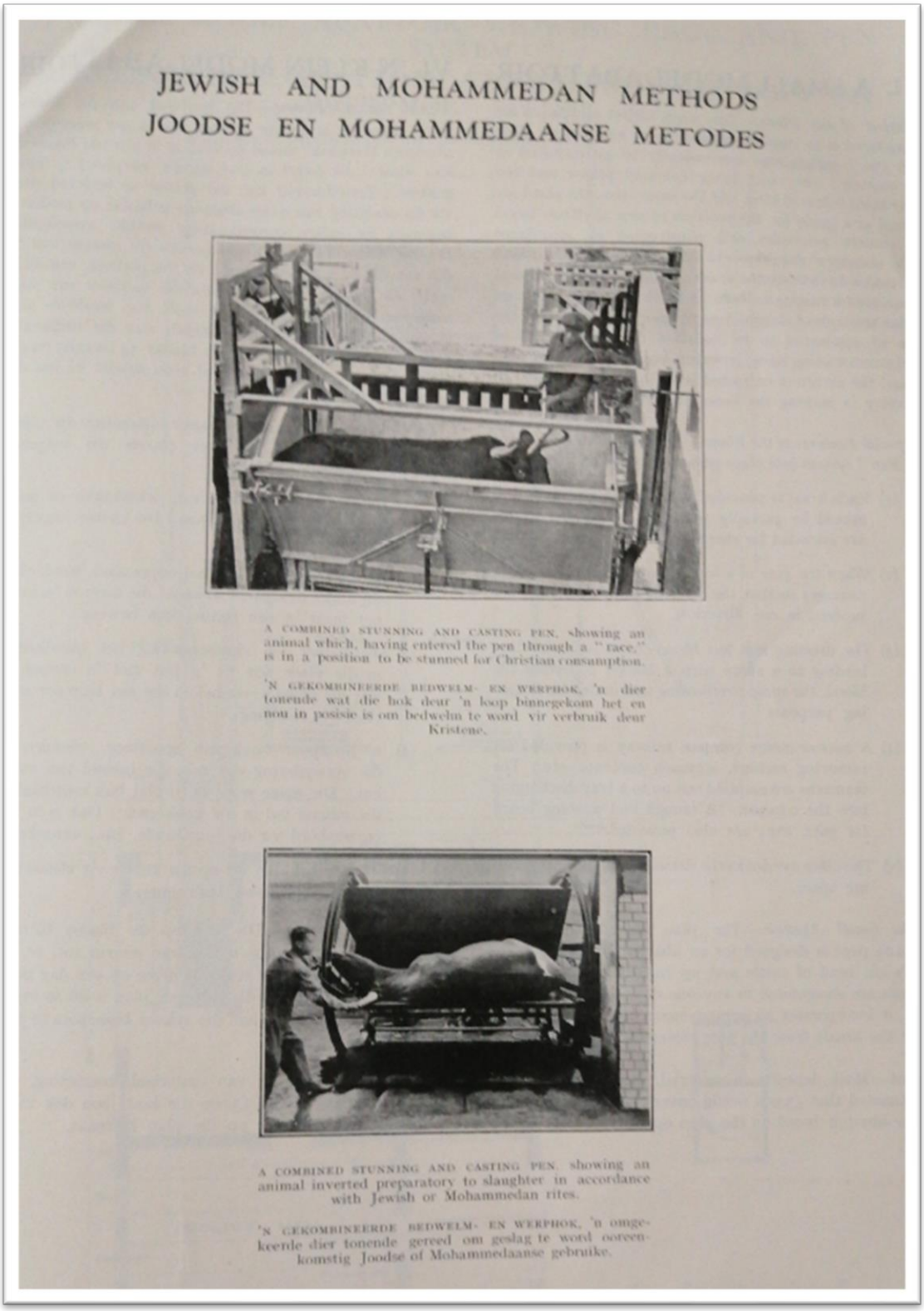
Source: The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs*, iii.

[278] *Ibid,* 10.
[279] *Ibid*.

The Act radically limited the employment of halal and kosher slaughter methods to those strictly 'necessary', by compelling slaughter men to apply for exemption certificates to slaughter without stunning. These methods prescribed, according to religious authorities at the time, that the animal had to be on their backs, with their necks exposed and extended upwards, and that stunning before exsanguination was forbidden. In the House of Assembly, in 1930, when these methods were discussed, a representative noted in parliament that 'the Jewish community is prepared to go to any expense to improve the method of casting'.[280] An Islamic representative, Dr Abdurahman, noted that the 'Mohammedan community would welcome any action that would make slaughtering more merciful …if it did not infringe on their religion'.[281] The Act stipulated that in slaughterhouses where more than fifty animals were slaughtered monthly, a race and an approved casting pen were obligatory. The AWSSA's model pen is shown below.

[280] *Ibid*, 14.
[281] *Ibid*, 20.

Image 4.23. Casting pen for kosher and halal slaughter



JEWISH AND MOHAMMEDAN METHODS
JOODSE EN MOHAMMEDAANSE METODES

A COMBINED STUNNING AND CASTING PEN, showing an animal which, having entered the pen through a "race," is in a position to be stunned for Christian consumption.

'N GEKOMBINEERDE BEDWELM- EN WERPHOK, 'n dier tonende wat die hok deur 'n loop binnegekom het en nou in posisie is om bedwelm te word vir verbruik deur Kristene.

A COMBINED STUNNING AND CASTING PEN, showing an animal inverted preparatory to slaughter in accordance with Jewish or Mohammedan rites.

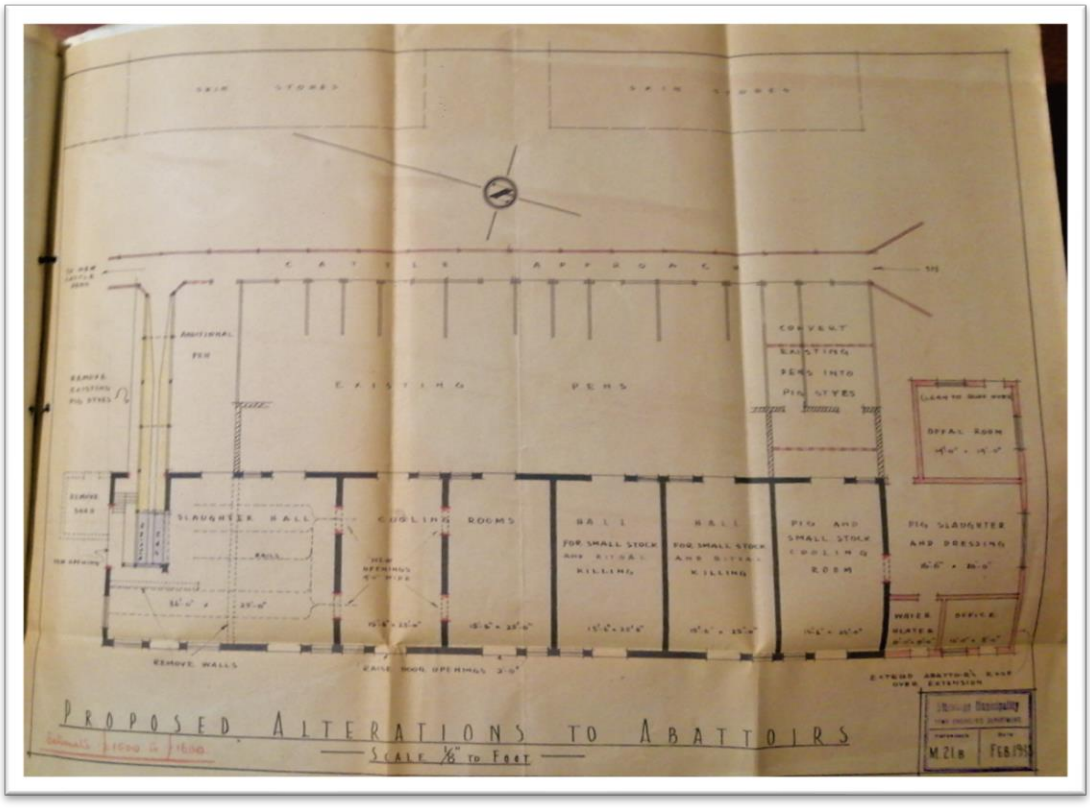
'N GEKOMBINEERDE BEDWELM- EN WERPHOK, 'n omgekeerde dier tonende gereed om geslag te word ooreenkomstig Joodse of Mohammedaanse gebruike.

Source: The Animal Welfare Society of South Africa, *Humane Slaughter and Model Abattoirs,* 15.

The animal is trapped in the pen (first image top) and then rotated onto his or her back (second image bottom), at which point the animal's throat is slit and is exsanguinated.

The law started to take effect on 1 January 1935. Thereafter slaughterhouses had to employ races and casting pens, mechanical killers became compulsory, and exemption certificates for religious slaughter had to be obtained from magistrates or local authorities. For illustration, consider the case of the Uitenhage public slaughterhouse. It was designed after the Act and built using the AWSSA' recommendations. The chief sanitary inspector wrote to the Town Clerk noting that the Uitenhage slaughterhouse had been re-designed with alterations in line with the requirements of the Act, and included the use of a Jameson Capture Casting Pen (refer to image 4.24).[282]

Image 4.24. Uitenhage proposed slaughterhouse alteration design, 1935



Source: CA, 3/UIT. 4/1/121. Abattoirs. Chief sanitary inspector to town clerk, 'Proposed new abattoirs', 25 February 1935.

[282] CA, 3/UIT. 4/1/121. Chief sanitary inspector to town clerk, 'Proposed new abattoirs', 25 February 1935.

On the far left, see the yellow race, and the blue casting pen where animals were to be slaughtered by mechanical killers. The following month alterations to include the pen and race were approved by the health committee.[283] The law, as this case suggests, began to take effect.

Conclusion

The chapter traced the emergence of an animal flesh market set up by the VOC to provision ships. It drew on zooarchaeological evidence and VOC documents to periodise the development of animal flesh production in the Cape. A core motive of Dutch colonialism in the Cape was to breed, kill, and sell cattle to VOC ships. It showed that with respect to animal slaughter, Dutch and British colonialism differed in that the latter was more regulated and formalised. Social pressures, expressed in local newspapers, the Shambles' proximity to the military and trading buildings, and a targeted civil court case, eventually saw the Shambles close down in the late nineteenth century. State-building processes deepened around this time. Often connected to health and sanitary concerns, specific legislation sought to regulate animal slaughter and conferred to municipalities the power to construct and manage state slaughterhouses. At the turn of the century, two major factors enabled the emergence of mass, industrialised slaughter: the war contracts, and the mine compound contracts. Huge sums of capital were injected into monopolistic animal flesh firms. In the Cape, state-building processes in the early twentieth century saw diverse arms of state, including veterinary officers, health officers, engineers, town clerks, municipal leaders, and the railway department work in concert to develop a centralised, state-run slaughterhouse for the Cape peninsula. In 1906 a Joint Slaughterhouse Committee emerged in Cape Town. It was intersectoral and specifically tasked to develop and manage slaughterhouses. The minutes and correspondence of this board were used extensively to analyse the development of industrial slaughter in the Cape. The chapter argued that centralised slaughterhouses were modelled on slaughterhouses in England, and that the human capital on which their development depended came from there. To depict the likely impact of slaughterhouses on

[283] CA, 3/UIT. 4/1/121. Extract from Report of the Health Committee, 4 March 1935.

cattle's experiences, the Committee's correspondence and minutes were interpreted alongside architectural designs of slaughterhouses and contemporary SPCA and journalist investigations into slaughterhouses. Cattle's experiences were clearly shaped by changing social and political contexts. The chapter examined how animal welfare campaigners lobbied for legislation to improve the methods and ways in which animal slaughter occurred. It showed that by reading official reports and correspondence against the grain, what emerges is that numerous arms of state – including health, veterinary, and agricultural departments – were responsive to concerns about the ways in which cattle were slaughtered. The chapter comprised the first history of slaughterhouses in southern Africa from an animal perspective.

Chapter Five: Colonial cattle breeding and its impact on cattle in South Africa, Swaziland, and Botswana, 1900s–1980s

> Pedigrees and eugenics – the application of selective breeding to people – are thoroughly out of fashion in contemporary thinking about human populations…. But this thinking is still the norm in relation to human control of animal breeding.[1] – Jacky Turner

[1] J. Turner, *Animal Breeding, Welfare and Society* (New York: Earthscan from Routledge, 2010), 293.

Introduction

Having looked at oxen's wagon labour, disease epidemics and veterinary regimes, and industrialised slaughterhouses, I now turn to an analysis of one further major impact of colonialism. Colonial impacts on cattle's subjectivities extended beyond labour, health, and ways of dying. Analysing state-supported colonial breeding projects and their later modernised forms, this chapter investigates which cattle were permitted to live and forced to reproduce, in particular from the early twentieth century until the 1980s. It focuses on South Africa, Swaziland, and Botswana to detect shifts in the region's cattle history. It aims to understand how breeding enterprises affected the lives and experiences of cattle and influenced the trajectory of their history. As explored in this chapter, forced artificial insemination (FAI) in particular, had a significant impact on cattle's experiences during the twentieth century. In South Africa, FAI started to occur from the 1930s but became more widespread from the mid-twentieth century. In Botswana this process emerged later, in 1967, and coincided with increased cattle slaughter rates. In both countries, FAI was preceded by colonial concerns with purebred bulls and pedigrees, notions which came to distinguish cattle as inferior and superior, and which were underpinned by concerns with productivity and profitability. Interestingly, colonists often claimed that local Africans in southern Africa were backward or primitive when they did not adopt modern, colonial breeding practices. Further, just as colonial states were marked by racial ideologies which regarded races in terms of superiority and inferiority, colonists invoked scientific discourses to perceive cattle breeds as inferior and superior.

Broadly, literature on cattle breeding in southern Africa can be arranged into four genres. First is a genetics literature, which examines genetic histories of cattle breeds, such as those of the broader southern African Sanga group, like Drakensbergers, Ngunis, and Africanders.[2] The second genre is starkly productionist, written often from veterinary and animal science

[2] H. Curson and R. Thornton, 'A Contribution to the Study of African Native Cattle', *Onderstepoort Journal of Veterinary Science and Animal Industry* 7, 2 (1936), 613–739; F. Stock and D. Gifford-Gonzalez, 'Genetics and African Cattle Domestication', *African Archaeological Review* 30, 1 (2013); S. Makina *et al*., 'Genetic Diversity and Population Structure among Six Cattle Breeds in South Africa Using a Whole Genome SNP Panel', *Frontiers in Genetics* 5, 333 (2014); L. Pienaar *et al*., 'Genetic Diversity of Afrikaner Cattle in Southern Africa', *Tropical Animal Health and Production* 50, 2 (2018), 399–404.

perspectives, but can include practical farmer perspectives, and is concerned ultimately with how to breed animals more efficiently and profitably.[3] Third, cattle breeding has been explored in relation to economic developments, colonial and veterinary expansions, and cattle industries.[4] Finally, cattle breeding more generally has been explored in histories of science and agriculture, exploring how ideas and contexts influenced different types of breeding practices, sometimes in relation to colonial contexts.[5]

Outside the southern African context, animal breeding has been linked to human eugenics and fascism.[6] A recent book, Tiago Saraiva's *Fascist Pigs: Technoscientific Organisms and the History of Fascism* (2016), explores the link between animal breeding, fascism in Germany, Portugal, and Italy, and colonialism in Libya, Ethiopia, Mozambique, Angola and Namibia. It is impressive in its geographical scope, and innovative in that it links histories of fascism to both histories of colonialism and histories of animal and plant breeding, by integrating the latter into the former. It does well to document how fascist colonial animal breeding regimes were implemented in Libya and Ethiopia.[7] Interestingly, that Scandinavian countries, the United Kingdom, the United States, Australia, and New Zealand had extremely extensive animal breeding projects from the mid-twentieth century, similar to those in fascist Europe, is not at all explored. With respect to their treatment of animals, it is therefore unclear what the book

[3] J. Bonsma, 'Breeding Cattle for Increased Adaptability to Tropical and Subtropical Environments Bonsma', *The Journal of Agricultural Science* 39, 2 (1949), 204–21; L. Lethola, N. Buck, and D. Light, 'Beef Cattle Breeding in Botswana', *Botswana Notes and Records* 15 (1983), 39–47; J. van Marle, 'The Breeding of Beef Cattle in South Africa: Past, Present, and Future', *South African Journal of Animal Science* 4 (1974), 197–304.

[4] L. Mafela, 'Colonial Initiatives and African Response in the Establishment of the Dairy Industry in the Bechuanaland Protectorate, 1930-1966', *Pula: Botswana Journal of African Studies* 13, 1 & 2 (1999), 77–92; C. Makgala, 'Provision of Local Services by Tribal Administrations in Bechuanaland Protectorate, 1900–1966', *South African Historical Journal* 64, 4 (2012), 787–806; W. Mwatwara and S. Swart, '"Better Breeds?" The Colonial State, Africans and the Cattle Quality Clause in Southern Rhodesia, c.1912–1930', *Journal of Southern African Studies* 42, 2 (2016), 333–50.

[5] S. Wilmot, 'From "Public Service" to Artificial Insemination: Animal Breeding Science and Reproductive Research in Early Twentieth-Century Britain', *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, *Between the Farm and the Clinic: Agriculture and Reproductive Technology in the Twentieth Century* 38, 2 (2007), 411–41; K. Brown and D. Gilfoyle (eds.), *Healing the Herds: Disease, Livestock Economies, and the Globalization of Veterinary Medicine* (Ohio: Ohio University Press, 2010) see chapters 12 and 13; B. Theunissen, 'Breeding Without Mendelism: Theory and Practice of Dairy Cattle Breeding in the Netherlands 1900–1950', *Journal of the History of Biology* 41, 4 (2008), 637–76; B. Mocheregwa, 'Artificial Insemination and the Cattle Industry in Botswana, 1960-2011', *Botswana Notes and Records* 48 (2016), 109–20.

[6] C. Patterson, *Eternal Treblinka: Our Treatment of Animals and the Holocaust* (New York: Lantern Books, 2002), 81–108; Turner, *Animal Breeding, Welfare and Society*, 293–308.

[7] T. Saraiva, *Fascist Pigs: Technoscientific Organisms and the History of Fascism* (Cambridge: MIT Press, 2016), 214, 216.

infers about these 'non-fascist' countries.[8] Although the fascist and 'non-fascist' countries had very similar animal breeding regimes, the former are criticised in Tiago Saraiva's book, while the latter face no scrutiny and criticism. This emphasises the point that the book is not concerned with what fascism and breeding meant for the animals themselves. There are examples that explore how breeding has impacted the animals themselves but not in relation to colonialism and/or southern Africa.[9]

This chapter proceeds in the following way: first, it opens by describing the cattle breeding context in South Africa before the twentieth century and notes its connection to colonisation processes. It then examines the emergence of agricultural colleges in South Africa and how these related to breeding becoming more institutionalised, professional, and measurable. Thereafter, it explores early colonial cattle breeding projects in Swaziland and Botswana, from the 1920s to the 1960s. It then investigates the data-driven emergence of the Bonsmara cattle breed as a way of illustrating progeny testing. After describing the context of the global development of artificial insemination for animal breeding, it closes by describing the modernised breeding regime that developed in Botswana from the 1960s. The chapter also briefly discusses the development of artificial insemination in South Africa. Globally, the early twentieth century saw major developments in human eugenics, although after WWII human eugenics lost much of its support. However, as this chapter discusses, from the mid-twentieth century animal eugenics became entrenched and proliferated across the globe. In that the reproduction of domesticated animals became industrialised, the global proliferation of forced artificial insemination in the mid-twentieth century likely comprised the most transformative development in the history of domesticated animals. The development of artificial insemination in Botswana and South Africa is explored in the context of the global proliferation of artificial insemination.

This chapter argues that current cattle breeding regimes in southern Africa should be historicised as a direct consequence of colonialism that dramatically impacted cattle history.

[8] *Ibid*, the core passage on this is on page 12.
[9] L. Beldo, 'Metabolic Labor: Broiler Chickens and the Exploitation of Vitality', *Environmental Humanities* 9, 1 (2017), 119, 120–21, 124; S. Colling, *Animal Resistance in the Global Capitalist Era* (East Lansing: Michigan State University Press, 2021), 20, 59, 88.

In Botswana, Swaziland, and South Africa, forced artificial insemination – the industrialisation of reproduction – was for cattle an explicit impact of colonialism. The previous chapter argued that cattle slaughter in South Africa was industrialised in the early twentieth century, while Chapter Three argued that veterinary regimes came to exert control over animals' productive health from the late nineteenth century. In the mid- to late-twentieth century both slaughter and reproduction were industrialised in Botswana. In South Africa forced artificial insemination processes became more widespread from the mid-twentieth century. In Swaziland, these processes were not as common as in Botswana and South Africa but were deployed in the late twentieth century. A bovine view suggests that, specifically in terms of breeding in Botswana, human political independence or decolonisation did not imply an end to colonial breeding regimes. Instead, in Botswana colonial breeding systems were extended and consolidated after human independence. This suggests that human political independence does not necessarily imply experiential or transformative shifts for cattle histories, but actually entailed a deepening of colonial breeding processes for cattle. This is one case in which cattle history and human history chronologies became clearly distinct.

Pre-twentieth century cattle breeding context

Chapter One showed that from the ninth century Proto-Nguni speakers south of the Drakensberg Escarpment spread out across the Grasslands and started to innovate breeding taxonomy terms. This included words such as castrate, and words which distinguished the sex, age and breeding capacities of cattle. Thus, southern African cattle-keeping societies were engaged in breeding cattle from around the second millennium onwards. After Dutch colonists arrived in the mid-seventeenth century, they connected cattle, sheep and goat breeding practices to the global economy via the Cape of Good Hope. One transformation was that cattle and sheep were bred by settler colonists to be slaughtered, sold, and consumed, whereas southern African cattle keepers ate cattle, sheep, and goat flesh ceremonially and thus more rarely.[10] Butchering, selling, and eating animals became central to colonial economies in the region.

[10] See Chapter Two.

Colonial breeding ideas and practices, linked to European ideas of flesh consumption, comprised major affective and experiential impacts for cattle in southern Africa. Colonialism in the Cape was always distinctly connected to breeding cattle, as attested explicitly by VOC policy: 'It is stated that instructions have been received from the Chamber of Seventeen to increase as much as possible the number of cattle by breeding'.[11] Attempts to introduce European cattle into the Cape appear to have failed in the seventeenth and most of the eighteenth century, likely because imported cattle were worked to exhaustion via forced ploughing.[12] After the late eighteenth century, colonists increasingly imported cattle from Britain and the Netherlands. Some cattle themselves became mixes of local Sanga cattle and British and Dutch cattle.

Willem Stephanus van Ryneveld was commissioned by the British government to report on how to improve the Cape's economy, including the prospects of animal breeding and production. In his 1804 report he noted that, twenty or twenty-five years prior, the governor of Plettenburg had imported 'een Friesche Bul en Koe', one Friesian bull and cow.[13] Mentions from observers in the late eighteenth century and the nineteenth century suggest cattle from Britain were imported and bred across what became South Africa.[14] In the early nineteenth century, settler colonists could readily access imported British cattle.[15] Author and editor John Noble wrote or compiled several handbooks on the Cape colony and other parts of southern Africa. In his remarkably detailed *History, Productions and Resources of the Cape of Good Hope* (1886), he noted that Charles Somerset, governor of the Cape Colony from 1814 to 1826, gave his 'personal encouragement to the improvement of the breed of horses, cattle,

[11] G. Theal, *Abstract of the Debates and Resolutions of the Council of Policy at the Cape from 1651 to 1687* (Cape Town: Saul Solomon and Co, 1881), 16.
[12] A. Heinrich, 'A Zooarchaeological Investigation into the Meat Industry Established at the Cape of Good Hope by the Dutch East India Company in the Seventeenth and Eighteenth Centuries' (PhD Dissertation, The State University of New Jersey, New Jersey, 2010), 23.
[13] W. van Ryneveld, *Aanmerkingen over de Verbetering van Het Vee Aan de Kaap de Goede Hoop* (Kaap de Goede Hoop: A. Richert, 1804), 42.
[14] A. Barnard, *South Africa a Century Ago (1797 - 1801)* (Cape Town: Maskew Miller Limited, n. d), 23, 42; H. Lichtenstein, translated by A. Plumptre, *Travels in Southern Africa, in the Years 1803, 1804, 1805, and 1806* (London: Henry Colburn, 1812), 114, 217, 234; G. Thompson, *Travels and Adventures in Southern Africa* (London: Henry Colburn, 1827), 125, 204, 206; J. Barrow, *Travels into the Interior of Southern Africa* (London: T. Cadwell and W. Davies, 1806), 36.
[15] Thompson, *Travels and Adventures in Southern Africa*, 206.

and sheep by the importation of the best stock'. [16] The 1820 British settlers were formally designated 'Agricultural Emigrants'.[17] In the Cape, by 1870, cattle, sheep, goats, asses, mules, and horses had become subject to the Cattle Removal Act, which regulated and restricted their movement.[18] Persons wanting to move such animals more than 15 kilometres had to acquire a certificate of permission from a resident magistrate, colonial official or landowner, which included descriptions and the number of cattle. This was an early form of surveillance that would come to characterise many cattle's lives. By the 1880s John Noble noted that the 'chief Pastoral pursuits of the colonists are horse, cattle, goat, ostrich, and sheep-breeding; and fully one-third of the entire population may be said to be engaged in these and other occupations subsidiary thereto.'[19] He noted that the:

> cattle of the Colony include the descendants of the long-horned native species which the Hottentots possessed in Van Riebeek's time, crossed with the Dutch breed introduced by the early colonists. To these have been added contributions from nearly every breed known in England and Holland—Shorthorns, Herefords, Ayrshires, Devons, Alderneys and Kerries.[20]

In 1892, the Cape's Brands Registration Act of 1890 enabled local councils to make orders for branding cattle, horses, and ostriches, and created a registrar of brands for the Cape Colony. In time, thousands of animals became painfully branded with searing iron or tattoos – and were registered in the colonial records. Late into the nineteenth century cattle breeding was the province of dispersed farmers and a few commercial breeding specialists.[21]

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[16] J. Noble, *History, Productions and Resources of the Cape of Good Hope* (Cape Town: W. A Richards & Sons, 1886), 58.
[17] S. W Silver and Co, *S. W Silver & Co's Handbook to South Africa* (London: S. W Silver & Co, 1880), 242–43.
[18] L. van Sittert, 'Writing on Skin: The Entangled Embodied Histories of Black Labour and Livestock Registration in the Cape Colony, C. 1860-1909', *Kronos* 40, 1 (2014), 77–78.
[19] Noble, *History, Productions and Resources of the Cape of Good Hope*, 236.
[20] *Ibid*, 237, and compare to Silver and Co, *S. W Silver & Co's Handbook to South Africa*, 220.
[21] Pretoria National Archives (hereafter PNA), CVS1/52, G. King and Sons, breeders of shorthorns to the Colonial Veterinary Surgeon, 17 June 1898.

Breeding societies, and Agricultural colleges and schools in South Africa, 1902–1920s

In the early twentieth century, two principal types of institutions signalled the shift towards standardised pedigree breeding in South Africa. These were cattle breeders' societies and agricultural colleges.

In 1905 the Stud Book Association was constituted at a colonial stud breeders' conference in Bloemfontein.[22] A stud is a male animal held for breeding purposes. The first SA Studbook was published in 1906, and pedigree breeds of horses, goats, sheep, pigs and cattle were recorded.[23] Studbooks, as Nigel Pemberton and colleagues put it, 'signalled attempts to better standardise…animals and to have their features recognised as breeds'.[24] Notions of pedigrees underpinned stud books, and stud books, in turn, gave rise to the emergence of specific pedigree cattle breeding societies. Pedigrees are fictions. 'The pedigree of a domestic animal', writes Jacky Turner, 'is essentially a marketable brand' that protects 'those who invest in the brand by breeding.'[25] A pedigree black and white Friesian cow, for example, was in the nineteenth century simply a cow from Friesland whose body conformed to what breeders in Friesland took to be the prestigious archetypical black and white Friesian cow.[26]

In Britain, cattle breeders started registering cattle in public stud books in the mid-nineteenth century.[27] There, the first Herd Book for cattle was published for Herefords in 1846, and a society to promote Herefords was constituted in 1878. An Aberdeen Angus First Herd Book was started in 1862, and its breeding society was formed in 1879. The English Jersey Cattle Society started a Herd Book in 1878 and arranged a 'conformation competition' and butterfat testing.[28] Selective cattle breeding in Britain had by the early twentieth century become

[22] SA Stud Book, 'SA Stud Book's History', *SA Stud Book*, https://studbook.co.za/p107/about-us/sa-stud-book's-history.html., accessed 3 April 2021.
[23] *Ibid*.
[24] N. Pemberton, J-M. Strange, and M. Worboys, 'Breeding and Breed', in H. Kean and P. Howell (eds.), *The Routledge Companion to Animal-Human History* (London: Routledge, 2019), 406.
[25] Turner, *Animal Breeding, Welfare and Society*, 225.
[26] Theunissen, 'Breeding Without Mendelism', 655.
[27] Pemberton, Strange, and Worboys, 'Breeding and Breed', 406.
[28] *Ibid*.

dramatically influential. The 1908 census showed that cattle of the Shorthorn variety comprised 64% of the national herd.[29]

Cattle breeding societies in South Africa were formed in the early twentieth century; they emerged after the public Stud Book in 1906. In 1912 there were Afrikaner and Shorthorn breeders' societies, and in 1914 a society for South Devon cattle breeders.[30] Breeding societies for Aberdeen-Anguses, Herefords, and Ayrshires emerged in 1917, for Sussexes, and Jerseys in 1920, and for Red Polls in 1921.[31] Apart from private breeding societies, the agricultural colleges and also the state via its Department of Agriculture had become interested in purebred cattle.

The significance of applied agricultural research and development in the early twentieth century is evident in part by the number of agricultural schools that emerged: in the Cape, Elsenburg (1898) and Grootfontein (1911); in Natal, Cedara (1905); Potchefstroom in the Transvaal (1909) and; Glen (1919) in the Orange Free State.[32] Each of these colleges had a specific pedigree cattle breeding programme. Purebred cattle were then sold to farmers. The state's general ambition was to upgrade the national herd, in terms of higher flesh to carcass ratios of bulls, and higher milk yields for cows, so that the value of the cattle trade would increase. Because Onderstepoort's veterinary and agricultural research had met success in

[29] J. Grundy, 'The Hereford Bull: His Contribution to New World and Domestic Beef Supplies', *The Agricultural History Review* 50, 1 (2002), 80.
[30] SA Stud Book, 'SA Stud Book's History'; Farmer's Weekly, 'Shorthorn (blog)', *Farmer's Weekly*, 23 April 2012, https://www.farmersweekly.co.za/farm-basics/how-to-livestock/shorthorn/, accessed 3 April 2021; South Devon Cattle Breeders' Society, 'South Devon's Prime Beef, About the Breed', *South Devon*, https://www.southdevon.co.za/Breed-About.htm, accessed 3 April 2021.
[31] SA Hereford, 'Hereford Breed History', *SA Hereford*, https://www.hereford.co.za/Breed-History.htm accessed 3 April 2021; Angus Society of South Africa, 'History of the Angus Society', *Angus Society of South Africa*, http://www.angus.org.za/history/ accessed April 3, 2021; Ayrshire, 'History of the Ayrshire Breed', *Ayrshire*, http://www.ayrshire.co.za/p2/about-the-breed/history-of-the-ayrshire-breed.html, accessed 3 April 2021; Sussex, 'The History of the Sussex Breed', *Sussex*, http://sussex.co.za/p13/sussex-breed/the-history-of-the-sussex-breed.html, accessed 3 April 2021; Jersey SA, 'Historical Origin Of Jerseys', *Jersey SA*, https://www.jerseysa.co.za/Breed-History.htm, accessed 3 April 2021; Red Poll Cattle Breeder's Society of SA, 'History of the Red Poll Cattle Breeder's Society', *Red Poll Cattle Breeder's Society of SA*, http://www.redpollsa.co.za/p2/the-society/history-of-the-red-poll-cattle-breeder's-society.html, accessed 3 April 2021.
[32] S. Dubow, *A Commonwealth of Knowledge: Science, Sensibility, and White South Africa 1820-2000* (New York: Oxford University Press, 2006), 180; J. Fisher, 'Cedara School of Agriculture: Its History and Development', *Farming in South Africa*, (May, 1929), 67. For agricultural schools in the Transkei see J. Tischler, 'Education and the Agrarian Question in South Africa, c. 1900–40', *The Journal of African History* 57, 2 (2016), 255.

combating cattle diseases, in 1911 a centralised Department of Agriculture was formed.[33] It aimed to control animal diseases and modernise farming.[34] Under the Milner administration, the department was from its first iteration in 1902 starkly interventionist and 'laid the foundations' for much of what became the South African state.[35] As with state control over cattle explored in Chapters Three and Four, the emergence of the Department of Agriculture connects revealingly with political philosopher Kimberly Smith's argument that the development and consolidation of modern states was premised upon expansively controlling animals.[36]

In his annual report in 1919, the South African Minister of Agriculture reflected on the first two decades of cattle breeding in the twentieth century.[37] Apart from 'a few bright exceptions', he wrote, animal farming had before then 'consisted of little more than nomadic grazing'.[38] In 1898, the export of wool, mohair, hides and skins, and ostrich feathers amounted to £4 507 772, while imports of animal products, including flesh, processed pig flesh, butter, cheese, and chickens' eggs cost £1 112 961.[39] Since then, he claimed, 'almost revolutionary changes' had occurred. Cattle, pig, and chicken flesh, cows' secretions, and chickens' eggs industries had boomed to the extent that in 1919 these exports were valued at £14 354 039.[40] By 1920, 68 689 'pure bred animals' had been recorded in the Studbook.[41]

The Cedara and Potchefstroom agricultural schools had sent flesh consignments to the Liverpool and Smithfield markets that were 'warmly praised'.[42] But, to meet the London market's requirements cattle breeding needed to be 'vastly improved', and the minister

[33] Dubow, *A Commonwealth of Knowledge: Science, Sensibility, and White South Africa 1820-2000*, 180.
[34] W. Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock, and the Environment 1770-1950* (Oxford: Oxford University Press, 2008), 224.
[35] S. Milton, 'The Killing Floor: The First World War and the Emergence of the South African Beef Industry 1902-24', *Collected Seminar Papers. Institute of Commonwealth Studies* 48 (1994), 82; Beinart, *The Rise of Conservation in South Africa*, 224.
[36] K. Smith, *Governing Animals: Animal Welfare and the Liberal State* (New York: Oxford University Press, 2012), 19.
[37] The National Archives of the United Kingdom in London (hereafter TNA), CO 633/148. Union of South Africa. House of Assembly, Index of the Printed Annexures, First Session, Fourth Parliament 1921, 9.
[38] TNA, *Report of the Secretary for Agriculture*, 1921, 9.
[39] *Ibid*.
[40] *Ibid*.
[41] *Ibid*.
[42] *Ibid*, 11.

implored farmers to realise that 'only well bred and well fed *young* animals' would suffice.[43] He attributed the increased financial value of domesticated animals to 'large importations of high-class stock from abroad and improvements in animal husbandry'.[44] Between 1910 and 1918, 7004 pedigree cattle, 23 861 stud sheep and 364 pigs had been imported into South Africa, and he estimated that South Africa had 10 000 'well bred bulls' among its national settler herd.[45] 28 196 cattle brands had been registered by 1919.[46]

The trade in cattle bodies for slaughter was substantially regional at the time. In 1919, 9 065 cattle were imported for slaughter from Rhodesia, 4 152 from the Bechuanaland Protectorate, 2 276 from South West Africa, and 1 693 from Swaziland, while 13 589 'breeding stock' animals were imported from Bechuanaland.[47] The value of the 6 851 924 settler-owned cattle was £100 000 000 in 1920, the minister estimated.[48] Between 1910 and 1918 South Africa exported over 40 million kilograms of cattle flesh.[49]

It was 'particularly urgent', he said, that pigs and cattle reached 'early maturity'.[50] He wanted to speed up the time to slaughter-maturity. The minister noted that recent increased attention to cows' butterfat and milk recordings was welcomed.[51] By 1920, ideas of pedigree breeding, milk and butterfat surveillance, and bulls reaching mature weights as soon as possible were entrenched in state agricultural thinking.

The agricultural schools were indicative of increasing farming specialisations; they had experts in agricultural law, dairying, and breeding; they offered courses and practical demonstrations, and conferred diplomas and other qualifications. They signalled the modernisation of agriculture in South Africa. To young learners or those who wanted to become farmers or develop their skills, the agricultural colleges inculcated into them a strongly productionist view of animals, in which the exploitation of animals for their milk or

[43] *Ibid*.
[44] *Ibid*, 9.
[45] *Ibid*, 29; TNA, CO 633/148, *Statement of Pedigree Stock Imported 1910-1918*, 1921, 164.
[46] TNA, CO 633/148, *Report of the Registrar of Brands and Controller of Fencing, 1921*, 159.
[47] TNA, CO 633/148, *Report of the Principal Veterinary Surgeon*, 1921, 40.
[48] TNA, CO 633/148, *Report of the Secretary for Agriculture, 1921*, 29.
[49] TNA, CO 633/148, *Statement of Meat Exported 1910-1918, 1921*, 164.
[50] TNA, CO 633/148, *Report of the Secretary for Agriculture*, 1921, 30.
[51] *Ibid*, 16

flesh or labour was normalised. The state's view on domesticated animals – useful as producers or as flesh – was diffused to generations of learners who were trained at the agricultural colleges.

All five of the agricultural colleges were keenly involved in pedigree cattle breeding. In explicitly productionist terms, they minutely recorded the number and type of purebred cattle, the numbers of days cows were milked per annum, and well as the latter's average milk and butterfat records.[52] Cows with higher butterfat percentages in their milk, and those who could produce larger quantities of milk, were prized. Although dairy industries are not the focus of this chapter, it is important to recognise some of the experiential shifts cows and calves experienced from modernised dairy industries from the bovine perspective. For cattle, these shifts bear on what it meant that cows' milk outputs were monitored by colonial state institutions.

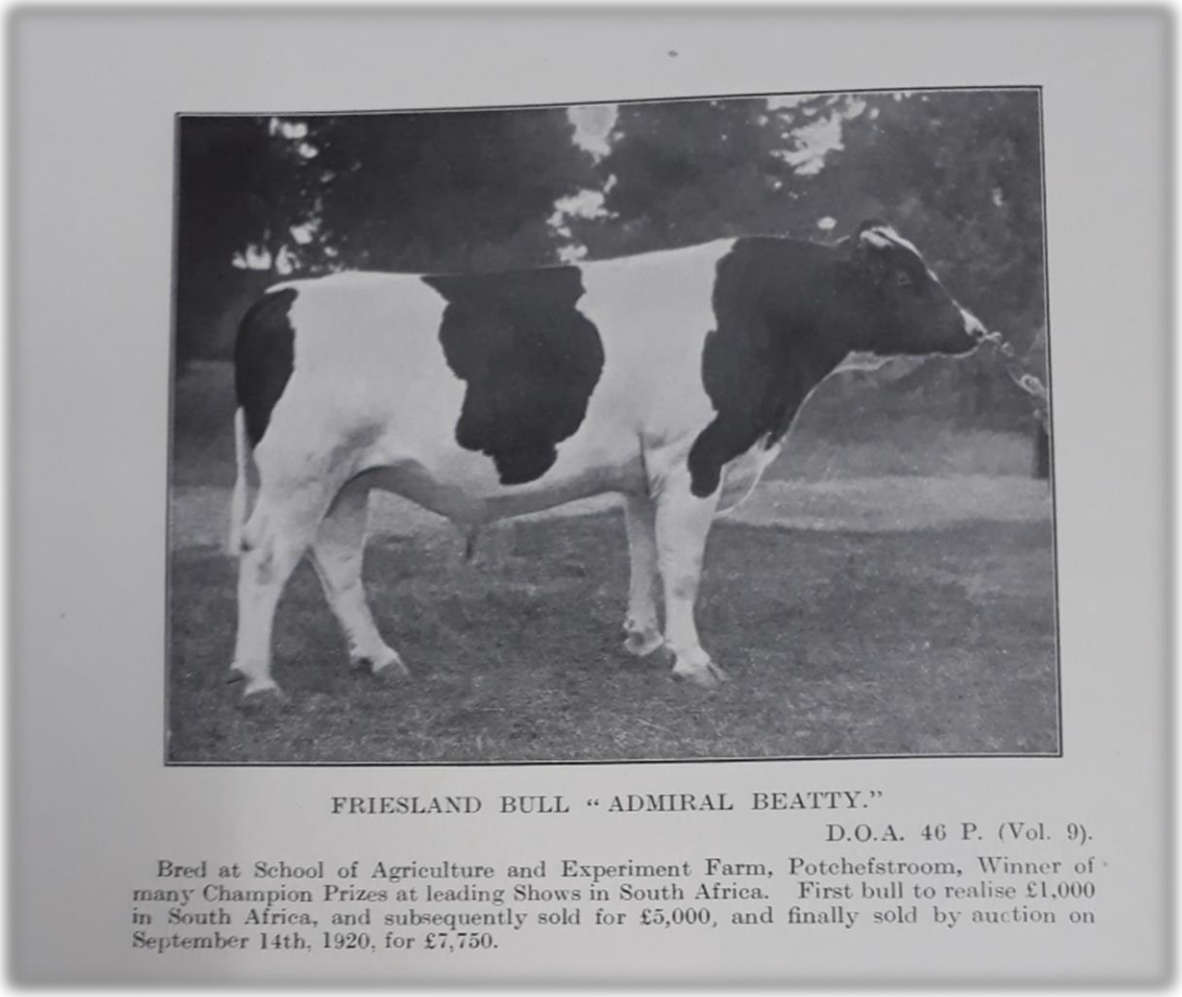
Whereas calves naturally wean themselves after 10 months, or about 300 days, one Shorthorn cow at Cedara, called S.43, was milked for 467 days. A Friesland cow, F.5 was milked for 523 consecutive days.[53] When a calf stops drinking his mother's milk, his mother stops producing milk. When cows are artificially milked by humans, they can continue to produce milk beyond the natural 10-month cycle. Intensive milking, subjecting cows' udders to extreme, extended milking periods, caused many cows to suffer mastitis, which is a painful swelling and infection of their udders.[54]

The agricultural schools each specialised in different breeds of cattle. For instance, in 1919 Grootfontein School of Agriculture sold 10 Friesland bulls, 14 cows, 4 heifers, as well as 4 Hereford bulls and 4 Shorthorn heifers. They also sold scores of purebred horses, goats, sheep, and chickens.[55] The Potchefstroom school in the same year sold 31 purebred cattle, comprising Frieslands, Ayreshires, Lincoln Reds, Herefords, Sussex's, and Africanders.[56] In

[52] TNA, CO 633/148, *Report on Agricultural Education*, 1919, 60, 84, 90.
[53] *Ibid*, 84.
[54] C. Fitzpatrick *et al*., 'The Effect of Meloxicam on Pain Sensitivity, Rumination Time, and Clinical Signs in Dairy Cows with Endotoxin-Induced Clinical Mastitis', *Journal of Dairy Science* 96, 5 (2013), 2847–56; TNA, CO 633/148, *Report on Agricultural Education*, 1919. CO 633/148., 72.
[55] TNA, CO 633/148, *Report on Agricultural Education*, 1919, 62.
[56] *Ibid*, 73.

1919 they held 407 breeding cattle, including what they called cross-bred Africanders and Trek oxen.[57] Cedara specialised in breeding Frieslands, Shorthorns, Aberdeen Anguses, and Ayreshires, of whom they had 207 in 1919.[58] The Glen school bred and sold Frieslands, Lincoln Reds, and South Devons and had 208 purebred cattle in 1919.[59] The value of purebred animals sold at Elsenburg, Grootfontein, Glen, Cedara and Potchefstroom increased from £7 303 in 1915 to £28 251 in 1918.[60] A single Friesian bull bred at Potchefstroom, for example in 1920 sold for £7 750.

Image 5.1. Friesland bull Admiral Beatty



FRIESLAND BULL "ADMIRAL BEATTY."

D.O.A. 46 P. (Vol. 9).

Bred at School of Agriculture and Experiment Farm, Potchefstroom, Winner of many Champion Prizes at leading Shows in South Africa. First bull to realise £1,000 in South Africa, and subsequently sold for £5,000, and finally sold by auction on September 14th, 1920, for £7,750.

Source: TNA, CO 633/148, *Report on Agricultural Education*, 1919, iv.

[57] *Ibid*.
[58] *Ibid*, 83.
[59] *Ibid*, 90.
[60] *Ibid*, 23.

State-supported agricultural schools were specialising in breeding bulls and cows. Knowledge of cattle breeding was becoming increasingly specialised, and cows' value was becoming determined by their milk yields. The Agricultural Department saw purebred bulls and cows as the solution to establishing a competitive cattle industry. Cattle's sexual and reproductive autonomy was inhibited and controlled. Via the Agricultural Department, the state became hyper-focused on milk and butterfat yields. Cattle breeding was becoming rationalised and modernised in South Africa.

Colonial breeding regimes in Botswana and Swaziland, 1920s–1940s

From the 1920s in Bechuanaland, and the 1930s in Swaziland, the British settler colonial states started instituting breeding centres, ostensibly to improve the type of cattle and advance their cattle industries. The outcomes differed notably in that in Swaziland colonial cattle breeding programmes were largely unsuccessful, while in Botswana such programmes became increasingly entrenched.

Notably, state involvement in cattle breeding in Britain was a very recent development; prior to WWI, the state was not involved in cattle breeding.[61] In 1914 the British state implemented a Livestock Improvement Scheme as a 'public service'.[62] This scheme centred on the perceived problem of farmers' limited access to superior pedigree sires, including boars, horses, and bulls. The scheme enabled farmers' access to breeding bulls and encouraged and incentivised farmers to record cows' milk outputs as a way to enable a better selection of bulls for breeding. 'Livestock Officers', a novel class of civil servants, thus emerged to advise farmers on bull selection. The scheme offered grants to farmers and breeding societies. Breeders would pay a service fee and then bring their cows to designated farms where the selected bulls were detained for breeding. Milk output records were intended to guide their culling of less productive cows and enable bull selections. In the mid-1920s pedigree bull breeders requisitioned the British state to adopt policies to 'eliminate' bad or 'scrub' bulls via slaughter or castration. These requisitions culminated in the Improvement of Livestock (Licensing of Bulls) Act of 1931, which made it illegal for farmers to retain a bull older than ten months

[61] Wilmot, 'From "Public Service" to Artificial Insemination', 420.
[62] *Ibid*.

unless that bull had a permit to live. The ministry of agriculture was sanctioned to slaughter bulls without such a permit.[63] In this way, by the 1930s the British state exercised extreme control over the breeding of cattle and institutionalised the slaughter and castration of undesirable bulls, as well as recording cows' milk outputs. Until the emergence of artificial insemination in Britain in the 1940s, the Livestock Improvement Scheme was the state's predominant mechanism for controlling animal breeding.[64] From the bovine view, this scheme and its state-sponsored slaughter and castration policies was a violent and tragic development in cattle history. As we shall see, it foreshadowed the industrialisation of forced artificial insemination in both Britain and Botswana.

Britain exported its ideas and practices regarding cattle breeding to its southern African protectorates in the 1920s and 1930s. In Bechuanaland in the Ngwaketse and Kwena reserves 'bull camp schemes' were established in 1924 and 1926 respectively.[65] Select bulls were supplied by the government and farmers could bring cows to be impregnated by such bulls.[66] For bulls, it was a form of sustained sexual abuse. Like the Kayne Bull Camp, in southern Bechuanaland, these schemes were regarded as unsuccessful, due to a low uptake from cattle keepers, and were soon discontinued.[67]

In the context of Bechuanaland's absent rains in 1931 and the drought which ensued, as well as South Africa embargoing cattle imports under the pretext of the Foot and Mouth outbreak in Southern Rhodesia, the protectorate faced the prospect of losing its sole cattle export market.[68] Resident Commissioner Rey turned to cattle breeding interventions. Grants were secured by the Colonial Development Fund to drill boreholes to provision cattle, since much of the country lacked adequate water to supply cattle in large numbers, and from 1937 to set

[63] *Ibid*, 421.
[64] *Ibid*.
[65] Makgala, 'Provision of Local Services by Tribal Administrations in Bechuanaland Protectorate, 1900–1966', 797.
[66] *Ibid*, 796.
[67] *Ibid*, 797; Botswana National Archives (hereafter BNA) 425/ S.4251/1, H. Price to Resident Magistrate, Kanye. 'Bulls: Bulls and Bull Camp Kanye', 17 January 1936.
[68] M. Hubbard, 'Desperate Games: Bongola Smith, the Imperial Cold Storage Company and Bechuanaland's Beef, 1931', *Botswana Notes and Records* 13 (1981), 20.

up Livestock Improvement Centres with government-supplied breeding bulls.[69] These were modelled in part on the British Livestock Improvement Scheme. Livestock Improvement Centres were instituted in the Bakwena, Bangwaketse, Bangwato, Barolong, Balete, and Bakgatla reserves to crossbreed Tswana cattle with imported cattle and then sell bulls and heifers to farmers.[70] All reserves used Africander bulls but the Balong centre also used Shorthorns, the Bangwaketse Sussexes, and the Bangwato centre used Friesian cattle. From the perspective of producing more marketable cattle flesh and dairy yields, the results were mixed. By 1944 Africander cattle, indigenous to the region, were the predominant and majority breed used by all centres.[71] The British breeds had largely been abandoned. In that these centres were modelled on the British schemes, and funded by the Colonial Development Fund, they were an explicit impact of colonialism. The breeding schemes mirrored those pursued in colonial Nigeria and Kenya.[72]

In colonial Swaziland, similar breeding regimes were set up in the 1930s and 1940s. Writing to the Swaziland resident commissioner in 1932, the Swaziland principal veterinary officer noted that 'trying to improve native cattle by distributing expensive bulls at native kraals is a failure'.[73] Loaning select bulls to herders had been the approach in Basutoland. In a likely expression of his racial prejudice, he continued that indigenous Swazis did not appreciate that imported cattle required 'more care and attention' and that in cases where loaning cattle was attempted, the cattle's lives were 'short'.[74] He recommended a state-run farm

> with one pure bred bull of different breeds, five pure bred females of the different breeds and 150 selected native bred females: the pure bred males [will be] mated with all the females to breed pure bred animals, and to keep up the supply of grade bulls for distribution amongst the native.[75]

[69] Makgala, 'Provision of Local Services by Tribal Administrations in Bechuanaland Protectorate, 1900–1966', 797; E. Hillbom, 'Cattle, Diamonds and Institutions: Main Drivers of Botswana's Economic Development, 1850 to Present', *Journal of International Development* 26, 2 (2014), 165–66.
[70] Lethola, Buck, and Light, 'Beef Cattle Breeding in Botswana', 39.
[71] *Ibid*.
[72] Makgala, 'Provision of Local Services by Tribal Administrations in Bechuanaland Protectorate, 1900–1966', 798.
[73] Swaziland National Archives (hereafter SNA) RCS 408/32 Memorandum by Principal Veterinary Officer Swaziland W. Elder to Resident Commissioner's despatch, Swaziland, 8 March 1932, 140.
[74] Ibid.
[75] Ibid.

In addition, he recommended that:

> a campaign against the native scrub bull would have to be carried out. I propose that all native bulls be castrated, only one bull to every twenty five cows or heifers being allowed to remain uncastrated. This work in the first place should be carried out by the Government, and after that, the owner should be compelled to castrate all bulls under twelve years old. With the simplified methods of castration it is not a difficult matter for this to be carried out.[76]

This breeding project was implemented in 1934, funded by the Colonial Development Fund. It came to comprise various bull camps where Swazis could bring their cows to be impregnated and also a government farm for the same purpose. By 1937 cattle inspectors were employed to castrate undesirable 'scrub' cattle.[77] In the same year, at the government breeding farm, there were 60 bulls, 152 cows, 45 heifers, and 111 calves.[78] The Swazis were not receptive to the breeding schemes. They were disinclined to sell bulls to the camps, and did not want to purchase so-called graded bulls from them.[79] By June 1940 only 98 bred bulls were sold by the government to Swazi herders and the same number had been deemed unsuitable and slaughtered.[80] Three years later a total of 1 239 cattle were imported for breeding.[81] In 1944 an additional farm at Mpisi was purchased via the Colonial Development Fund to establish another cattle breeding centre.[82] The Mpisi Cattle Breeding and Experimental Station came into operation during 1947 to improve local Nguni cattle and to breed Africander cattle.[83] Again, Swazis neither wanted to sell their cattle to the breeding station nor purchase graded bulls.[84] A commission into the Swaziland cattle industry later concluded that the breeding regimes were unsuccessful because Swazis refused to recognise the economic value of breeding more marketable cattle. For indigenous Swazis, they wrote, there

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[76] Ibid.
[77] SNA, RES 665/38, *Annual Report 1937: Veterinary and Agricultural Department*, 3.
[78] *Ibid*, 4.
[79] TNA, DO35/919/11, R. Thornton, Agricultural Advisor to the High Commissioner, to the Government Secretary, Swaziland 'Swaziland Improvement Scheme', 6 May 1940, 1.
[80] TNA, DO35/919/11, Swaziland High Commissioner, E. Harding to Viscount Cranborne, Dominions Office, 'Colonial Development Fund Cattle Improvement Scheme', 7 November 1940, 2.
[81] SNA, 793, 673/37, *Annual Report Veterinary and Agricultural Department 1942 and 1943, 1944*, 21.
[82] SNA, 793, 673/37, *Director of Livestock and Agricultural Services Report 1939-1945, 1947*, 3.
[83] F. van Biljon *et al*., *Report of the Commission of Enquiry into the Cattle Industry of Swaziland* (Manzini, 1962), 16.
[84] *Ibid*.

> is no selection on a production basis: the best fighter is considered to be the best bull in the herd… Bull calves are not castrated until they have grown out to animals of 3 years of age or more and it is not unusual to find the number of adult bull equal to the number of adult females in a small herd. In spite of continued propaganda by the Department of Land Utilization to encourage better animal husbandry practices, little so far has been achieved.[85]

They attributed the Swazis' unwillingness to sell Nguni bulls to the breeding centres because of Swazis' complex social relationships with cattle. Swazis only sold cattle in times of desperation and when money was otherwise unobtainable. Cattle too were integral to lobola systems, signified cultural value, wealth, social prestige, and were core to religious and spiritual customs.[86] 'To the Swazi people,' the report noted, 'cattle therefore have far greater significance than the mere economic value of the beasts'.[87] The Swazis' rejection of modernised breeding regimes the commission disparaged as 'primitive'.[88]

Why then was the uptake of colonial breeding schemes greater in Bechuanaland than in Swaziland? In part, this was likely because the Bechuanaland schemes were largely under elite, chiefly control, whereas the Swazi schemes were run by distrusted government officials. Further, before the 1930s Bechuanaland cattle keepers had received large cash payments from exporting cattle to South Africa, while the Swazi herd was smaller and their trade with South Africa less established.

Further, a combination of rinderpest in the 1890s and the imposition of colonial rule at the beginning of the twentieth century had undermined rural self-sufficiency.[89] Also, both Boer and British administrations blocked Swazi cattle raiding.[90] Stemming from the 1907 Land Partition policy, settler land alienation was also seriously disruptive, and unsustainably

[85] *Ibid*, 7.
[86] *Ibid*, 6.
[87] *Ibid*, 46.
[88] *Ibid*.
[89] H. Simelane, 'The Colonial State and the Political Economy of Famine in Swaziland, 1943–1945', *South African Historical Journal* 66, 1 (2014), 108; R. Packard, 'Maize, Cattle and Mosquitoes: The Political Economy of Malaria Epidemics in Colonial Swaziland', *The Journal of African History* 25, 2 (1984), 195.
[90] Packard, 'Maize, Cattle and Mosquitoes', 195.

confined Swazi people and cattle to smaller areas.[91] By 1911, 25% of adult Swazi males were subjected to migrant labour, mostly to farms and mines in South Africa.[92] Between 1911 and 1930 Swazi cattle herds expanded from 57 000 cattle to 297 828.[93] It seems reasonable to infer that Swazis held onto their cattle as attempts to secure self-sufficiency in the face of rupturing colonial rule.

From cattle's perspectives, the further one was from a colonial breeding centre the better. This is not to hark back to a merry Swazi past where cattle lived idyllic romanticised lives but rather to recognise that the bonds between Swazi cattle and Swazi humans, the extents to which cattle were entwined in Swazi cultural, spiritual and social lives, in part saw Swazi cattle spared from entering the rationalised and sometimes deadly colonial cattle breeding centres. Whereas colonial regimes in Swaziland, South Africa and Bechuanaland regarded cattle in exclusively productionist terms - carcass to flesh ratios, milk and butterfat yields, and calving rates – Swazis did not: and so, into the 1960s, this spared most Swazi cattle from incorporation into colonial breeding systems. By contrast, as explored later, in Bechuanaland, the Livestock Improvement Schemes, as in Britain, laid the groundwork for the development of industrialised breeding regimes premised on forced artificial inseminations.

The Bonsmara cattle breed and the human eugenics context

While colonial breeding regimes in Bechuanaland and Swaziland were developing slowly and unevenly in the 1940s and 1950s, in South Africa cattle breeding was becoming hyper data-driven. In 1940 the South African government's Division of Animal and Crop Productions pursued a policy of loaning bulls between breeding centres.[94] Its director wrote to the five agricultural colleges requesting the lineage and dates of births of pedigree cattle, their registrations, and cows' milk outputs and number of calves.[95] The case of Bonsmara demonstrates a core concept underpinning animal breeding, namely progeny testing.

[91] *Ibid*, 191, 195.
[92] *Ibid*, 196.
[93] van Biljon *et al*., *Report of the Commission of Enquiry into the Cattle Industry of Swaziland*, 3.
[94] PNA, A226/38. Colleges of Agricultural and Agricultural Research Stations - Cattle Breeding Policy, 17 August 1940.
[95] Ibid. See also PNA, A53/9, Potchefstroom College of Agriculture. Cattle Breeding Policies: Dairy and Beef Cattle Herds, 1941; PNA, A184/9 Stellenbosch Elsenburg College of Agriculture. Cattle Breeding Policies, 1940;

Bonsmara are a breed of cattle who were engineered into existence by one of southern Africa's foremost animal geneticists, Jan Bonsma.[96] Jan Bonsma studied agriculture and animal science at the University of Pretoria and animal breeding at Iowa State University. Upon his return to South Africa, in 1937, he was placed at the Mara Research Station.[97] Mara emerged because the Department of Agriculture had purchased farms west of Louis Trichardt in 1935 to establish a research station.[98] For over twenty years Jan Bonsma conducted breeding experiments with 20 commercial cattle herds.[99] These experiments culminated in the Bonsmara cattle breed. The term Bonsmara melded two concepts, Bonsma and the Mara Research Station. The *raison d'être* of Jan Bonsma's breeding projects was to produce cattle flesh cheaply:

> The whole object of genetic improvement should be to produce cheaper meat. In other words, the superior genotype should give a superior phenotype at the lowest cost possible.[100]

> Successful livestock production and ranching depend on calving and weaning percentages. The aim in livestock production is to produce the maximum amount of beef per unit area. The rancher must realize that selection is his best tool.[101]

> All the selection is based on the concept of increasing cutability rate.[102]

PNA, A39/10 Grootfontein College of Agriculture. Cattle Breeding Policies: Dairy and Beef Cattle Herds, 1941; PNA, A25/11, Glen College of Agriculture. Cattle Breeding Policies: Dairy and Beef Cattle Herds, 1940.
[96] I. Aitken, 'Bonsma Revisited', *The Luing Journal*, January 2021, 26–27.
[97] 'Life, Education & Work', *familysearch.org*, https://www.familysearch.org/service/records/storage/das-mem/patron/v2/TH-904-74804-2087-19/dist.txt?ctx=ArtCtxPublic, accessed 3 May 2021.
[98] A. van Zyl, 'Deplorable State of Mara Research Station Raises Eyebrows', *Zoutpansberger*, 19 September 2020, https://www.zoutpansberger.co.za/articles/news/53114/2020-09-19/deplorable-state-of-mara-research-station-raises-eyebrows#:~:text=The%20history%20of%20the%20Mara,station%20was%20Professor%20Jan%20Bonsma, accessed 3 April 2021.
[99] The American Bonsmara Breed, 'History of Bonsmara', *The American Bonsmara Breed*, http://www.bonsmara.com/bonsmara/, accessed 4 May 2021.
[100] J. Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed* (Pretoria: Breeders' Society's 21st Anniversary Publication, 1987), 26.
[101] J. Bonsma, *Wortham Lectures in Animal Science* (Texas: B.R Cutrer, 2020), 23.
[102] Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 18.

Cutability is the ratio of flesh to carcass; the higher the cutability rate, the more flesh, the more commercial value. The core objective of his breeding research was economic, i.e., to lower the cost of cattle flesh.

Jan Bonsma framed his animal breeding projects in contradistinction to southern African cattle-keeping societies' practices. Invoking what he imagined as his superior race, religion, and culture, grandiosely, and with granite self-assurance, he claimed that:

> Throughout the world one finds that those races who are superstitious, ignorant and prejudiced are backward in their approach to livestock improvement and the betterment of agriculture in general. The Bantu tribes in Africa consider animals to be a token of wealth and a means of acquiring a wife. These people never have regarded livestock production as a means of benefiting mankind and a method of improving the nutritional standards of their people. They have never practiced systems of selection and improved breeding with the object of producing more and better food for their own people. Likewise, to the Hindu, whose outlook on the animal is holy. These people are not permitted to castrate useless bulls; hence, they carry out no system of herd improvement whatsoever. The people of the western civilization have a cultural and religious background which stimulates improvement in livestock production.[103]

At the Mara and Messina research institutes his work engaged what he called the problem of 'tropical degenerates', namely, British cattle breeds with high mortality and low cutability rates.[104] Below is an image of what he regarded as a tropical degenerate Shorthorn cow.

[103] Bonsma, *Wortham Lectures in Animal Science*, 12.
[104] Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 3–4.

Image 5.2. Shorthorn cow disparaged by Bonsma as a tropical degenerate

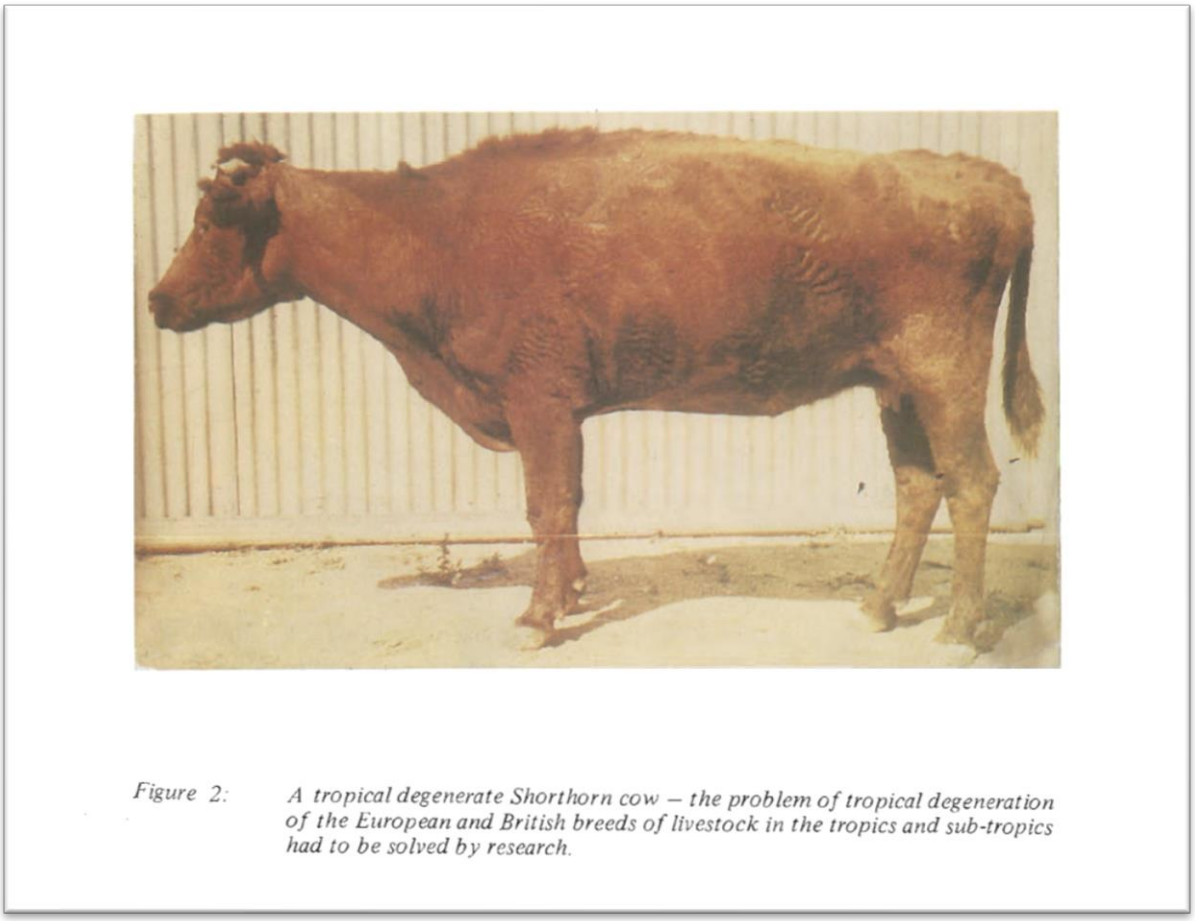


Figure 2: *A tropical degenerate Shorthorn cow – the problem of tropical degeneration of the European and British breeds of livestock in the tropics and sub-tropics had to be solved by research.*

Source: J. Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed* (Pretoria: Breeders' Society's 21st Anniversary Publication, 1987), 3.

In his breeding projects, cattle were subjected to extreme bodily surveillance. His dictum was that 'man must measure'.[105] His selection for 'functional efficiency', a concept he had learned during postgraduate work on a Texan farm, included selection criteria that comprised 14 body measurements taken every three months.[106] Cattle's weight gains, body temperatures, pulses, respiration rates, tick counts, hairs per square centimetre, hide thickness, their fertility, calving rates, milk outputs, longevity, and mortality rates were exhaustively measured.[107] In the 1940s, some 2 000 cattle each had a personal data sheet recording their performance.[108]

[105] Bonsma, *Wortham Lectures in Animal Science*, 2.
[106] Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 15.
[107] Aitken, 'Bonsma Revisited', 26.
[108] Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 15.

He noted that:

> In creating the Bonsmara breed, adaptability was measured and no inheritable defects were tolerated in the selection process. In fact, only one bull out of every six bulls kept, was selected for further breeding purposes, and only after extensive testing.[109]

Selection and elimination were two sides of the same coin. The extensive surveillance had lethal consequences for cattle.

> In selecting cattle for the Bonsmara breed, every animal that had completed a performance test, was subsequently evaluated and cattle that showed signs of hereditary weakness or defects, were immediately culled. This is the only way to eliminate defects in the breed.[110]

Bulls and cows were evaluated via different 'functional efficiency' standards. From 1940 sires were selected on the basis of performance testing. From 1946 cows were selected on the basis of calving percentages.[111] He claimed an ability to determine a female's fertility value based on her briskets, dewlaps, shoulders, chests, hipbones, and hindquarters.[112] A visual depiction of the body conformation profile of fertile versus subfertile cows that he devised follows.

[109] *Ibid*, 13.
[110] *Ibid*, 23.
[111] *Ibid*, 25.
[112] *Ibid*, 17.

Image 5.3. Jan Bonsma's depiction of fertile and sub-fertile cows

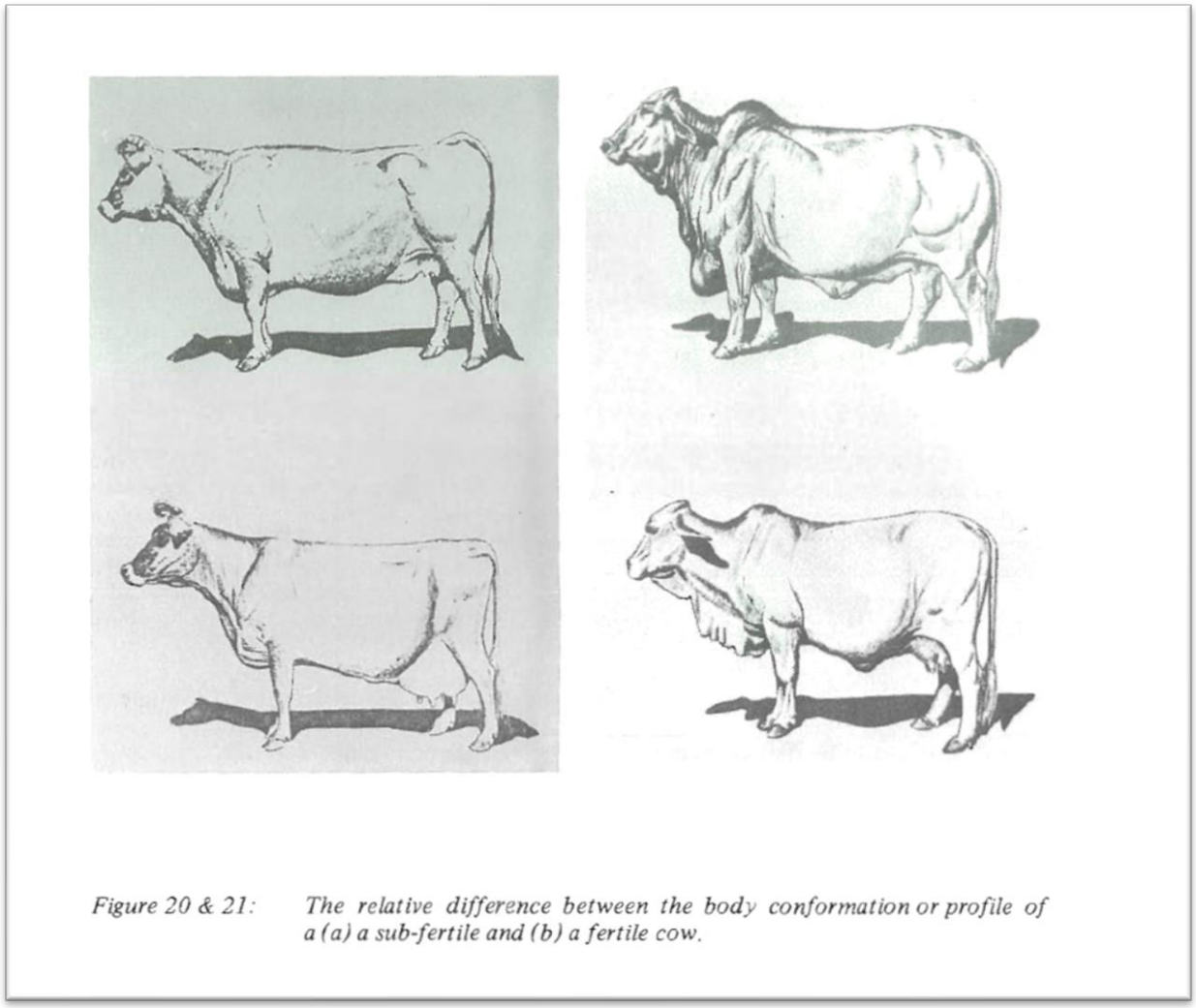


Figure 20 & 21: The relative difference between the body conformation or profile of a (a) a sub-fertile and (b) a fertile cow.

Source: Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed,* 18.

The cows on the bottom left and right were regarded as possessing fertile body types.[113] Also to measure fertility, each cow had a personal birthing datasheet. Over an eight-year period, any cow who twice failed to produce a calf during a cycle was slaughtered summarily.[114] Fertility was the single most important factor determining whether a young cow would be slaughtered.[115] He also placed a high value on the 'importance of a sound, efficient udder'.[116]

[113] Bonsma, *Wortham Lectures in Animal Science*, 53.
[114] Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 13.
[115] Bonsma, *Wortham Lectures in Animal Science*, 60.
[116] Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 17.

'Conformational features', he noted, 'such as teat shape, size, placement and udder attachment are also crucial in judging cows for functional efficiency'.[117]

Males too had specific body conformation criteria. 'Heaviness or coarseness of the forequarter,' he wrote, 'which constitutes the shoulder blades, spine and related tissues are indicative of the desirable bull.'[118] Their legs and feet were required to be 'sound'.[119] He added that the 'functional efficient bull with high fertility and sex drive has a well developed forequarter and a masculine head and neck'.[120] Further, for him, the bull needed to

> be alert and immediately cock his ears when a cow passes. It is of the utmost importance that the bull must have well developed testes with a circumference of 34 to 40 cm and a good neck to the scrotum which allows proper temperature control.[121]

Bulls at the Mara Research Station had to be able to impregnate 50 or more cows during a two and a half month breeding season, suggesting that forced artificial insemination was not the primary means of breeding cattle in the 1960s in South Africa.[122] Depictions of fertile versus sub-fertile bulls follow.

[117] *Ibid*, 18.
[118] *Ibid*.
[119] *Ibid*.
[120] *Ibid*.
[121] *Ibid*.
[122] Bonsma, *Wortham Lectures in Animal Science*, 37.

Image 5.4. Jan Bonsma's depiction of fertile and sub-fertile bulls

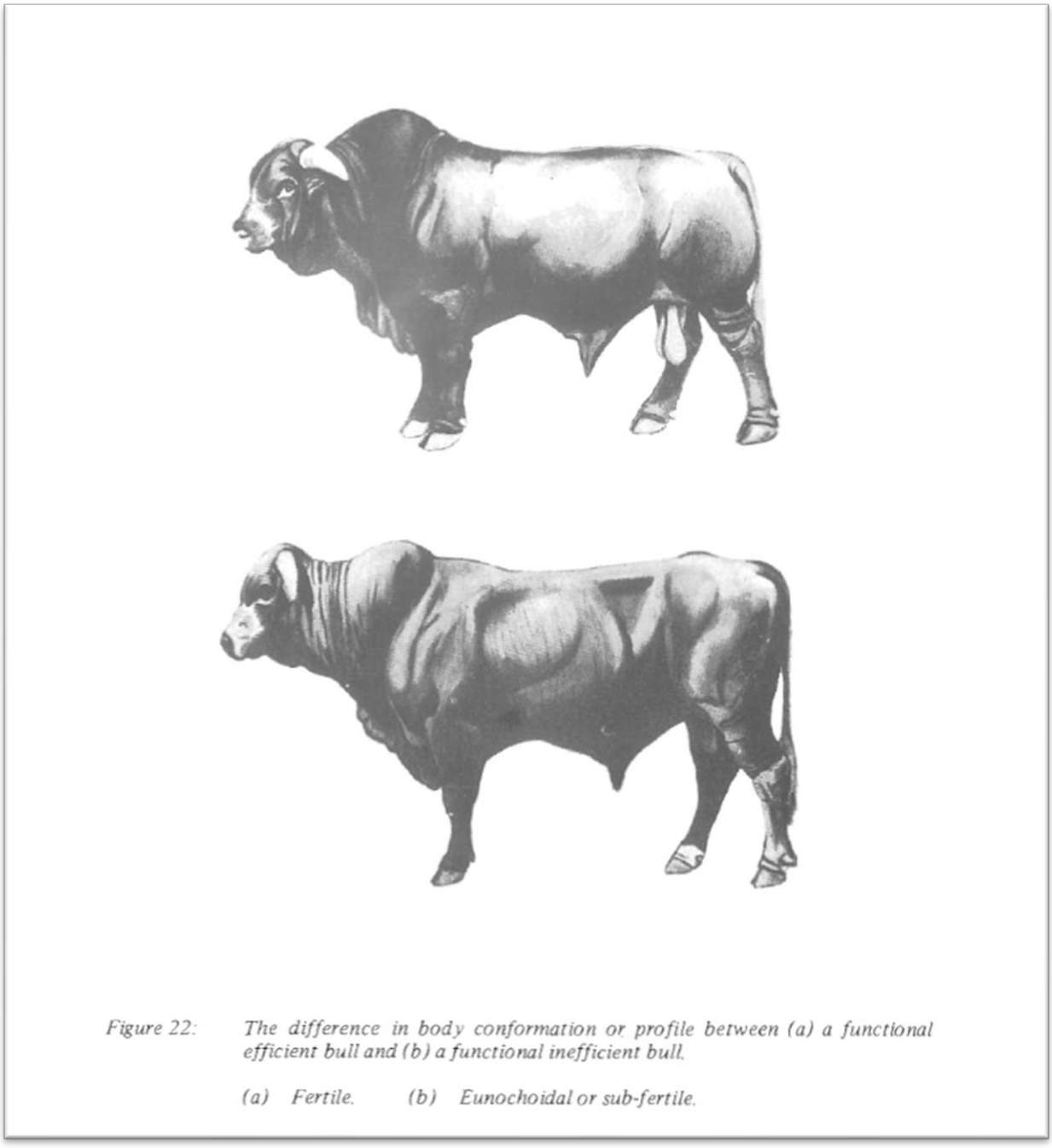


Figure 22: The difference in body conformation or profile between (a) a functional efficient bull and (b) a functional inefficient bull.

(a) Fertile. (b) Eunochoidal or sub-fertile.

Source: Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 19.

Image 5.5. Rear view depicting testes of fertile and sub-fertile bulls

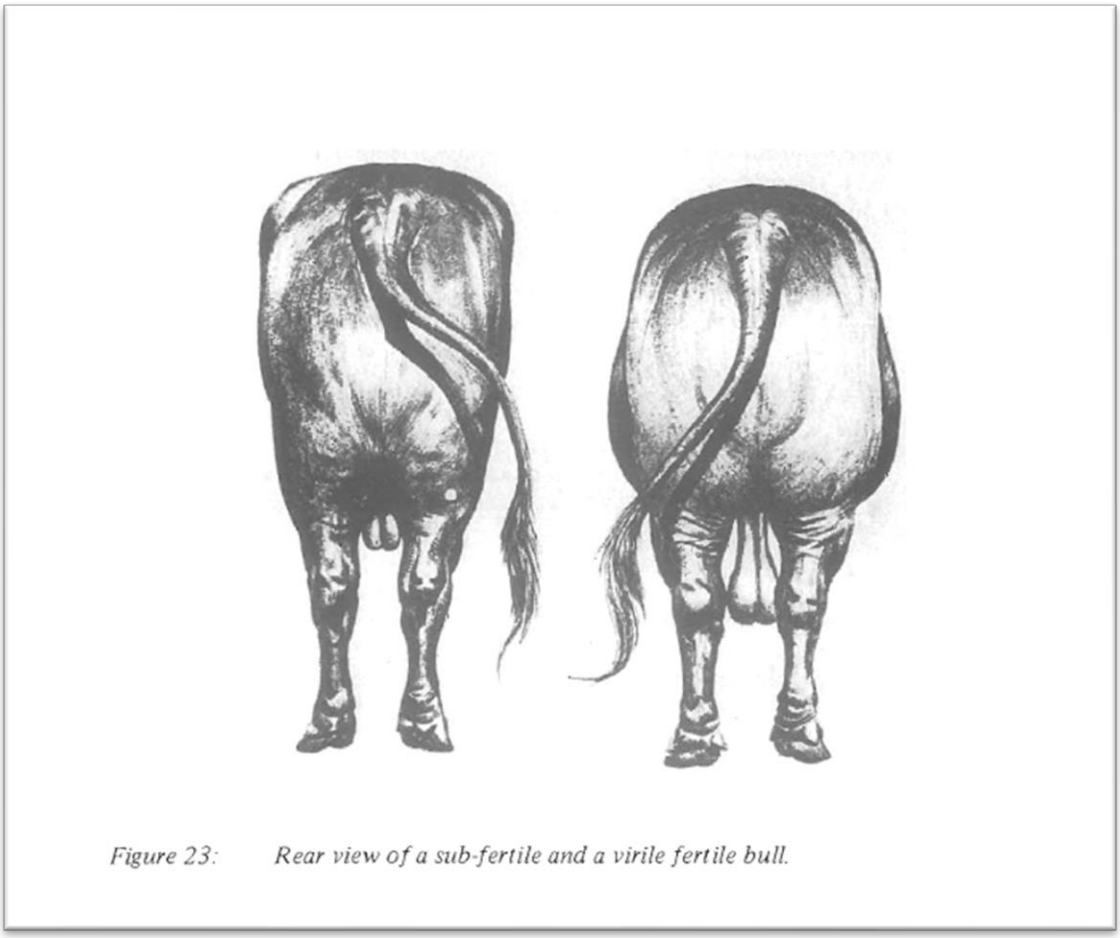


Figure 23: Rear view of a sub-fertile and a virile fertile bull.

Source: Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 20.

Interestingly, beyond physical assessments, Jan Bonsma was vividly alive to cattle's subjective aspects.

> Temperament is of the utmost importance in judging an animal for functional efficiency since animals with a bad disposition can make management difficult and often hazardous.[123]

Those cattle who were more docile were more likely to survive. He was attempting to eliminate cattle who were inclined to resist or whose affect coincided with protestatory actions. Via these data-driven breeding processes, the Bonsmara cattle breed came into being. Bonsmaras comprised 5/8th Africander, 3/16th Hereford and 3/16th Shorthorn.[124] In the

[123] Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 21.
[124] Aitken, 'Bonsma Revisited', 27.

form of a new scientifically designed and locally adapted breed, Bonsmaras symbolised the connection between southern Africa and Britain, and the latter's impact on the former. Here is an image of what Jan Bonsma considered the ideal Bonsmara bull.

Image 5.6. Jan Bonsma's ideal Bonsmara bull, Noble Gentleman

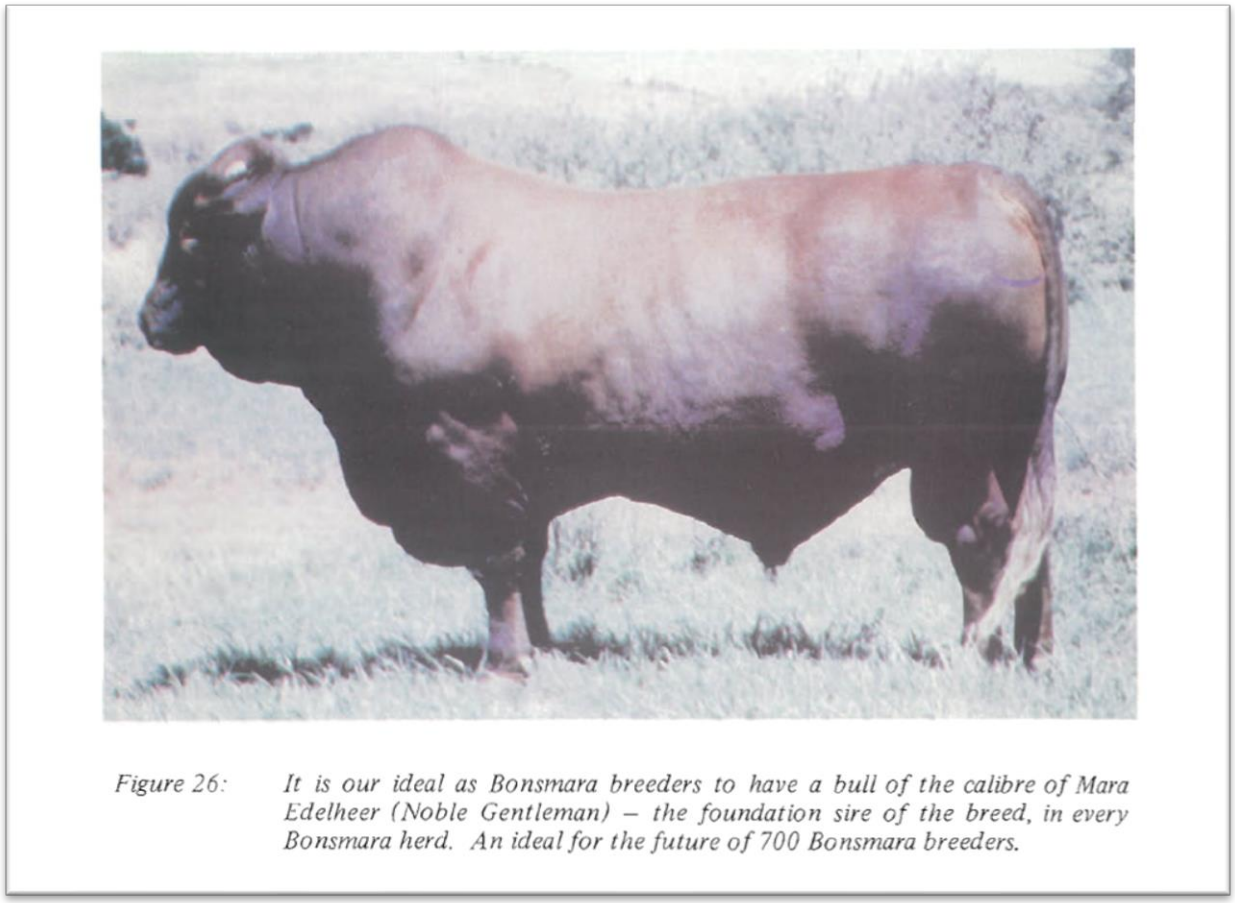


Figure 26: *It is our ideal as Bonsmara breeders to have a bull of the calibre of Mara Edelheer (Noble Gentleman) – the foundation sire of the breed, in every Bonsmara herd. An ideal for the future of 700 Bonsmara breeders.*

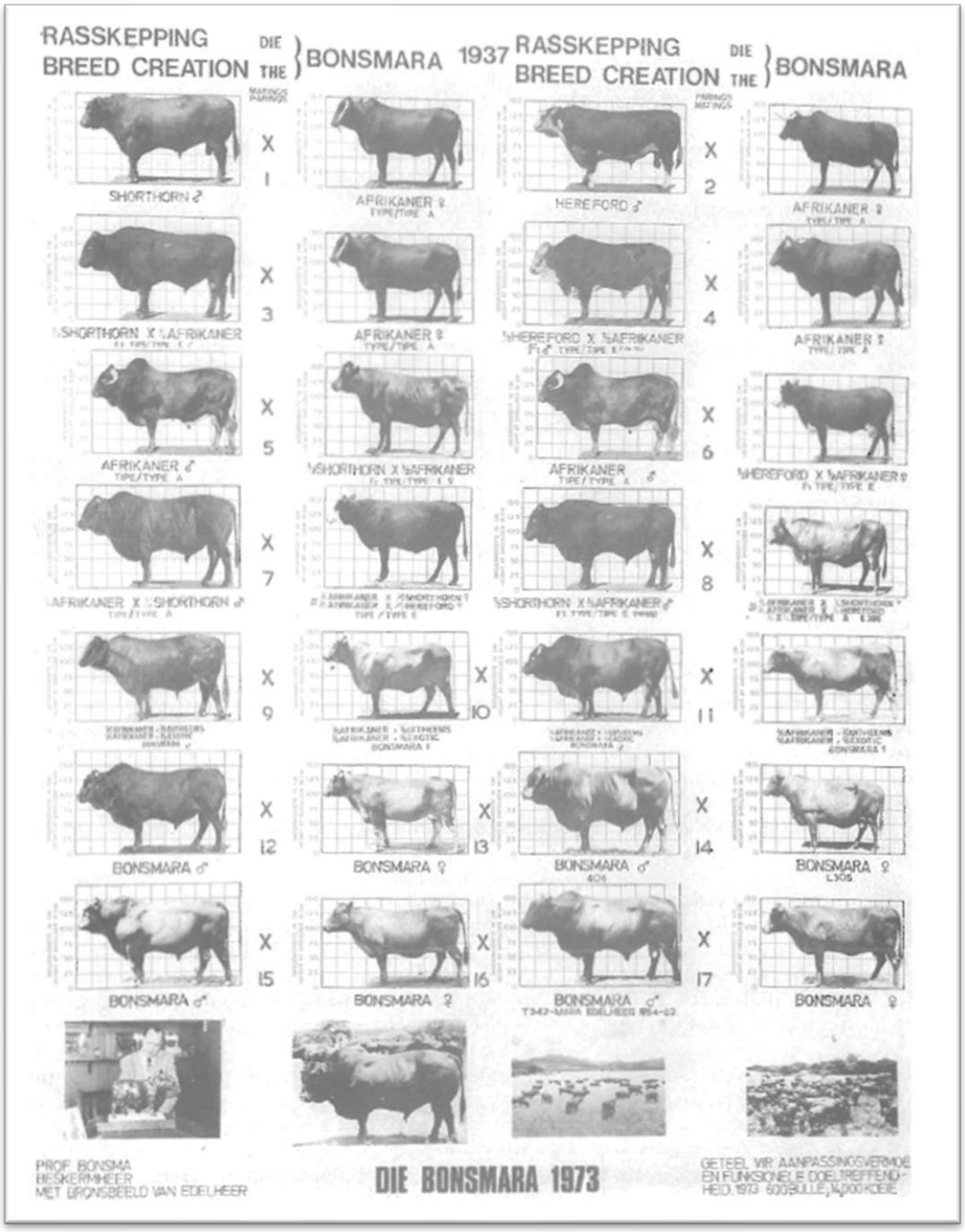
Source: Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 23.

In 1953, Jan Bonsma announced that a new breed of cattle, Bonsmara had been created.[125] In time Bonsmara would become South Africa's predominant breed raised under feedlot systems.[126] Bonsmara today are farmed in three continents. A Bonsmara cattle breeding society would later claim that 'Bonsmara is the only breed in the world that can boast a

[125] van Zyl, 'Deplorable State of Mara Research Station Raises Eyebrows.'
[126] M. Scholtz *et al*., 'Results of the National Cattle Survey Undertaken in South Africa, with Emphasis on Beef', *Applied Animal Husbandry & Rural Development* 1 (2008), 6.

pictorial genealogy from the very beginning of the breeding work until the new breed was established'.[127] A summarised visual depiction of this process follows.

Image 5.7. Seven generations of cattle bred to be a Bonsmara



Source: Bonsma, *Jan Bonsma and the Bonsmara Cattle Breed*, 14.

[127] The American Bonsmara Breed, 'History of Bonsmara', *The American Bonsmara Breed*, http://www.bonsmara.com/bonsmara/, accessed 4 May 2021.

The breeding system involved consequential ideas of inferior and superior genes, and desirable and undesirable hereditary traits. From a bovine perspective, it was a form of cattle eugenics.

Many of the ideas underpinning cattle eugenics programmes also underpinned human eugenics programmes. In the book that galvanised human eugenics thinking, *Hereditary Genius* (1896), Francis Galton argued that:

> It is easy… to obtain by careful selection a permanent breed of dogs or horses gifted with peculiar powers of running, or doing anything else, so it would be quite practicable to produce a highly-gifted race of men by judicious marriages during consecutive generations.[128]

He frequently compared human and animal breeding. Francis Galton later distinguished between positive and negative eugenics. Abstractly stated, positive eugenics increased the proportion of persons with desirable traits while negative eugenics decreased the proportion of those with undesirable traits.[129] In the early twentieth century, eugenics practices for humans commanded wide support and appeal in many countries, including at the state level. Governments in Sweden, Denmark, and Finland enacted eugenics sterilisation programmes in the early twentieth century.[130] Human eugenics ideas and movements were influential in Britain, New Zealand, Australia, China, Hong Kong, Kenya, South Africa France, Germany, the Netherlands, the Soviet Union, Iran, Japan, Cuba, Puerto Rico, Mexico, Brazil, the United States, and Canada, for example.[131]

In the United States by the end of the 1920s, more than half of the states in America had legalised compulsory sterilisations for those people they considered unsuitable to reproduce.[132] Such people included those who were classified as cognitively deficient, insane,

[128] Turner, *Animal Breeding, Welfare and Society*, 295.
[129] D. Paul and J. Moore, 'The Darwinian Context: Evolution and Inheritance', in A. Bashford and P. Levine (eds.), *The Oxford Handbook of the History of Eugenics* (Oxford: Oxford University Press, 2010), 28–30.
[130] Turner, *Animal Breeding, Welfare and Society*, 296.
[131] A. Bashford and P. Levine (eds.), *The Oxford Handbook of the History of Eugenics* (Oxford: Oxford University Press, 2010).
[132] Patterson, *Eternal Treblinka: Our Treatment of Animals and the Holocaust*, 88.

epileptic, sexual offenders, or repeat criminals. By 1941, over 30 000 people had been legally sterilised in the United States.[133]

The appeal and support of human eugenics lost much of its force in the mid-twentieth century. After WWII, specific human rights enshrined reproductive and marriage freedoms as inalienable. But for cattle no rights were enshrined. As human eugenics declined but did not disappear after WWII, so cattle eugenics accelerated rapidly.[134]

Modernised cattle breeding in Botswana and South Africa in the context of the global proliferation of FAI

In Bechuanaland, the Colonial Development Fund was integral to modernising the cattle industry. Against the backdrop of implementing Livestock Improvement Schemes in the 1930s, in the late 1940s the CDF set up a matrix of cattle 'fattening' operations on Crown land in Odiakwe, Nata, and Pandamatenga.[135] Also in the 1940s demand for cattle flesh on the Northern Rhodesian Copperbelt mines, in the Congo, and Southern Rhodesia, saw Bechuanaland expand its cattle flesh exports.[136] During WWII British demand for South African cattle flesh increased suddenly, and absent excess supply saw many cattle from Bechuanaland transported to slaughterhouses in Kimberley, Durban and Bulawayo in order to be exported to the United Kingdom.[137] Cattle exports increased markedly from the 1940s to the early 1960s, alongside borehole drilling schemes and veterinary fences to control disease outbreaks.[138] Cattle exports in Bechuanaland were closely tied to the Colonial Development Corporation (CDC).[139] Managed and supported by the CDC, the opening of the Lobatse slaughterhouse in 1955 signalled a shift towards globalising Bechuanaland's cattle

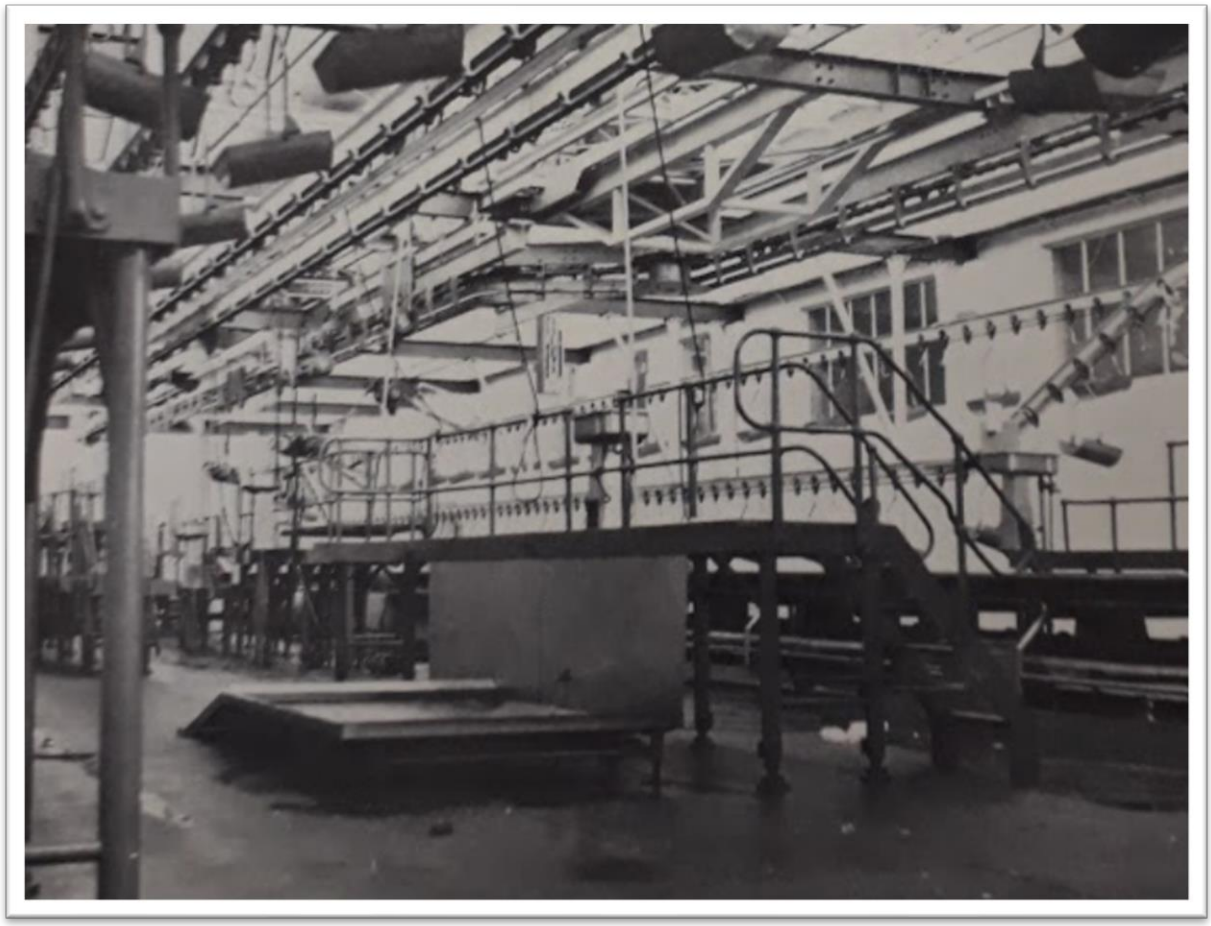
[133] Turner, *Animal Breeding, Welfare and Society*, 297.
[134] For information on human eugenics after WWII, see M. Thomson, 'Psychiatry, Disability, and Eugenics after World War II', in A. Bashford and P. Levine (eds.), *The Oxford Handbook of the History of Eugenics* (Oxford: Oxford University Press, 2010), 116–33.
[135] M. Darkoh and J. Mbaiwa, 'Globalisation and the Livestock Industry in Botswana', *Singapore Journal of Tropical Geography* 23, 2 (2002), 153.
[136] *Ibid*, 152.
[137] *Ibid*, 153.
[138] Hillbom, 'Cattle, Diamonds and Institutions', 166.
[139] The CDC was renamed the Commonwealth Development Corporation in 1963.

flesh exports and modernising its cattle industry.[140] In this respect cattle slaughter in Bechuanaland became industrialised four decades later than in South Africa, as we saw in Chapter Four. In 1959 a proclamation prohibited new competitor slaughterhouses opening without a license, and the next slaughterhouse only opened in 1983, 640 kilometres north of Lobatse in Maun.[141] The centralised Lobatse slaughterhouse enabled access to southern African markets, the UK, and later the European market.[142] The number of Batswana who sold cattle directly to Lobatse increased from 12 in 1954 to 1 500 in 1962, which indicates an increase of cattle sellers and that cattle selling was no longer the preserve of a numerically minuscule chiefly elite.[143]

The Lobatse slaughterhouse was in 1963 co-owned by the Commonwealth Development Corporation (formerly Colonial Development Corporation) which held 50% of shares, and the Bechuanaland Government and the Livestock Producers' Trust, which each held 25% of shares.[144] Lobatse comprised the sole export slaughterhouse.[145] In 1965 the Lobatse slaughterhouse was modernised. In that year it reported a record daily slaughter rate of 1 226 animals, or more than two per minute in an eight-hour day.[146]

[140] A. Samatar and S. Oldfield, 'Class and Effective State Institutions: The Botswana Meat Commission', *The Journal of Modern African Studies* 33, 4 (1995), 660.
[141] *Ibid*, 660, 662.
[142] Darkoh and Mbaiwa, 'Globalisation and the Livestock Industry in Botswana', 152.
[143] T. Tlou and A. Campbell, *History of Botswana* (Gaborone: Macmillan, 1997), 275.
[144] BNA, BNB 4750 ARC 472.29, Price Waterhouse & Co, *The Livestock Industry of the Bechuanaland Protectorate, Report*, Price Waterhouse & Co, 1963, 4.
[145] Samatar and Oldfield, 'Class and Effective State Institutions', 662.
[146] BNA, BNB 969, Botswana Meat Commission, *Reports and Accounts*, 1966, 4.

Image 5.8. Inside of Lobatse slaughterhouse in 1965



Source: BNA, BNB 969, Botswana Meat Commission, *Reports and Accounts*, 1966, 4.

In 1965 the Botswana Meat Commission (BMC) was established.[147] The Lobatse slaughterhouse complex was nationalised at Botswana's independence in 1966.[148] The BMC enacted a monopoly where all cattle for slaughter or export were purchased by the BMC. From its inception in 1966, the BMC increased the cattle throughput – the cattle it slaughtered or sold – from 150 000 to 239 293 in less than two decades.[149]

[147] E. Roper, *Report of the Commission of Inquiry into Certain Matters Related to the Botswana Meat Commission* (National Assembly of the Republic of Botswana, 1967), 2.
[148] Samatar and Oldfield, 'Class and Effective State Institutions', 661.
[149] *Ibid*, 662.

Image 5.9. Botswana Meat Commission in Lobatse, 1967

Source: BNA, BNB 969, *Reports and Accounts*, 1966, 3.

At independence in 1966, live cattle and cattle flesh exports comprised 85% of total export revenue.[150] From just over a million in 1965, in the decade after independence the cattle population in Botswana grew to 2.5 million.[151] Botswana's five-year plan (1968-1972) apportioned 60% of its agricultural budget towards 'livestock and animal health'.[152]

The Colonial Development Fund and the Bechuanaland government were involved in virtually every aspect of modernising the cattle trade, including breeding schemes, fattening projects, veterinary fences, drilling boreholes, funding and operating a centralised slaughterhouse, and connecting Bechuanaland cattle to the UK market. What became Botswana's cattle economy was a colonial project started in the 1930s via LISs and borehole drilling projects. In terms of

[150] J. Bolt and E. Hillbom, 'Long-Term Trends in Economic Inequality: Lessons from Colonial Botswana, 1921–74', *The Economic History Review* 69, 4 (2016), 1269.
[151] E. Roe, *Development of Livestock, Agriculture, and Water Supplies in Botswana before Independence* (Ithaca: Cornell University, 1980), 2; Hillbom, 'Cattle, Diamonds and Institutions', 168.
[152] Darkoh and Mbaiwa, 'Globalisation and the Livestock Industry in Botswana', 154.

breeding, for cattle the next major developments were forced artificial insemination schemes and intensive performance tests.

From 1967 forced artificial insemination was deployed against cattle in Botswana.[153] Forced artificial insemination comprised a breeding development that had its roots in the colonial livestock improvement centres from the 1920s.[154] This development – FAI centres being mapped onto LIC infrastructure – mirrored in part what had happened in the United Kingdom. For cattle in the United Kingdom, the impact of artificial insemination was dramatic. From the 1930s researchers at the University of Cambridge started developing forced artificial insemination procedures for cattle.[155] Over the next two decades, a matrix of FAI centres had been implemented across England and Wales, such that FAI was available to every cattle farmer; each FAI centre was linked to a cow population of 60 000.[156] Certain highly desirable bulls were moved between centres to ensure 'rotational crossbreeding'.[157] The matrix of FAI centres was linked to the UK's centralised milk records data, and enabled national progeny testing. In England and Wales, in 1951 20% of cows were impregnated via FAI – by 1958 58% of all cows were impregnated by FAI.[158] Under the auspices of the UK's Milk Marketing Board, it was the largest FAI system in the world under a single body.[159] This extremely vast coverage was enabled by the Livestock Improvement Scheme which had been operating for the previous three decades, and without which the FAI network in the UK would have been 'unthinkable'.[160] From one FAI centre in 1944/5 which impregnated 2599 cows, in 1957/8 there were 22 centres impregnating 1 399 349 cows.[161]

Modern cattle breeding has been discussed as a core feature of fascist states in the twentieth century. Tiago Saraiva specifically explored how FAI was used by fascist European regimes as

[153] J. Moreki, T. Pelaelo-Grand, and A. Ranko, 'Artificial Insemination in Botswana: Challenges and Opportunities – A Review', *Journal of Animal Science and Veterinary Medicine* 4, 4 (2019), 122.
[154] Mocheregwa, 'Artificial Insemination and the Cattle Industry in Botswana, 1960-2011', 109.
[155] Wilmot, 'From "Public Service" to Artificial Insemination', 423.
[156] *Ibid*, 411.
[157] *Ibid*, 428.
[158] *Ibid*.
[159] *Ibid*.
[160] *Ibid*, 422–23.
[161] *Ibid*, 429.

part of their colonial regimes in Angola, Ethiopia, Libya, and Libya.[162] He regarded artificially inseminated sheep as 'materialized fascist ideology.'[163] Analysing FAI programmes that were imposed on sheep in Libya under Italian occupation, he highlights that in 1939, 1 592 Barbaresca ewes (Italian sheep) were artificially inseminated through a process that involved:

> four basic steps of artificial insemination—collecting, diluting, conserving, and inseminating proper—[which] were to be undertaken under strictly standardized procedures.[164]

Over-foregrounding the standardisation aspect, what forced artificial insemination meant for the ewes and rams disappears. Animals' experiences of fascism and colonialism in Africa remain unarticulated. Tiago Saraiva summarises the impact of FAI on sheep in Cyrenaica, Libya, as comprising 'obligatory passage points'. He writes:

> we can say that artificial-insemination centers worked as obligatory passage points for the performance of colonial relations. Determining which animals would be allowed to reproduce and which would be eliminated from a herd meant intervening at the core of indigenous life… colonial domination meant breaking the relations between natives and their animals. In terms likely to be familiar to present-day scholars of Science Studies, control of animal reproduction constituted an obligatory passage point translating questions of colonial power and political independence.[165]

For animals, FAI was far more than an obligatory passage point. From animals' perspectives, the expansion and coverage of forced artificial insemination from the mid-twentieth century plausibly comprised the most transformative development in domesticated animals' history. In terms of its impact on animals, the artificial insemination of domesticated animals is probably the most significant development since the agricultural revolution. This is because artificial insemination enables the reproduction of animals to become industrialised. Experientially, it involved forcibly extracting semen from males and forcibly impregnating females. Forced artificial insemination rapidly and vividly increased the commercial value of farmed animals, and the technology spread with celerity across the globe.

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[162] Saraiva, *Fascist Pigs: Technoscientific Organisms and the History of Fascism*, 211–12, 214, 216, 226, 230, 234.
[163] *Ibid*, 3.
[164] *Ibid*, 214.
[165] *Ibid*, 215.

In June of 1948, the 'First International Congress of Physiology and Pathology of Animal Reproduction and of Artificial Insemination' was hosted in Milan by the Lazzaro Spallanzani Italian Experimental Institute for Artificial Insemination and the University of Milan.[166] Lazzaro Spallanzani in 1789 had published about impregnating a spaniel with a small cannula, and is regarded as one of the first people to artificially impregnate a mammal.[167] Previously, Telesforo Bonadonna, who directed the Lazzaro Spallanzani institute, had visited artificial insemination centres in fascist Germany and the Soviet Union and returned with instruments to start inseminating cows and sheep.[168] At the conference were 600 attendees, representing over 80 countries and six continents.[169] There were lectures on experiments in Kenya, Uruguay, Sweden, and Denmark. A total of 224 papers were presented.[170]

One of the most significant English texts on artificial insemination from the mid-1940s to the late 1960s is Enos Perry's edited volume, *The Artificial Insemination of Farm Animals* (1945). Its fourth edition in 1968 was the book's 11th reprint. The 1968 editor's forward gave a sense of the global and commercial impact of artificial insemination. It noted that in 1967 over a dozen countries were artificially breeding between 50 and 98% of cows.[171] In 1964 the New Zealand Dairy Production and Marketing Board reported an annual increase of 11.3 kilograms of butterfat per cow from artificial breeding.[172] In Denmark between 1939-40 and 1964-65 cows' annual milk outputs on average each rose from 3 505 to 4 765 kilograms.[173] In the United States cattle raised for their flesh, 'beef cattle', doubled in commercial value in the mid-1960s. The financial incentives for governments were therefore considerable. The scale of artificial breeding reached unprecedented levels. By 1966 one bull in the United States had

[166] B. Morgan, 'First International Congress of Physiology and Pathology of Animal Reproduction and of Artificial Insemination', *Science* 108 (1948), 465–66.
[167] B. Orland, 'The Invention of Artificial Fertilization in the Eighteenth and Nineteenth Century', *History and Philosophy of the Life Sciences* 39, 2 (2017), 10–11.
[168] Saraiva, *Fascist Pigs: Technoscientific Organisms and the History of Fascism*, 213.
[169] T. Bonadonna, 'A World Survey of Artificial Breeding I. Development and Organization', *British Veterinary Journal* 125, 10 (1969), 518.
[170] Morgan, 'First International Congress of Physiology and Pathology of Animal Reproduction and of Artificial Insemination', 465.
[171] E. Perry, 'Editor's Forward' in E. Perry (ed.), *The Artificial Insemination of Farm Animals* (New Jersey: Rutgers University Press, 1968), vii.
[172] *Ibid*.
[173] *Ibid*.

been used to forcibly impregnate 350 000 cows.[174] Telesforo Bonadonna's global survey of FAI suggested that 69 702 422 cows had been forcibly artificially inseminated in 1967.[175] In the 1960s over 50% of all cows were artificially inseminated in the Netherlands, Bulgaria, Denmark, France, Finland, East Germany, Japan, the USSR, Sweden, and Hungary.[176] The book provided information and practical examples regarding how to forcibly artificially inseminate cattle, horses, donkeys, buffaloes, sheep, goats, pigs, chickens, turkeys, dogs, and honeybees.[177] FAI use was by the 1960s most widely adopted and on large scale in Britain, the United States, Netherlands, France, West Germany, the Scandinavian countries, and Canada.[178] In South Africa, as discussed below, FAI emerged in the 1930s, was regulated by the state in the 1950s, and was established by the 1960s, whereas in Botswana FAI emerged shortly after political independence. In Botswana's case, discussed later, colonial breeding regimes were intensified after political independence.

Forced artificial insemination was different for bulls and cows. Forced ejaculations were imposed on bulls every five to seven days for older bulls, or once every seven to ten days for younger bulls.[179] The three methods were, masturbating the bull by massaging his ampullae, compelling a bull to inseminate into an artificial vagina, and electroejaculation.[180] Electroejaculation was first developed in 1936 and was more commonly deployed from the 1950s.[181] By the late 1960s many electroejaculators were commercially available.[182] Describing how to use electroejaculators on bulls, John Almquist noted that the process involved:

[174] E. Perry, 'Historical Background', in E. Perry (ed.), *The Artificial Insemination of Farm Animals* (New Jersey: Rutgers University Press, 1968), 7.
[175] Bonadonna, 'A World Survey of Artificial Breeding I. Development and Organization', 519.
[176] Perry, 'Historical Background', 7.
[177] Perry, 'Editor's Forward', xi–xii.
[178] Bonadonna, 'A World Survey of Artificial Breeding I. Development and Organization', 518.
[179] S. van Rensburg, 'Pitfalls of Artificial Insemination and Semen Examination', *Journal of the South African Veterinary Association* 21, 4 (1950), 190.
[180] J. Almquist, 'Dairy Cattle', in E. Perry (ed.), *The Artificial Insemination of Farm Animals* (New Jersey: Rutgers University Press, 1968), 94.
[181] R. Gunn, *Fertility in Sheep: Artificial Production of Seminal Ejaculation and the Characters of the Spermatozoa Contained Therein* (Melbourne: Council for Scientific and Industrial Research, 1936); P. Dziuk, E. F. Graham, and W. Petersen, 'The Technique of Electroejaculation and Its Use in Dairy Bulls', *Journal of Dairy Science* 37, 9 (1954), 1035–41.
[182] Almquist, 'Dairy Cattle', 105.

> inserting a probe or electrode into the bull's rectum and stimulating nerves to the reproductive system by gradually increasing voltage in rhythmic fashion with a rheostat over a period of three to five minutes.[183]

He cautioned that the 'electrostimulation often causes straining and muscle tetany' and that 'the bull may go to his feet'.[184] He recommended that bulls 'should be restrained in a chute or stocks and provided with good footing to avoid injury'.[185] Because bulls bucked and kicked furiously, they had to be constrained by nose rings attached to ropes that could be pulled at any moment. This indicates they were in states of agitation and distress. They likely experienced excruciating discomfort and pain. For this reason, from the mid-1950s some inseminators started to feed bulls antipsychotic tranquilisers before electroejaculating them. The psychoactive tranquiliser used on bulls after the mid-1950s was Chlorpromazine.[186] First synthesised in 1951, Chlorpromazine was the earliest antipsychotic medication.[187] It was framed as a 'neurovegetative stabilizer' and it established the field of psychopharmacology.[188] It enabled the discovery of antidepressants like imipramine, Prozac, Valium, and Ritalin.[189] Chlorpromazine was distinguished from other sedatives and barbiturates in that it left motor reflexes intact, but blocked avoidance responses.[190] Rats who were fed earlier iterations of this drug were unresponsive to electric shocks.[191]

In humans, Chlorpromazine is used to treat schizophrenia and manic depression, and is powerful enough to relieve hallucinations and delusions.[192] For bulls it functioned as a chemical straitjacket. Various studies from 1954 recommended using this antipsychotic medication on bulls during electroejaculation because it reduced 'straining and tetany',

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[183] *Ibid*.
[184] *Ibid*.
[185] *Ibid*.
[186] P. Dziuk *et al*., 'Some Observations in Collection of Semen from Bulls, Goats, Boars and Rams by Electrical Stimulation', *Veterinary Medicine* 49 (1954), 455–58; R. Lundvall and R. Campbell, 'Chlorpromazine Hydrochloride for the Examination of the Penis in Bulls', *Journal of the American Veterinary Medical Association* 131, 2 (1957), 86–87.
[187] T. Ban, 'Fifty Years Chlorpromazine: A Historical Perspective', *Neuropsychiatric Disease and Treatment* 3, 4 (2007), 495; D. Healy, *The Creation of Psychopharmacology* (Cambridge: Harvard University Press, 2002), 2.
[188] Ban, 'Fifty Years Chlorpromazine', 495–96; Healy, *The Creation of Psychopharmacology*, 2.
[189] Healy, *The Creation of Psychopharmacology*, 2.
[190] Ban, 'Fifty Years Chlorpromazine', 497.
[191] Healy, *The Creation of Psychopharmacology*, 80.
[192] Ban, 'Fifty Years Chlorpromazine', 495.

reduced their tendency to extend their rear legs, and its generally powerful sedative effects.[193] It also 'extended the period of usefulness of aged or injured bulls'.[194]

For cows, by the 1960s there were two primary forced artificial insemination methods, the speculum and the rectovaginal methods.[195] After WWII the latter method largely replaced the former because it yielded higher birth rates.[196] The speculum method involved a glass or metal speculum, an inseminating tube, and a light. A sterile lubricated speculum was inserted into the vagina and cervix. Thereafter an inseminating tube was inserted through the speculum 'and into the external uterine…or the posterior part of the cervical canal as far as possible'.[197] For the rectovaginal method, the primary instrument was an inseminating tuber or catheter 5-6 mm in diameter and 40-45 cm long. The method comprised a twelve-step process. For step nine the instructions were:

> with the hand in the rectum, press downward on the rectal wall, grasp the cervix, and guide the tube into external uterine os (mouth of cervix) with aid of thumb and little finger around posterior end of cervix.[198]

FAI comprised extreme violations of cows' and bulls' bodily integrity and dignity. FAI is a bedrock feature of modern animal agriculture. Sometimes, in order to teach humans how to perform this procedure, stains or dyes were placed in the insemination device. Cows were inseminated, then slaughtered, and then their reproductive organs were removed. These were then examined to determine where the insemination had occurred.[199]

In 1959 a South African veterinarian reported that one veterinarian at an international veterinary conference in London claimed that inseminators should perform between 800 and 1 000 forced inseminations before the inseminators could be regarded as 'experienced and

[193] M. Wells *et al*., 'Effect of Method of Semen Collection and Tranquilization on Semen Quality and Bull Behavior', *Journal of Dairy Science* 49, 5 (1966), 500.
[194] *Ibid*.
[195] Almquist, 'Dairy Cattle', 128.
[196] *Ibid*.
[197] *Ibid*, 130.
[198] *Ibid*, 128–30.
[199] G. King and J. Macpherson, 'Observations on Retraining of Artificial Insemination Technicians and its Importance in Maintaining Efficiency', *The Canadian Veterinary Journal* 6, 4 (1965), 83–85.

efficient'.[200] By its fourth edition, *Artificial Inseminations for Farm Animals* (1968) contained no mention of medicating cows with tranquilisers during forced artificial inseminations.[201] Counterfactually, if forced artificial inseminations were imposed onto humans it would unflinchingly be called industrialised rape. Were electroejaculations imposed on male humans it would unflinchingly be called industrialised torture. For humans, after WWII fascism in Europe was largely halted. For animals, this core aspect of European fascist regimes, modernised animal breeding, was expanded and intensified, and became a basis of many modern states' animal agriculture systems.

Prized breeding bulls were isolated from their kin and blocked from pursuing their species-characteristic flouring. They were condemned to a life of traumatising, often electric sexual abuse. Cows too were stripped away from their kin and calves, which involved all the psychological and physical distress which accompanies the destructions of cattle's social bonds. Cows used for breeding were physically and sexually violated – repeatedly, forcibly impregnated, and reduced to rapid, birthing machines. Cattle's life cycles became strictly and tyrannically controlled on the basis of birth rates, milk yields, flesh to carcass ratios, or more generally the economic value of their progeny.

In Africa, forced artificial insemination emerged more slowly than in Europe. It was in use in Kenya in 1935, in Libya and Ethiopia in the 1930s, Angola in 1947, Rwanda and Burundi by 1964, Tunisia by 1965, Namibia in 1972, and Lesotho in 1977.[202] Swaziland's post-WWII plans included resources for forcibly artificially inseminating cattle and there is evidence that cattle used for dairy were subjected to this later.[203] As we have seen, colonists in southern Africa

[200] van Rensburg, 'Pitfalls of Artificial Insemination and Semen Examination', 189.
[201] Perry, *The Artificial Insemination of Farm Animals*.
[202] J. Anderson, 'Artificial Insemination and Community Breeding of Cattle', *The East African Agricultural Journal* 8, 1 (1942), 4; Saraiva, *Fascist Pigs: Technoscientific Organisms and the History of Fascism*, 214,216; Bonadonna, 'A World Survey of Artificial Breeding I. Development and Organization', 521; B. Moore, 'Smuggled Sheep, Smuggled Shepherds: Farm Labour Transformations in Namibia and the Question of Southern Angola, 1933–1975', *Journal of Southern African Studies* 47, 1 (2021), 109, 111; H. Schneider, 'The History of Veterinary Medicine in Namibia', *Journal of the South African Veterinary Association* 83, 1 (2012), 8; 'Lesotho Agricultural Sector Investment Programme. Working Paper 4B Intensive and Extensive Livestock Production Agricultural Diversification' (Lesotho, 1997), 4.
[203] A. Dlamini, C. Malima, and Z. Hlandze, 'Farmers' Perceptions of Socio-Economic Biosafety Considerations Regarding Adoption and Use of Biotechnology: A Case Study of Sithobeleni and Lesibovu Communities in Swaziland', *Journal of Scientific Research & Reports* 8, 4 (2015), 8; SNA, Acc. no 881. 630.2683, Swaziland Policy

were wont to disparage indigenous southern Africans as primitive and inferior where they were disinclined to adopt these practices.

In South Africa, John Quinlan and colleagues started afflicting merino sheep with forced artificial inseminations at the Onderstepoort Veterinary Research Institute in 1932.[204] Until the late 1940s, FAI was used against animals on a small scale in South Africa, mainly at research and experimentation centres.[205] From 1948 farmers and breeders increasingly used FAI.[206] Whereas in Britain, FAI centres were controlled and run as state operations, in South Africa during the 1950s and 1960s, FAI was conducted by farmers' co-operatives.[207] John van der Byl in Irene, in south Pretoria, for example did much to promote the Transvaal Artificial Insemination Co-operative during this time, specifically to expand cows' milk production.[208] The first law to regulate FAI in South Africa was the Artificial Insemination of Animals Act of 1954.[209] It enabled the establishment of an Artificial Insemination Board, comprising two members nominated by the South African Agricultural Union, two milk producers' representatives, six representatives of animal breeding associations, while the remaining three to five members had to be officials from the Agricultural Department. The Act required FAI operations to apply to the board to secure a registration certificate, and enabled state officials to inspect such facilities. But the Act did not standardise or specify insemination procedures, nor did it place any specific restrictions on how FAI was carried out, nor were animals protected by this law in any way.[210] The board, impelled by desires to increase the productive and economic value of farmed animals, was thus given considerable power to determine which FAI procedures were permissible, in accordance with their motives.

Particularly in light of the 'intensification of cattle and swine breeding', by the 1960s South African veterinarians were well aware of the veterinary use of narcotics, barbiturates,

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and Plans for the Immediate and Post-war Development of Animal Industry, Agriculture, and Forestry, 1945, 33, appendix 1.

[204] J. Quinlan, H. Steyn, and D. De Vos, 'Observations on Artificial Insemination of Sheep with Fresh and Stored Semen', *Onderstepoort Journal of Veterinary Science and Animal Industry* 16, 1 and 2 (1941), 264.

[205] van Rensburg, 'Pitfalls of Artificial Insemination and Semen Examination', 187.

[206] *Ibid*.

[207] I. Geldenhuys, 'The Development of Agricultural Co-Operation in South Africa', *Agrekon* 1, 3 (1962), 19.

[208] D. van der Byl, 'A Short History of Irene', *Pretoriana* 42 & 43 (1963), 21.

[209] Union of South Africa, *Artificial Insemination of Animals Act, 1954*.

[210] *Ibid*.

analgesics, and antipsychotic drugs such as Chlorpromazine.[211] And by the late 1950s researchers at Onderstepoort were promoting the use of convenient electroejaculators for bulls and rams. W. de Vos even connected a bicycle wheel and a generator to an electroejaculator and obtained a 6-volt current with which to electroejaculate rams and bulls in the field.[212] In 1964 South Africa artificially inseminated at least 315 000 cows.[213]

[211] O. Dietz, 'Modern Narcosis in Horses, Cattle and Swine', *Journal of the South African Veterinary Association* 31, 2 (1960), 315.
[212] W. van Rensburg, 'A Convenient Type of Electro-Ejaculator for Bulls and Rams', *Journal of the South African Veterinary Association* 28, 1 (1957), 1–4.
[213] Bonadonna, 'A World Survey of Artificial Breeding I. Development and Organization', 521.

Image 5.10. Bicycle generator FAI device used on a ram

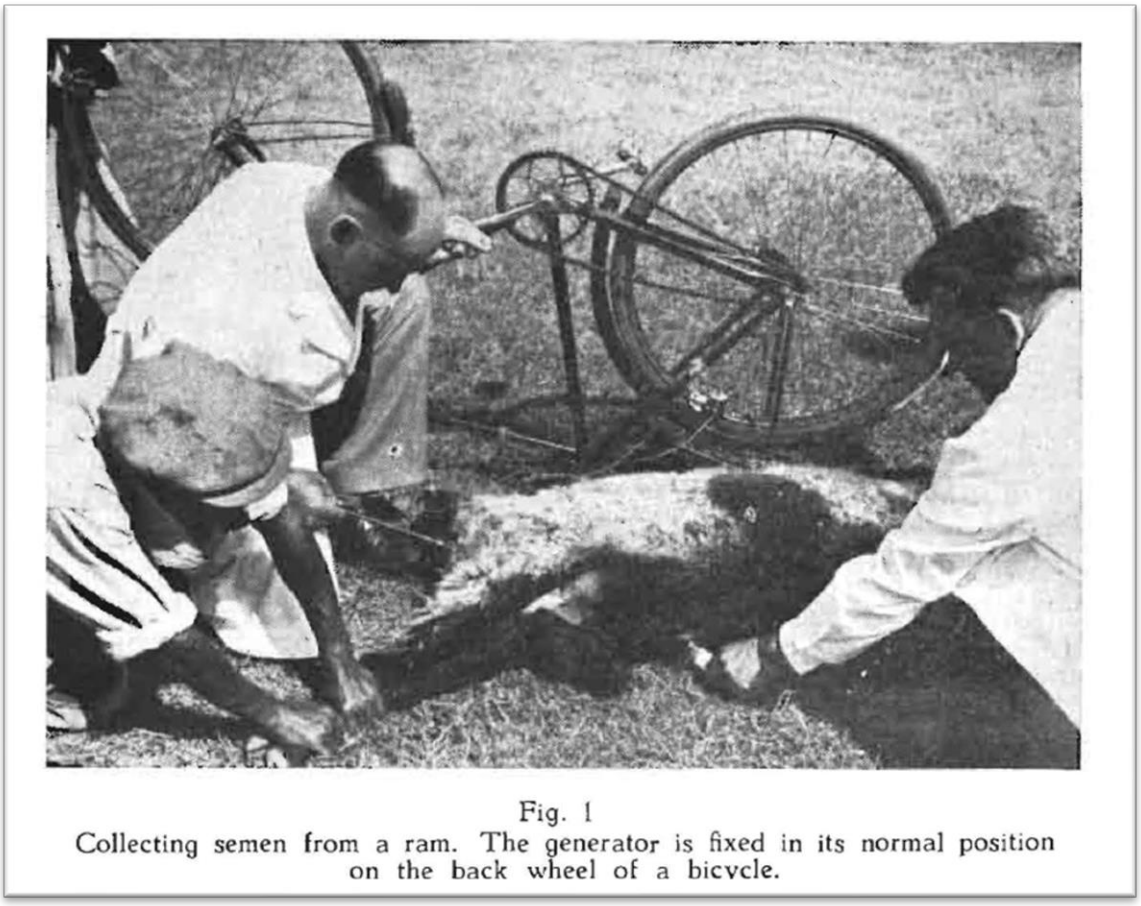

Fig. 1
Collecting semen from a ram. The generator is fixed in its normal position on the back wheel of a bicycle.

Source: W. van Rensburg, 'A Convenient Type of Electro-Ejaculator for Bulls and Rams', *Journal of the South African Veterinary Association* 28, 1 (1957), 1.

In the context of its expanding cattle exports in the 1960s, the Commonwealth Development Corporation and the Bechuanaland government reinvigorated their breeding efforts. A school to train veterinary assistants was opened in 1963.[214] Another 'bull subsidy scheme' was launched in 1964 and some 2 120 bulls were used in this scheme over the next decade.[215] In Botswana artificial insemination appeared just after human independence in 1967.[216] Initially, Botswana's government signed an agreement to import bull semen from the Transvaal Artificial Insemination Cooperative Society in Pretoria.[217] Botswana's vice president himself had sent 90 heifers to be inseminated by December 1967 but only 50 were recommended by

[214] Hillbom, 'Cattle, Diamonds and Institutions', 168; Tlou and Campbell, *History of Botswana*, 274–75.
[215] Mocheregwa, 'Artificial Insemination and the Cattle Industry in Botswana, 1960-2011', 111–12.
[216] *Ibid*, 112.
[217] *Ibid*.

the government's FAI specialist C Jensen, the others being too small.[218] In the same year at least 450 cows were scheduled for the procedure by early adopter farmers.[219] At the end of 1967 there were two functional FAI centres in Botswana. C. Jensen wrote to Irene on 19 December and ordered the semen of 600 Brahman, 200 Africander, 80 Sussex, 60 Simmentaler, and 60 Charolais bulls, and 800 units of liquid nitrogen to preserve the semen.[220] In June 1968 a third centre was opened, namely the Good Hope Artificial Insemination centre, while another two, one in Ghanzi and another in Dibete, were being built.[221]

Image 5.11. Ghanzi forced artificial insemination centre, Botswana 1969

Source: BNA, BNB 1378 (1) ARC 47.2.4, Ministry of Agriculture, *Artificial Insemination in Botswana*, Government Printer: Gaborone, 1969, 2.

[218] *Ibid*.
[219] *Ibid*.
[220] *Ibid*, 113.
[221] *Ibid*, 113–14.

In 1969 the director of veterinary services published and distributed a 12-page information document about how to access FAI in Botswana.[222] It comprised a four-page question and answer section, as well as information about and images of the bulls whose semen was imported from Irene, and some information about progeny tests and about how cows were inseminated in Botswana. It noted that '[o]ur aim with artificial insemination is the improvement of the National Herd by using semen from superior bulls.'[223]

All cattle born via FAI were tattooed on the ear, with information indicating their unique number, year of birth, and the name of their father.[224] They noted that 3 500 cows or heifers had been inseminated so far.[225] The pamphlet warned that [i]njuries can be done to the cow by the inseminator if he is not properly trained', and noted that inseminators in Botswana were trained by a 'Veterinary Surgeon'.[226] It continued, noting that the 'quality of the bull is the best as we only use performance and, preferably, progeny-tested bulls'.[227] Farmers and cattle herders were invited to participate.

> You must bring your females to one of the A. I Centres. Any Stock Inspector will advise you when you bring your cattle to the local crush. After the selection the animals must be brought straight to the A. I centre.[228]

Farmers paid a fee of R2, which included forced insemination, grazing, water, supplementary feeding, and medicine in the event of illness.[229] Cows were detained for between two and four months.[230] The camps ran from September to March. Farmers or herders wishing to forcibly inseminate cows themselves could purchase equipment and semen from the government provided they attended a six-day course first.[231]

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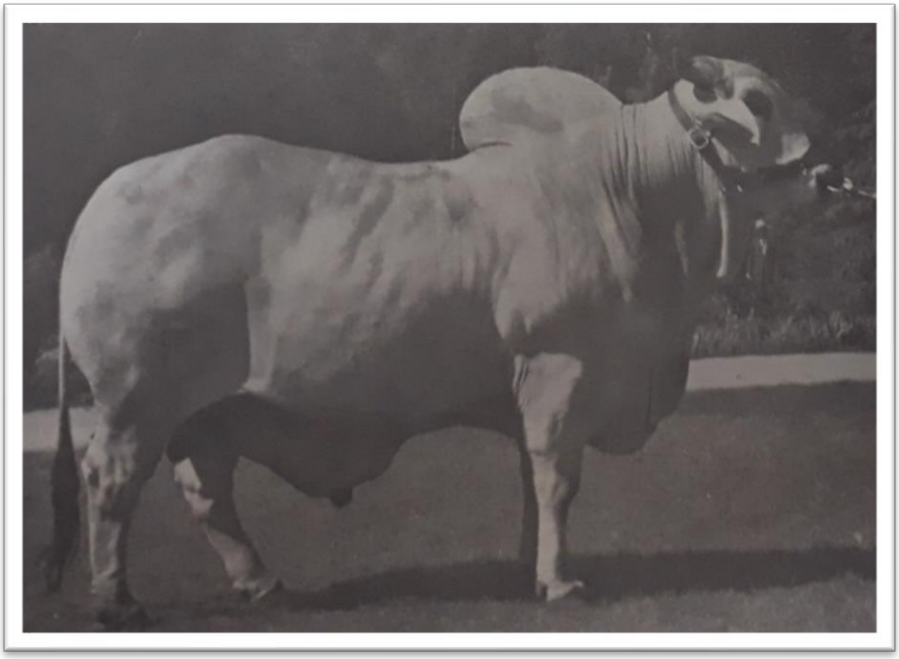
[222] BNA, BNB 1378 (1) ARC 47.2.4, Ministry of Agriculture, *Artificial Insemination in Botswana*, Government Printer: Gaborone, 1969, 1–12.
[223] *Ibid*, 1.
[224] *Ibid*.
[225] *Ibid*, 4.
[226] *Ibid*, 1.
[227] *Ibid*.
[228] *Ibid*, 3.
[229] *Ibid*.
[230] *Ibid*, 4.
[231] *Ibid*, 5–6.

Image 5.12. 'Africander/improved Tswana progeny' born at Good Hope FAI centre

Source: BNA, BNB 1378 (1) ARC 47.2.4, *Artificial Insemination in Botswana*, 7.

The pamphlet then provided images of the bulls whose semen was available at its FAI centres.

Image 5.13. Imperator Mansa at Transvaal FAI centre



Source: BNA, BNB 1378 (1) ARC 47.2.4, *Artificial Insemination in Botswana*, 8.

Image 5.14. Simmenthaler cattle 'Hanf' at Transvaal FAI centre

Source: BNA, BNB 1378 (1) ARC 47.2.4, *Artificial Insemination in Botswana*, 10.

It noted that Simmenthalers were bred for their flesh and milk. Hanf weighed 1202 kilograms when he was photographed. The government noted that only big cows should receive his semen and that all of his male progeny should be castrated.[232]

At this point, Botswana did not forcibly collect bull semen at its FAI centres. This changed in 1970. In 1968 Professor N. Rasbech of the Danish Royal Academy travelled to Botswana, met with the Botswana government and chief veterinary officer, and visited Good Hope, Ghanzi, Maun, Francistown, Tuli Block, Serowe and Dibete.[233] Denmark subsequently funded Botswana's first FAI centre capable of forcibly extracting semen from bulls. This centre was built at Ramatlabama, about 320 kilometres from Irene.[234] Here bulls were subjected to semen extraction. Thereafter, FAI services spread across Botswana with new stations constituted in Makalamabedi, Morupule, Phuduhudu, Nokaneng, and Sefhophe.[235] By 1975

[232] *Ibid,* 10.
[233] Mocheregwa, 'Artificial Insemination and the Cattle Industry in Botswana, 1960-2011', 114.
[234] *Ibid*.
[235] *Ibid*.

there were nine FAI centres in Botswana, with the capacity for impregnating 5 000 cattle.[236] From 1285 cows artificially inseminated in 1967/68, 3039 were thus afflicted in 1972.[237] In these respects, both regional and international scientific networks facilitated the development of FAI in Botswana.

In 1970 Botswana's Animal Production Research Unit (APRU) was established to conduct productionist research on animals.[238] The Botswana government also undertook progeny testing in the 1970s and 1980s. Progeny testing is the other main component of modernised, industrialised animal breeding. Its core aim is to determine the most financially valuable animals for breeding. From 1970 to 1990, 13 different progeny-related tests of cattle were undertaken, 10 relating to flesh production and three relating to dairying.[239] Tests included those evaluating cross-breeding, pure breeding, the effects of Zeranol (an anabolic oestrogen that promotes growth), oestrus synchronisation, and intensive milking systems.[240] Similar studies were undertaken on goats and sheep.[241] One report of bull performance tests in Mantswabese opened by noting that the 'only way in which young bulls can be evaluated for their suitability to enter a breeding herd is on their performance.'[242]

Over two years, fifty bulls were tested for annual and daily weight gains, and then ranked on these metrics.[243] In 1976 the APRU reported on their five-year plan for cattle flesh research. The language used was lucidly productionist, with cattle conceptualised as economic units.

[236] N. Buck, L. Serema, and H. Staugaard, 'Artificial Insemination in Botswana', *British Veterinary Journal* 131, 4 (1975), 386–7.
[237] *Ibid*, 388.
[238] J. Macala, D. Norris, and B. Kiflewahid, 'Cattle Milk and Meat Research and Development in Botswana' (ILCA Workshop on Collaborative Cattle Milk and Meat Research in East and Southern Africa, Harare, 1989), 5.
[239] B. Masilo and O. Madibela, *Report on the State of the World Animal Genetic Resources, Botswana Country Report* (Gaborone: Botswana National Focal Point for the Management of AnGR, 2003), 21.
[240] *Ibid*, 21; BNA, BNB 3143/ ARC 20. 415, Animal Production Research Unit, 'A Five Year Programme of Integrated Beef Cattle and Range Research in Botswana 1970-1975', Gabarone: Ministry of Agriculture, 1976.
[241] Masilo and Madibela, *Report on the State of the World Animal Genetic Resources, Botswana Country Report*, 21–22.
[242] BNA, BNB 1914 (1) ARC 47.2. 12, Animal Production Research Unit, *Increased Production through Breeding. A Report on: Tswana Bull Performance Test Mantswabese Ranch*. Gabarone: Ministry of Agriculture, 1973, 2.
[243] *Ibid*, 3–4.

> The beef breeding cow is maintained for one reason – the production of beef calves for finishing or herd replacement. The female cow is biologically capable of producing one calf per year…it is the objective which should be aimed at.[244]

> At present most heifers do not conceive until they are more than 2.5 years of age. This is too old...Every effort should be made to reduce this age, by finding the faster growing breeds or cross breeds which can be bred younger. Old cows must be culled on assessment of age, tooth wear and bodily condition.[245]

> Maximum growth rates are desirable to ensure that male calves reach slaughter weight at an early age, and that female calves may join the breeding herd as soon as possible.[246]

By the 1980s FAI had become established in South Africa and Botswana. So too had norms of progeny testing, where the value of cows and bulls and calves was determined by scores which related ultimately to their commercial value, as flesh, or calving mothers, or milk producers. FAI in Botswana never became as widespread as in the UK, Scandinavia, Germany, or the US. But FAI was for cattle an explicit impact of colonialism in South Africa, Botswana and Swaziland. For those whom it reached, it comprised an industrialisation of cattle reproduction. Since they were designed to kill cattle at a rate of one per minute, we can say that slaughterhouses in Cape Town and Johannesburg were industrialised by the early twentieth century.[247] Slaughter was industrialised by the mid-twentieth century in Botswana.

Conclusion

This chapter focused on the development of breeding regimes in South Africa, Swaziland and Botswana. In South Africa, the department of agriculture supported pedigree cattle breeding via its agricultural colleges in the early twentieth century. In Bechuanaland and Swaziland, the Colonial Development Fund implemented breeding regimes from the 1920s and 1930s,

[244] BNA, BNB 3143/ ARC 20. 415, Animal Production Research Unit, 'A Five Year Programme of Integrated Beef Cattle and Range Research in Botswana 1970-1975', 19.
[245] *Ibid*, 20.
[246] *Ibid*, 23.
[247] See Chapter Four.

mirroring in part the way the state had established state-supported cattle breeding in England and Wales. In Botswana forced artificial insemination infrastructure was mapped onto its existing colonial breeding centre systems. Globally speaking, the chapter argued that forced artificial insemination was for cattle likely the largest transformation since their domestication during the agricultural revolution. Forced artificial insemination meant that cattle reproduction became industrialised. The emergence of FAI in Botswana and South Africa was investigated in the context of the global proliferation of FAI. In South Africa and Botswana, the coverage of FAI was far less extensive than in Europe, the UK and the United States. In South Africa from the 1940s, and in Botswana especially from the 1970s, cattle became subject to progeny testing, which calibrated cattle in exclusively productionist terms. This chapter investigated progeny testing via a case study of Bonsmara cattle in South Africa, and the Animal Production Research Unit in Botswana from 1975. The chapter explored how processes such as progeny testing and forced artificial insemination subjectively impacted cattle.

Conclusion

This thesis explored core impacts of colonialism in southern Africa, from the perspective of cattle. Its overarching question was: What were some of the major impacts of colonialism on the experiences of cattle? The aim was to present cattle as sentient subjects, and to centre cattle in the historical analysis. The thesis opted out of the orthodox human-centred approach of historical scholarship. Instead, it shifted to an animal-centred paradigm. It explored how colonialism impacted cattle at the individual- and group-levels. The thesis is the first to focus exclusively on how colonialism in southern Africa affected cattle. The thesis was divided into five main parts.

The Introduction located the study within the animal history literature, and animal histories that depict animals as subjects. Outside of some exceptions, it noted that previous animal histories have neither pursued animals' historical experiences in sustained ways, nor explored them in relation to colonialism in southern Africa. That is the space in which this thesis innovated: it investigated colonial impacts on cattle as experiential subjects. To do this, the Introduction developed a notion of species-characteristic animal agency that sees agency as sentient striving towards a species-specific good. This notion of agency informed subsequent chapters' investigations. The methodology section discussed the thesis' regional, multidisciplinary, animal-centred approach, and also its use of archival materials, which were read in light of an interdisciplinary understanding of cattle's experiential capacities. The Introduction distinguished this thesis as an innovative attempt to centre cattle and explore their experiences of colonialism in the region. The Introduction then outlined the chapters' core questions and summarised their investigations. Each chapter, except Chapter One, was devoted to exploring a specific major impact of colonialism on cattle. These impacts were colonial wagon labour (Chapter Two), disease epidemics and veterinary regimes (Chapter Three), the development of slaughterhouses (Chapter Four), and breeding regimes (Chapter Five). These historical and empirical chapters were arranged chronologically and thematically.

Since there is no precedent of a sustained history of southern African colonialism from a cattle perspective, Chapter One of the thesis opened unconventionally. It positioned cattle as

experiential beings, with minds, neurochemicals, emotions, sensory faculties, modes of communication, and rich social relationships. This was done via an interdisciplinary reading of literature on cattle's experiential capacities. This depiction of cattle as sentient subjects formed the basis on which subsequent chapters' empirical, historical investigations interpreted historical sources, so as to understand how historical processes and shifts affected cattle as subjects. The second part of Chapter One historically located cattle in southern Africa before Dutch colonialism began. It covered the period from 8 000 BCE to the 1650s. It drew on evolutionary anthropology, geomorphology, zooarchaeology, and genetic histories. It sketched a broad history of cattle from domestication and their movement from north Africa to southern Africa. Drawing on Raevin Jimenez's comparative historical linguistics research, it showed that from the eleventh century CE cattle in southern Africa became increasingly connected to the social and economic worlds of Proto-Nguni speakers and their descendants. Chapter One's contribution, therefore, was to use an interdisciplinary approach to present cattle as sentient subjects, and to historically locate cattle in southern Africa before the beginning of colonialism. The chapter provided a foundation for the subsequent chapters to investigate cattle's experiences of colonialism.

Chapter Two focused on oxen's experiences of wagon labour. It addressed two questions. How did wagon labour affect the experiences of cattle in Southern Africa? And, what if any contribution to the development of southern Africa did oxen's wagon labour comprise? It covers the period from the VOC first compelling oxen to pull wagons in 1653 until transport wagons were largely replaced by trains in the late nineteenth century. The core contribution and primary innovation of this chapter was that it read over twenty accounts of travellers, missionaries and officials, to analyse specifically how wagon labour affected the oxen themselves. The travellers' writings include hundreds of often vivid descriptions of oxen's wagon labours. The cattle-centred approach enabled a novel reading of the travellers' texts and revealed the ways in which oxen experienced wagon labour. As colonial labours, oxen constituted the primary mode of colonial transport in southern Africa for over two centuries. The chapter recognised cattle as core forced labourers in the development of the region, playing significant roles in the development of the region's motor car roads, and providing crucial transport at the beginning of the Transvaal and Kimberley mining booms. Oxen suffered harsh physical and psychological abuses as colonial transport labourers, which the

chapter demonstrated by reading contemporary accounts in light of an interdisciplinary understanding of cattle as experiential agents. The chapter argued that their labour was a precondition for colonial settlement, trade, and regional transport. The chapter provided the first lengthy history of cattle as experiential, colonial labourers.

Chapter Three investigated three regional cattle epidemics during the nineteenth and early twentieth centuries (1853–1920s). These were Lungsickness, rinderpest, and East Coast fever. Neither of these major epidemics has been studied from a cattle perspective. Gary Marquart's research into rinderpest in Bechuanaland innovated by studying rinderpest's epidemiology, in an attempt to see like rinderpest. My approach was to analyse the epidemics by placing cattle at the centre of the analysis; to see the epidemics like cattle. Its core questions were: How were individual cattle impacted by Lungsickness, rinderpest and East Coast fever, and how were cattle as groups affected? The chapter reinterpreted the disease epidemics by shifting to a cattle-centred reading of them. This chapter argued that the epidemics shifted the course of cattle history in the region. While oxen performed colonial wagon labour, they also spread Lungsickness and rinderpest. Focusing on individual-level impacts, the chapter described the disease courses and symptoms animals endured. It also discussed the interesting absence of scholarship on the colonial cattle massacre policies that were deployed across the region after the epidemics, especially in contrast to the numerous accounts of the Xhosa Cattle Killing in response to Lungsickness. It showed that, regionally, in the first four months of rinderpest, cattle faced both massacre policies and the disease. For cattle, the group-level impacts of the epidemics were stark. Outside of the diseases' death tolls, cattle's transhumant relations with Africans were eroded, and vast fences carved up the landscape and demarcated colonial territory. Although the process began in the mid-nineteenth century in the Cape and colonial Namibia, especially after rinderpest, cattle became biomedical subjects under inchoate nineteenth century colonial states. Cattle were subject to live experiments, and in response to rinderpest and Lungsickness, various crude vaccines were trialled on them. Veterinary officials appeared across the region after rinderpest struck in 1896. Cattle became controlled and monitored by veterinary regimes which were backed by state force. A core part of colonial state-building involved controlling cattle. 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. Building on the previous chapter, the

focus on epidemics and veterinary regimes showed that cattle shifted to becoming biomedical subjects whose productive health was monitored by colonial agricultural and veterinary departments. Exerting wide-ranging and pervasive control over cattle was an integral part of colonisation processes in the region. The chapter's novel contribution is that it provided a regional view of the impact of three epidemics from a cattle perspective.

Chapter Four focused on one of the legacies of the VOC's colonisation of the Cape, namely the development of mass animal slaughter. It asked, how did industrial slaughter enterprises develop and affect the lives and experiences of cattle in the Cape? For domesticated animals like cattle, slaughterhouses are a major and unacknowledged impact of colonialism in southern Africa. This chapter traced the emergence of VOC slaughterhouses at the Cape harbour until slaughterhouses became formalised, regulated, and industrialised in South Africa in the early twentieth century. It drew on new archival material to indicate that various arms of state in the Cape worked together to construct and administer a centralised, public slaughterhouse in Maitland. It also creatively combined sources, such as architectural designs of slaughterhouses and SPCA investigations, to explore cattle's likely experiences of slaughterhouses in the Cape and South Africa. The chapter's core contribution is that it is the first history to investigate slaughterhouses as an impact of colonialism and explore how industrialised slaughterhouses were developed and affected cattle's experiences. It showed that social and political shifts impacted the ways in which cattle were slaughtered, and that government departments – including veterinary, health, and agricultural departments – worked in concert with engineers, the town clerk, and municipalities to construct and administer state-run centralised slaughterhouses from the early twentieth century. The chapter drew on diverse, previously unexplored archival material to investigate this core impact of colonialism in the region and its affective and physical consequences for cattle.

Having discussed cattle's role as colonial wagon labourers, the impact of disease epidemics and veterinary regimes, and the development of slaughterhouses, the final chapter, Chapter Five, explored one further major impact of colonialism, namely the development of colonial breeding regimes, specifically in Botswana and South Africa. The chapter focused on two questions. How did colonial breeding regimes impact cattle as a group in Botswana and South Africa? And, how did breeding processes affect the lives and experiences of cattle? Attempts

at colonial breeding regimes in colonial Swaziland are also explored. The chapter showed that pedigree cattle breeding in South Africa had emerged by the early twentieth century at agricultural colleges and schools and via pedigree breeding societies. It described how colonial authorities in Bechuanaland and Swaziland attempted to implement cattle breeding regimes based on British Livestock Improvement Centres. The chapter also investigated the emergence of progeny testing and modern breeding practices via a case study of Bonsmara cattle breeding in South Africa. A key contribution of the chapter is that it contextualised breeding regimes in southern Africa, both as explicit impacts of colonialism and against the backdrop of major global developments in animal eugenics. The chapter argued that for domesticated animals forced artificial insemination from the mid-twentieth century comprised the industrialisation of animal reproduction and in this way likely constituted the most significant shift in the history of domesticated animals. While human eugenics lost much of its appeal after WWII, animal eugenics proliferated and became a core feature of modern animal agriculture across the globe. While slaughter was industrialised in South Africa and parts of southern Africa in the early twentieth century, reproduction was industrialised in South Africa from the mid-twentieth century and after political independence in Botswana. Significantly, in that forced artificial insemination emerged just after political independence in Botswana, the chapter indicated one way in which cattle history and human history chronologies became clearly distinct: human independence in Botswana saw a deepening of colonial breeding practices for cattle.

This thesis shifted away from a human-centred paradigm by centring cattle and presenting cattle as experiential subjects with minds, sensory faculties, and emotions. It offered a regional and chronological investigation of core impacts of colonialism, as viewed from an animal-centred paradigm. It argued that British and Dutch colonialism had discrete impacts on cattle, and that over the colonial period cattle were dramatically and experientially affected by colonial processes. In its most significant contribution, and by drawing on diverse evidence, the thesis demonstrated that it is possible to write cattle-centred histories that explore cattle's historical experiences.

Not all impacts of colonialism on cattle were explored. Owing to space constraints, this thesis did not explore the development of dairy industries, nor did it explore the colonial

experiences of cattle in rural settings, such as in the Transkei or Lesotho, for example. Future research can explore these and other impacts, such as the role of cattle raiding in colonial conquest. The methodological approach of centring animals and interpreting historical sources on the basis of an interdisciplinary understanding of animals' experiential capacities opens new vistas for future research. A multi-species conception of colonialism enables historical investigations of other animals, such as goats, donkeys, and sheep, or free-roaming animals. This thesis focused almost exclusively on the colonial period; future research could examine how animals fared in post-colonial contexts. This thesis's epilogue shows how animal histories are connected to pressing contemporary crises.

Epilogue

Today, cattle are at the centre of numerous, global, existential threats to sentient life. Our present global context is marked by loud warnings and signs of environmental shifts which have the potential to reconfigure the bedrock environmental conditions of life.[1] Such warnings – like the Intergovernmental Panel for Climate Change's report, *Global Warming of 1.5%* (2018), which noted conservatively that humans have until 2030 to avoid irreversible climate catastrophe – usefully draw our attention to the natural world.[2] The natural world, of which humans and animals form an ineluctable part, and on which our existence depends, is undergoing tremendous and unprecedented shifts. Our geological era is known as the Anthropocene, distinguished in that for the first time a mass extinction event – the present, sixth mass extinction event – is driven by a single species, *Homo sapiens*.[3] As human societies have developed since the agricultural revolution, and the climate has warmed, especially so since the industrial revolution, and most specifically in the last four decades, so have humans dramatically impacted the lives of animals. The World Wildlife Fund (WWF) reports that from 1970 to 2016, population sizes of mammals, fish, amphibians, birds, and reptiles have fallen by a startling 68%.[4] In the last 25 to 30 years, in some areas, 80% of the biomass of insects has disappeared according to the largest review to date on insect populations.[5] In the coming decades, 40% of insect species risk extinction.[6] According to the largest report on species extinctions, produced by the Intergovernmental Science-Policy Platform on Biodiversity and

[1] IPPC, *Summary for Policymakers: Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-Industrial Levels* (Geneva: World Meteorological Organization, 2018), https://www.ipcc.ch/sr15/, accessed 29 January 2019; D. Wallace-Wells, *The Uninhabitable Earth: A Story of the Future* (London: Penguin Books, 2019).
[2] IPPC, *Summary for Policymakers: Global Warming of 1.5°C*.
[3] S. Lewis and M. Maslin, 'Defining the Anthropocene', *Nature* 519, 7542 (2015), 172, 174.
[4] WWF, *Living Planet Report 2020 – Bending the Curve of Biodiversity Loss* (Gland: WWF, 2020), 6.
[5] D. Carrington, 'Plummeting Insect Numbers "Threaten Collapse of Nature"', *The Guardian*, 10 February 2019, http://www.theguardian.com/environment/2019/feb/10/plummeting-insect-numbers-threaten-collapse-of-nature, accessed 11 February 2019. See also footnote below.
[6] F. Sánchez-Bayo and K. Wyckhuys, 'Worldwide Decline of the Entomofauna: A Review of Its Drivers', *Biological Conservation* 232 (2019), 8.

Ecosystem Services (2019), 25%, or a total of one million plant and animals species face likely extinction in the coming decades.[7]

Conscious life is unavoidably premised on biodiversity. The blistering speed of species extinctions is the swiftest it has been in human history. According to WWF, agriculture is the major diver of biodiversity loss and transgressions of the planetary boundaries, in terms of nitrogen, phosphorous, freshwater use, and climate change.[8] Within the category of agriculture, animal agriculture is by far the most environmentally treacherous. Animal agriculture is a primary site of anthropogenic climate change, species extinctions, and biodiversity loss. In particular, cattle are tightly connected to these challenges.

In August of 2019 dramatic images of the Amazon rainforest burning captured public imaginations. Brazil's National Institute for Space Research reported that 74 000 fires raged between January and August.[9] NASA claimed that, overall, the fire activity in the Amazon for 2018 was just below average, relative to previous years.[10] Then German Chancellor Angela Merkel described the fires as an 'acute emergency' and claimed that they were 'threatening…the whole world'.[11] The European Parliament released a special briefing called *Amazon Wildfire Crisis: Need for an International Response,* and noted that many of the fires were started intentionally.[12] Some estimate that 80% of Amazon deforestation is for cattle ranching purposes, and cattle ranching is widely recognised as the predominant driver of deforestation in the Amazon.[13]

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[7] S. Diaz., *et al*., *Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (Bonn: IPBES, 2019), 11–12.
[8] WWF, *Living Planet Report 2020 – Bending the Curve of Biodiversity Loss*, 20, 37, 46, 60.
[9] BBC, 'Amazon Fires Increase by 84% in One Year – Space Agency', *BBC News*, 21 August 2019, www.bbc.com/news/world-latin-america-49415973, accessed 23 August 2019.
[10] *Ibid.*
[11] BBC, 'Amazon Fires: Merkel and Macron Urge G7 to Debate "Emergency"', *BBC News*, 23 August 2019, https://www.bbc.com/news/world-latin-america-49443389, accessed 23 August 2019.
[12] E. Gómez Ramírez, 'Amazon Wildfire Crisis Need for an International Response', *European Parliamentary Research Service*, 2019, 1, https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/644198/EPRS_BRI(2019)644198_EN.pdf, accessed 3 December 2019.
[13] D. Nepstad, 'The End of Deforestation in the Brazilian Amazon', *Science* 326, 5958 (2009), 1350; F. Müller-Hansen *et al*., 'Can Intensification of Cattle Ranching Reduce Deforestation in the Amazon? Insights From an Agent-Based Social-Ecological Model', *Ecological Economics*, 159 (2019), 198.

Then Brazilian president Jair Bolsonaro, a diehard cattle ranching supporter, approached the issue with a cavalier mentality, claiming that it was the 'season of the queimada [burned]'.[14] The BBC quoted him as saying at the time: 'I used to be called Captain Chainsaw. Now I am Nero, setting the Amazon aflame'.[15] Comprising the world's second-largest national herd, 232 million cattle lived in Brazil in 2018, and Brazil in that year produced 9.9 million metric tons of cattle flesh, its highest ever, making Brazil the world's largest cattle flesh exporter.[16] Brazil is home to JBS, the largest animal flesh packing corporation on the planet.[17] Its annual CO2 equivalent emissions are at least 280 million metric tons, which is greater than the combined emissions of the next three largest animal flesh corporations.[18] It sells animal flesh and/or skins (leather) to 350 000 buyers in 150 countries.[19] JBS's 2019 annual report noted that it purchased cattle from 90 000 'livestock suppliers' in Brazil.[20] In a foresightful summation, when philosopher Peter Singer looked at the connection between cattle ranching and deforestation in the mid-1970s, he remarked that: 'We are, quite literally, gambling with the future of our planet – for the sake of hamburgers.'[21]

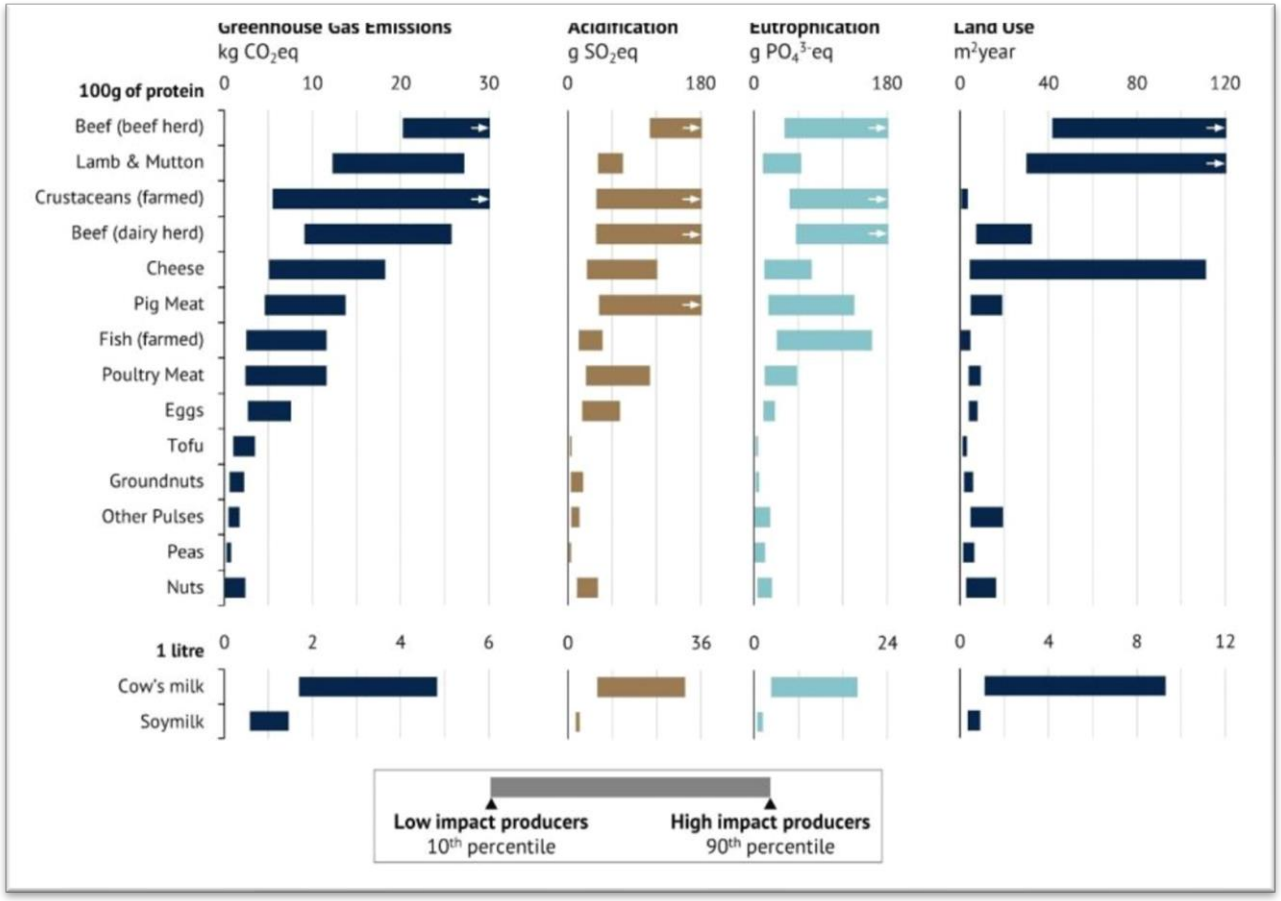
Beyond deforestation, animal agriculture, and cattle, in particular, are connected to environmental crises. In 2018 the largest-ever study on the environmental impacts of food production was published.[22] In a subsequent interview, lead author Joseph Poore stated that '[a]griculture is a sector that spans all the multitude of environmental problems' and that '[r]eally it is animal products that are responsible for so much of this'.[23] The study examined

[14] BBC, 'Amazon Fires Increase by 84% in One Year – Space Agency.'
[15] *Ibid.*
[16] M. Zia *et al*., 'Brazil Once Again Becomes the World's Largest Beef Exporter (blog)', *Economic Research Service U.S Department of Agriculture*, 1 July 2020, https://www.ers.usda.gov/amber-waves/2019/july/brazil-once-again-becomes-the-world-s-largest-beef-exporter/, accessed 12 July 2020.
[17] O. Lazarus, S. McDermid, and J. Jacquet, 'The Climate Responsibilities of Industrial Meat and Dairy Producers', *Climatic Change* 165, 30 (2021), 6.
[18] *Ibid*.
[19] D. Phillips *et al*., 'Revealed: Rampant Deforestation of Amazon Driven by Global Greed for Meat', *The Guardian*, 2 July 2019, https://www.theguardian.com/environment/2019/jul/02/revealed-amazon-deforestation-driven-global-greed-meat-brazil, accessed 2 July 2019.
[20] JBS., *JBS Annual and Sustainability Report* (JBS 2019), 182, https://www.jbs.com.br/relatorioanual2019/en/home/, accessed 3 June 2021.
[21] P. Singer, *Animal Liberation: A New Ethics for Our Treatment of Animals* (New York: Harper Collins, 2002 [1975]), 169.
[22] J. Poore and T. Nemecek, 'Reducing Food's Environmental Impacts through Producers and Consumers', *Science* 360, 6392 (2018), 987–92.
[23] D. Carrington, 'Avoiding Meat and Dairy is "Single Biggest Way" to Reduce Your Impact on Earth', *The Guardian*, 31 May 2018, https://www.theguardian.com/environment/2018/may/31/avoiding-meat-and-dairy-is-single-biggest-way-to-reduce-your-impact-on-earth, accessed 4 June 2018.

38 700 farms, 1 600 processors, and represented 90% of the food types humans typically eat.[24] Notably, in terms of food production, it found that 'livestock' comprised 18% of the calories and 37% of proteins that humans eat, but used 83% of farmland, and yielded 57% of water pollution, and 56-58% of greenhouse gas emissions.[25] In terms of greenhouse gas emissions, cattle flesh was found to be the most environmentally harmful commodity.[26] Cattle can each release between 250 and 500 litres of methane *per day*.[27] Methane is a powerful greenhouse gas, with a global warming potential rating 25 times stronger than carbon dioxide over 100 years, although methane only stays in the atmosphere for 9-12 years.[28] Thus cattle industries are a primary site of the climate and environmental breakdown. 'Most strikingly', the authors reported, 'impacts of the lowest-impact animal products typically exceed those of vegetable substitutes.'[29] That is, according to the largest study ever conducted – in terms of greenhouse gas emissions, land use, water and air pollution, eutrophication, and freshwater withdrawals – the least environmentally harmful animal products are typically worse for the environment than the most harmful plant alternatives.

[24] Poore and Nemecek, 'Reducing Food's Environmental Impacts through Producers and Consumers', 987.
[25] *Ibid*, 990.
[26] *Ibid*, 988.
[27] K. Johnson and D. Johnson, 'Methane Emissions from Cattle', *Journal of Animal Science* 73, 8 (1995), 2483.
[28] Å. Wahlquist, 'Eating Beef: Cattle, Methane and Food Production', *Asia Pacific Journal of Clinical Nutrition* 22, 1 (2013), 16.
[29] Poore and Nemecek, 'Reducing Food's Environmental Impacts through Producers and Consumers', 987.

Image E.1. Greenhouse gas emission, acidification, eutrophication, and land use by food type



Source: D. Carrington, 'Avoiding Meat and Dairy is "Single Biggest Way" to Reduce Your Impact on Earth', *The Guardian*, 31 May 2018, https://www.theguardian.com/environment/2018/may/31/avoiding-meat-and-dairy-is-single-biggest-way-to-reduce-your-impact-on-earth, accessed 31 May 2018; J. Poore and T. Nemecek, 'Reducing Food's Environmental Impacts through Producers and Consumers', *Science* 360, 6392 (2018), 987–92.

Animal agricultural industries are a primary threat to planetary sustainability and a liveable future. In terms of the 2015 Paris Climate Agreement and countries' nationally determined contributions, a recent study found that if they persist with their current trajectories, two animal agriculture companies, Fonterra in New Zealand and Nestlé in Switzerland, would each

alone emit more than their host country's total permitted emissions in the coming decade.[30] Denmark's Arla is alone projected to emit 60% of Denmark's total agreed emissions.[31]

In Africa, animal flesh industries are nowhere near as large as those in Europe, South America, the United States, and China.[32] But Africa is following these nations' paths towards vast industrialised animal agriculture systems. Animal flesh industries are growing, and animal flesh consumption rates are rising steadily, if relatively less rapidly.[33] In Africa, one-third of the combined GDP of the continent's 54 countries comprises agricultural production.[34] For sub-Saharan Africa, agriculture is predicted to be a one trillion US$ industry by 2050.[35]

Beyond being a primary site of the anthropogenic climate breakdown, animal industries and animal agriculture present destabilising zoonotic threats. The United States' Centre for Disease Control notes that 75% of new or emerging infectious diseases in humans come from animals.[36] Some believe that all human infectious diseases are zoonotic, while the animal origins of the majority of major human diseases are certain or probable.[37] Zoonotic threats are powered by intensive animal agriculture, destruction of wildlife habitats, trade in local and exotic animals, and wet markets.[38]

Intensive animal farming, involving large numbers of animals in crowded and unhealthy conditions, animal trading, as well as wet markets comprising excreta, urine, blood and the slaughter of diverse animals, who would never otherwise be in transmission-enabling contact, have fostered conditions for zoonoses to jump from animals to humans. For their flesh, over

[30] Lazarus, McDermid, and Jacquet, 'The Climate Responsibilities of Industrial Meat and Dairy Producers', 1.
[31] *Ibid*, 13.
[32] H. Ferdowsian, 'Africa's Meat and Dairy Industry: A Threat to the Continent's Future?', in R. Ebert and A. Roba (eds.), *Africa and Her Animals: Philosophical and Practical Perspectives* (Pretoria: UNISA Press, 2018), 295.
[33] *Ibid.*
[34] A. Roba, 'The Looming Threat of Factory Farming in Africa', in R. Ebert and A. Roba (eds.), *Africa and Her Animals: Philosophical and Practical Perspectives* (Pretoria: UNISA Press, 2018), 226.
[35] *Ibid.*
[36] Centre for Disease Control and Prevention, 'Zoonotic Diseases (blog)', *CDC*, 14 July 2017, https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html, accessed 3 March 2020.
[37] J. Weber and K. Alcorn, 'Origins of HIV and the AIDS Epidemic', *MedGenMed* 2, 4 (2000), 6; N. Wolfe, C. Dunavan, and J. Diamond, 'Origins of Major Human Infectious Diseases', *Nature* 447, 7142 (2007), 282.
[38] WHO/FAO/OIE and Health Council of the Netherlands, *Report of the WHO/FAO/OIE Joint Consultation on Emerging Zoonotic Diseases* (Geneva: WHO/FAO/OIE, 2004), 7. 59.

70 billion farmed animals are killed each year, the majority of whom are chickens.[39] The number of fish killed each year by humans is uncountable, meaning that estimates are derived by the weight of catches via estimating the individual number of fish by running different inferential statistical models for which types of fish typically live in a specified area and their typical weights. 2013 estimates for the annual number of fish killed in the wild by humans range from 970 billion to 2.7 trillion.[40] To make these numbers less abstract, notice that the total number of humans who have ever existed is estimated to be 108 billion.[41] The scale of humans' impacts on animals is thus difficult to contemplate.

The conditions which may have given rise to COVID-19, namely wet markets, are still in place.[42] While there are scores of wet markets in New York, for example, the Law Library of Congress in 2020 produced a report examining the legality of wet and/or wildlife markets in 28 countries, excluding the United States, which gave a sense of how globally widespread such markets are.[43] They noted that there are wild animal or wet markets in Russia, Mexico, Myanmar, Thailand, Vietnam, Georgia, Argentina, South Africa, Botswana and many other countries.

In addition to zoonotic threats, antibiotic resistance is closely connected to contemporary animal industries. So that they do not become ill in intensive animal farming settings, and to propel extremely rapid body growth, farmed animals are fed vast quantities of antibiotics. Antibiotic use for these purposes has been common since the 1950s.[44] Antibiotic use is a core

[39] Our World in Data, 'Number of Animals Slaughtered for Meat, World, 1961 to 2018', *Our World in Data*, 26 March 2021: https://ourworldindata.org/grapher/animals-slaughtered-for-meat?country=~OWID_WRL, accessed 26 April 2021.
[40] P. Brooke and A. Mood, 'The Welfare of Fish in Commercial Fishing', *fishcount.org*, 2013, http://www.fishcount.org.uk/published/high/fishcount-presentation1-2013HR.pdf, accessed 26 April 2021.
[41] T. Kaneda and C. Haub, 'How Many People Have Ever Lived on Earth?', *Population Research Bureau*, 23 January 2020, https://www.prb.org/howmanypeoplehaveeverlivedonearth/, accessed 26 April 2021.
[42] A. Maxmen, 'WHO Report into COVID Pandemic Origins Zeroes in on Animal Markets, Not Labs', *Nature* 592 (2021), 173. For a recent alternative view, see K. Eban, 'The Lab-Leak Theory: Inside the Fight to Uncover COVID-19's Origins', *Vanity Fair*, 3 June 2021, https://www.vanityfair.com/news/2021/06/the-lab-leak-theory-inside-the-fight-to-uncover-covid-19s-origins, accessed 8 June 2021.
[43] CBS News, 'Live Animal 'Wet Markets' in New York City Face Protests amid Coronavirus Pandemic', *CBS This Morning*, May 9, 2020, https://www.cbsnews.com/news/coronavirus-pandemic-animal-wet-market-new-york-city-protests/, accessed 10 May 2020; Law Library of Congress, 'Regulation of Wild Animal Wet Markets in Selected Jurisdictions', *Library of Congress*, 2020, https://www.loc.gov/law/help/wet-markets/index.php, accessed 3 November 2020.
[44] R. Gustafson, 'Use of Antibiotics in Livestock and Human Health Concerns', *Journal of Dairy Science* 74, 4 (1991), 1428.

feature of modern animal agriculture systems. In South Africa, for example, between 2002 and 2004, 1 538 443 kilograms of antibiotics were fed to farmed animals.[45] In the United States, in 2019, the Food and Drug Administration approved 11 468 357 kilograms of antibiotics to be fed to farmed animals.[46] One drawback of antibiotic misuse is the emergence of antibiotic-resistant bacteria or antimicrobial resistance. In April 2021 the World Health Organisation reported staidly that none of the 43 antibiotics currently in clinical development can 'sufficiently address' extant antimicrobial bacteria.[47]

In 2019 the United Kingdom's then chief medical officer, Professor Sally Davis, warned that antibiotic resistance 'could kill us before climate change does.'[48] Sally Davis co-convened the Interagency Coordination Group on Antimicrobial Resistance, which in 2019 submitted a report to the secretary-general of the United Nations, which warned that drug resistant diseases from overuse and misuse of antibiotics could cause 10 million deaths annually by 2050.[49] Those particularly attuned to the situation have tried to issue warnings. As bioethics philosopher David Benatar put it:

> It is entirely possible that the human future will involve a return to the pre-antibiotics era, in which people died in droves from infections that have been effectively treated since the discovery of penicillin…If so, it may turn out that the antibiotics era was a brief interlude between two much longer periods in human history in which we succumbed in large numbers to bacterial infections.[50]

[45] J. Moyane, A. Jideani, and O. Aiyegoro, 'Antibiotics Usage in Food-Producing Animals in South Africa and Impact on Human: Antibiotic Resistance', *African Journal of Microbiology Research* 7, 24 (2013), 2992.
[46] U.S FDA, *2019 Summary Report on Antimicrobials Sold or Distributed for Use in Food-Producing Animals* (U.S Food and Drug Administration, 2020), 12, https://www.fda.gov/media/144427/download, accessed 7 January 2021.
[47] WHO, 'Global Shortage of Innovative Antibiotics Fuels Emergence and Spread of Drug-Resistance', *World Health Organisation*, 15 April 2021, https://www.who.int/news/item/15-04-2021-global-shortage-of-innovative-antibiotics-fuels-emergence-and-spread-of-drug-resistance, accessed 15 April 2021.
[48] L. Thornton, 'Antibiotic Resistance Could Wipe out Human Race before Climate Change', *Mirror*, 29 August 2019, https://www.mirror.co.uk/news/uk-news/antibiotics-resistance-could-wipe-out-19034176, accessed 2 September 2019.
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[50] D. Benatar, 'Our Cruel Treatment of Animals Led to the Coronavirus', *The New York Times*, 13 April 2020, https://www.nytimes.com/2020/04/13/opinion/animal-cruelty-coronavirus.html, accessed 14 April 2020.

These five consequences of modern agriculture – biodiversity loss and species extinctions, deforestation, environmental impacts, zoonotic threats, and the potential post-antibiotic era – connect this thesis's shift to focusing on domesticated animals, historically. It is hard for a human mind not to pass quickly over these most recent facts about our current ecological and global health position. Our ecological foundations are at existential risk. Basic, fundamental tools of the medical profession, such as penicillin and other antibiotics, may soon be obsolete. The next pandemics are plausibly a question of when not if. A million species risk extinction in the coming decades. In this context, a shift in focus towards the natural world, to the animals with whom we share this interspecies planet is timely and defensible.

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Curriculum vitae

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