The scientist has returned to our news bulletins. Nature itself is said to have ‘returned’. Wildlife has entered cities. Waters have run clean and atmospheric nitrogen dioxide levels have dropped. Even from space the Earth looked different. But should the historian return in new guise too? In the past weeks, if historians have been heard, they have been asked to provide lessons from past epidemics to speak to those in lockdown and provide solace and cultural nourishment.¹ This is a laudable goal, but the danger is that history is then something that has left us; it is of the past rather than the present. The comparative exercise in view becomes possible because of a now-dated commitment to the idea that events follow patterns and that the juxtaposition of historically separated events, even those occurring in dramatically different social and political contexts, can be meaningful. Yet hiding behind the COVID-19 pandemic is another genre of history: one that is long-term and environmental. It is of urgent force today given the larger crisis that frames the pandemic, namely the climate emergency.

To historicize COVID-19, meaning to historicize this virus itself rather than to perceive it to be like another disease that has

¹For comments and assistance I thank: Warwick Anderson, Kasia Boddy, Mary Brazelton, Melissa Calaresu, Chris Clark, Sandagomi Coperahewa, Tamara Fernando, Matthew Higgins, Ed McNally, Steph Mawson and my graduate reading group which discussed this piece by videoconference. The final version of this article was submitted on 5 June 2020.

¹For some examples of this see, for instance, much of the coverage of COVID-19 in the ‘History of Now’ podcast series from the University of Cambridge, at <https://www.hist.cam.ac.uk/podcasts/covid-19-podcasts> (accessed 11 May 2020), and the online blogs on past experience of epidemics in History Workshop Journal’s ‘Historians’ Watch’, at <http://www.historyworkshop.org.uk/category/historians-watch/>. But note the caution in Guillaume Lachenal and Gaëtan Thomas, ‘COVID-19: When History has No Lessons’ from ‘Historians’ Watch’, published 30 March 2020, at <http://www.historyworkshop.org.uk/covid-19-when-history-has-no-lessons/>, and see also the caution in the short comment, Robert Peckham, ‘COVID-19 and the Anti-Lessons of History’, Lancet, 14 Mar. 2020.
afflicted humans in the past, one must begin with the premise that it is not a bolt from the blue nor an unexpected disaster. Nor must one adopt heavily humanized and weaponized language in describing the virus as ‘the mugger’ or the ‘invisible enemy’, as politicians have, or even as scientists have in describing their work as ‘virus hunting’. It is necessary to decentre the anxious human subject, concerned about their health, their work, their family, their neighbourhood and their future. To decentre the human is not to minimize the salient challenges to human subjectivity posed by the current dilemma or indeed to forget the structural inequalities in human society which have already been highlighted by COVID-19. But if historical explanation focuses too heavily on themes such as solitude, lockdown, governance and surveillance, the prehistory of COVID-19 goes missing. And in turn the prospects for the human future in a time of climate change become murkier. This research was undertaken in April and May 2020, in lockdown, with all the limitations that this brought. It relies on digitally-available primary and secondary sources. It is offered with the aim of further foregrounding environmental and ecological perspectives in the historiography that may emerge after the pandemic passes.

The viewpoint of this article is that zoonotic transfer occurs where relations between humans and animals have been unstable or where they are entering a new phase of contact. Such transfer is linked with the climate emergency because life on the planet is being radically changed by accelerating extinctions caused partly by humans entering biodiverse areas and using land in new ways. This is altering the interspecies frontier. In turn, what is needed from historians — instead of a simple ‘compare and contrast’ exercise between COVID-19 and past diseases — is an explanation that tracks the environmental past of the virus and the relation between the planet’s illness and human illness. Such a history might include the intensifying structures of colonization, capitalism and settlement as they alter

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2 See, for example, the language used by Boris Johnson to describe the virus: David Shariatmadarai, “‘Invisible Mugger’: How Boris Johnson’s Language Hints at His Thinking’, Guardian, 27 Apr. 2020; for the scientific imagery of ‘virus hunting’ see The Virus Hunters: Heroes Racing to Extinguish New Pathogens, BBC Radio 4, 29 Apr. 2020, available at <https://www.bbc.co.uk/programmes/articles/1TFzyYwF7t5FzYRvDzW0HDj/the-virus-hunters-heroes-racing-to-extinguish-new-pathogens> (accessed 11 May 2020).
interspecies relations. Historians might confidently engage contemporary science which is enjoying a revival after an age of scepticism. Indeed, today’s science on the zoonotic spill-over still shows the legacies of historical problems connected with classification. Scientists themselves are calling for the plotting of human relations with nature over the long term. Philosophical and theoretical debates about the boundaries of a species, causation at the interspecies frontier and the agency of the animal may be part of what the historian offers towards a deeper understanding of the origins of the pandemic.

What follows centres the pangolin’s encounter with the human as a story through which to explore these wider concerns. The pangolin is certainly not the only creature which could have been studied. Rather, this set of reflections is intended as a first step in understanding the prehistory of COVID-19. My own research on animals in Asian history mirrors wider changes in the writing of animal histories. Earlier work in animal history focused on human representations of animals, and human reliance on animals in war, empire, trade and cultural production. But more recently, anthropocentric cultural history has given way. More attention is paid to how to centre the animal and how to invert the historical interpretation so that animals, a new class of ‘subalterns’, have more space in history. My own work has called for attention to the human–animal complex in history without attributing absolute or singular agency to animals. Accordingly, the perspective that is adopted in what follows is that the combination of humans and animals has been generative of zoonotic spill-over. Agency should be approached as an assemblage across species or placed in what Jason W. Moore has called a ‘web of life’. The pangolin–human relationship looked different in South Asia in a moment of orientalist textual study in the late eighteenth century from the way it looked in a period of domestication and settlement in the late nineteenth and early twentieth centuries. It looks very different again today, when

3 The two pieces which I contrast in this paragraph are Sujit Sivasundaram, ‘Trading Knowledge: The East India Company’s Elephants in India and Britain’, Historical Journal, xlviii (2005) and Sujit Sivasundaram, ‘Imperial Transgressions: The Animal and Human in the Idea of Race’, Comparative Studies of South Asia, Africa and the Middle East, xxxv (2015).

4 See Jason W. Moore, Capitalism in the Web of Life: Ecology and the Accumulation of Capital (London, 2015); see also the work of Donna J. Haraway, for example When Species Meet (Minneapolis, 2008).
pangolins have little room to manoeuvre as they are killed to feed a mostly Chinese market. The changing phases of this relationship are part of the preconditions for SARS-CoV-2.

I have been particularly interested in how the imperial idea of race has arisen through the assembly, classification and entanglement of the material culture of the animal and human. COVID-19 has also generated a racial language and everyday racist acts. The stereotyping of the virus as ‘Chinese’ and its description as the ‘Wuhan virus’ point to an othering of Chinese practices of medicine and cuisine, linked for instance to Wuhan’s ‘wet market’ which was suspected to be at the centre of the outbreak. Some commentators have offensively described the Chinese ‘wet markets’ as ‘medieval’ while others have pointed out that these market stalls are not too different from ‘farmers’ markets’ in the West which sell goods such as crabs or lobsters. There is no local equivalent in Wuhan for the term ‘wet market’, which was probably imported to China from Singapore or Hong Kong. The focus on ‘wet markets’ meanwhile hides the more heavily capitalized agribusiness which now thrives in China, eclipsing the smallholder farmers who sell in markets such as this. While human engagements with wildlife are easily characterized as culturally particular, in fact, as I will argue here, the long prehistory of COVID-19 is not Chinese alone. That long prehistory lies in human engagements with animals such as pangolins in a variety of settings, including Europe as well as Africa and different parts of Asia. This global, increasingly capitalized and geographically-evolving story is one historical context that has allowed SARS-CoV-2 to jump across the species barrier to give rise to COVID-19.

These reflections begin with the most recent science which is interpreted with a historical lens. The focus then moves into indigenous Asian knowledges of the pangolin, so that Western modes of scientific knowing are not privileged. There follows a

5 Sivasundaram, ‘Imperial Transgressions’.
6 For more on this and also for an initial exploration of the role of the market in the spread of coronavirus, see Andrew Liu, “Chinese Virus”, World Market’, n+1, 20 Mar. 2020, available at <https://nplusonemag.com/online-only/online-only/chinese-virus-world-market/> (accessed 11 May 2020).
7 Christos Lynteris and Lyle Fearnley, ‘Why Shutting Down Chinese “Wet Markets” Could Be a Terrible Mistake’, The Conversation, 31 Jan. 2020, updated 2 Mar. 2020, available at <https://theconversation.com/why-shutting-down-chinese-wet-markets-could-be-a-terrible-mistake-130625/> (accessed 1 June 2020).
of how pangolins and humans responded to each other in the context of changing structures of colonization and settlement in South Asia. The conclusion returns to the role of the historian in a pandemic, the relationship between environmental change and SARS-CoV-2 and the instability of human–animal relations as an explanation for the origins of COVID-19.

I

READING SCIENCE HISTORICALLY

Scientists are in the midst of a number of studies which seek to determine how COVID-19 arose. Samples taken from patients with COVID-19 have demonstrated that 96.2 per cent of the genome of this virus is shared with a coronavirus from horseshoe bats. This is in keeping with other recent coronavirus transmissions between animals and humans in which bats have played a role. MERS-CoV was transmitted from bats to camels and on to humans; SARS-CoV from bats to palm civets and then to humans. The so-called ‘Great Russian Flu’ of 1891 may also have involved a coronavirus transmission; this theory arises from a contemporary scientific comparison of a human coronavirus with one found in cows. When mutations between the two viruses from humans and cows were dated, this led to a possible common ancestor around 1890.8 Shen Yongzi and Xiao Lihua of South China Agricultural University in Guangzhou were the first to propose that the pangolin was the intermediate host for the SARS-CoV-2 strain of coronavirus which gives rise to COVID-19.9 But a team of scientists led by Xingguang Li of Hubei Engineering Research Centre in Wuhan, including American scientists and with the use of US data too, rejected the identification of the pangolin as the intermediate host in a paper in the *Journal of Medical Virology*.10

Li and his collaborators found a peptide motif in the spike protein of the COVID-19 virus which they suggested might be

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8 Leen Vijgen *et al.*, ‘Complete Genomic Sequence of Human Coronavirus OC43: Molecular Clock Analysis Suggests a Relatively Recent Zoonotic Coronavirus Transmission Event’, *Journal of Virology*, lxix (2005).

9 Xingguang Li *et al.*, ‘Evolutionary History, Potential Intermediate Animal Host, and Cross-Species Analyses of SARS-CoV-2’, *Journal of Medical Virology*, xcii (2020); on the first identification of the pangolin as the intermediate host at a press conference, see p. 603.

10 *Ibid.*
linked to the transmissibility of the virus. They argued that this was not present in the coronavirus carried by pangolins. Despite this, the last sentence in the paper in the *Journal of Medical Virology* raises a qualification: ‘However due to the limited viral metagenomic data obtained from pangolins, we cannot exclude that other pangolins from China may contain coronaviruses that exhibit greater similarity to the SARS-CoV-2 virus’. This qualification is of interest to historians of animals because the pangolin has consistently generated classificatory confusion among humans. In the words of some recent zoologists, it has ‘a chaotic taxonomic history’.

Naturalists have puzzled over whether to place pangolins next to other ant-eating mammals (such as armadillos, sloths, anteaters and aardvarks) or instead alongside carnivorans. Pangolins now comprise a mammalian order named Pholidota, with three genera, Manis, Phataginus and Smutsia. Eight different species are found in subtropical Asia and sub-Saharan Africa. Long-standing difficulties in fixing the pangolin mirror the end point of the *Journal of Medical Virology* paper. The two pangolin samples used by the authors of this article were described as ‘Malayan’ and ‘Manis Javanica’. But the scientists’ qualification raises the question of whether the result may have been different if they had compared their samples with coronavirus in pangolins ‘from China’.

Even more recently, a further paper has come out in *Nature*, which has returned attention to the pangolin as the most likely intermediate host in the chain of transmission. A new group of scientists, led by Kangpeng Xiao of the College of Veterinary Medicine, South China Agricultural University, Guangzhou, describe how they procured tissue samples from the lungs of

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11 *Ibid.*, 609.
12 Philippe Gaubert *et al.*, ‘Phylogeny and Systematics’, in Daniel W. S. Challender, Helen C. Nash and Carly Waterman (eds.), *Pangolins: Science, Society and Conservation* (London, 2000), 25.
13 *Ibid.*
14 For more information on the conservation of pangolins see the website of the voluntary group of experts devoted to this cause, <https://www.pangolinsg.org/>.
15 Kangpeng Xiao *et al.*, ‘Isolation of SARS-CoV-2-Related Coronavirus from Malayan Pangolins’, early version published in advance view, *Nature*, 7 May 2020, available at <https://www.nature.com/articles/s41586-020-2313-x> (accessed 11 May 2020).
dead pangolins. They pointedly included both ‘Chinese’ and ‘Malay’ pangolins:

Pangolins used in the study were confiscated by Customs and Department of Forestry of Guangdong Province in March and August 2019. They included four Chinese pangolins (*Manis pentadactyla*) and 25 Malayan pangolins (*Manis javanica*). The animals were sent to the wildlife rescue centre, and were mostly inactive and sobbing, and eventually died in custody despite exhausting rescue efforts. Tissue samples were taken from the lungs of pangolins that had just died for histological and virological examinations.  

Their conclusions are different: in this paper, the virus infecting humans is said to originate from a genetic recombination of a pangolin virus with a bat virus. This once again highlights the difficulty of isolating the viruses carried by pangolins given the variety of pangolin species. It also highlights the recombinations and reorganizations across species that may be part of the zoonotic disease chain. Indeed, it is now thought that SARS-CoV-2 can infect a large range of animals (excluding fish, birds and reptiles).  

If the classification of a pangolin is a muddy enterprise in the sense that there is no single species, the virus likewise is not a separable entity which passed or ‘jumped’ across species. It may have radically changed its form in doing so.

Despite the best efforts of scientists to understand the mechanisms through which this virus originated across species, the role of the historian is also critical in understanding the ‘spill-over’ of diseases, for the transference of zoonotic diseases now occurs more rapidly because of the way humans have altered nature over centuries. The mammalian orders that carry the vast majority of zoonotic diseases are rodents, bats and primates. Among the anthropogenic drivers of this transmission are human domestication of animals, human encroachment into habitats high in wildlife biodiversity, and the hunting of wild animals. Additionally, large-scale industrial farming is a problem because it produces genetically similar populations

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16 *Ibid.*, 3.  
17 S. D. Lam *et al.*, ‘SARS-CoV-2 Spike Protein Predicted to Form Stable Complexes with Host Receptor Protein Orthologues from Mammals’, preprint article, version 3, 14 May 2020, available at *BioRxiv*, <https://doi.org/10.1101/2020.05.01.072371> (accessed 2 June 2020).  
18 Christine K. Johnson *et al.*, ‘Global Shifts in Mammalian Population Trends Reveal Key Predictors of Virus Spillover Risk’, *Proceedings of the Royal Society B*, cclxxxvii (2020).
across which disease can spread quickly. The relationship between the animal, the human and disease deserves plotting over the longue durée, an exercise that scientists are ill-equipped to perform. This would provide a fuller prehistory of COVID-19. Tellingly, the scientist-authors of one recent paper specifically write of the need for a ‘historical account of how humans have altered the nature of their contact with animals’. It is time then to move into a global historical reading of the pangolin.

II

GLOBAL TRAFFICKING: EARLY MODERN TO CONTEMPORARY

In thinking with the pangolin, it is necessary to leave to one side the debate about whether or not it is the intermediate host. Indeed, other possible intermediate hosts of the virus, such as snakes, civets or turtles, may present a history symmetrical to that of the pangolin. They, like the pangolin, are not creatures which are normally at the heart of historical scrutiny. Historians of animals have traditionally paid most attention to those animals which are easily domesticated, which are daytime creatures and which star in wildlife propaganda or conservation regimes.

The trafficking of pangolins has grown exponentially in the last decade, so much so that the Western press has labelled it ‘the most trafficked mammal’. China is the greatest consumer. In China, ground-up pangolin scales are used in traditional medicine, fresh pangolin blood or foetuses are considered an aphrodisiac, and the consumption of pangolin parts, for instance tongue, can signify social status and a cultured appreciation of wildness. A group of zoologists led by the University of Oxford’s Daniel Challender estimate that at least 895,000 animals or their derivates were trafficked between August 2000 and July 2019. This number is likely a gross underestimate, as it only includes the illegal traffic that was intercepted.

While China has been central to the trade in pangolin meat, scales and skins, fifty countries have been found to be involved in this traffic over the course of the last decade. Seizures of pangolin parts took place in forty countries. Even in the short

19 Ibid., 2.
20 This paragraph and the following one rely on Daniel W. S. Challender et al., ‘International Trade and Trafficking in Pangolins, 1900–2019’, in Challender, Nash and Waterman (eds.), Pangolins.
space of ten years the trade has changed as pangolin populations have declined in some Asian regions. Between 2000 and 2008 the trade was heavily weighted towards Asian pangolins from Southeast Asia moving to China and Vietnam, but in more recent years other Asian states have been involved and African pangolins have more fully entered the international trafficking network. Though the recent exponential rise in the pangolin trade is undeniable, it builds on a long-standing pattern of trade in this creature through the twentieth century, with Chinese consumption growing step by step. Additionally, Challender et al. note that at one stage in the late twentieth century, there was a significant trade in pangolin skins into the United States and Mexico. The consumption of pangolin in central Africa also results in the killing of a large number of creatures for meat.

This twentieth- and twenty-first-century account of the statistical features of the pangolin trade does not delve deeply enough into the global history of collecting pangolins. For early modern Europeans were also avid collectors of pangolin parts.

After samples arrived in Europe for the first time in the late seventeenth century, a pangolin skin was a prized element of a naturalist’s ‘cabinet of curiosities’. Natalie Lawrence’s doctoral work at the University of Cambridge has been crucial to the recovery of this story. She demonstrates that from the very first accounts penned by Europeans of sightings of pangolins in Asia, there was confusion about how to characterize the creature.  

For instance, Jan Huyghen van Linschoten (1563–1611), a Dutch merchant who served as an assistant to the archbishop of Goa, journeyed extensively in Asia and published a number of accounts of his travels, wrote that the pangolin was ‘a fish of most wonderfull and strange forme’ which has been recovered from ‘the River of Goa’ covered in ‘scales a thumbs breadth, harder than Iron or Steel’. He also noted how the pangolin rolled into a ball and could not be prised open by force or ‘anie instrument’. Linschoten’s inability to fix the pangolin is evident in his description of the creature as a fish and his ready deployment of a visual language of manufacture in writing of the animal with reference to iron, steel and instruments.

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21 See, for example, Natalie Lawrence, ‘Exotic Origins: The Emblematic Biogeographies of Early Modern Scaly Mammals’, *Itinerario*, xxxix (2015).
22 Cited *ibid.*, 25, though some of the interpretation is my own.
Early naturalists consistently confused armadillos and pangolins. This fed into the critique of European understandings of the pangolin expounded by the eighteenth-century French naturalist Georges-Louis Leclerc, Comte de Buffon (1707–88). Buffon sought to lodge armadillos and pangolins in separate geographical blocs: the first belonged to the New World and the second to the Old World. In addition to this taxonomic quandary about where the pangolin fitted (Was it a scaly lizard? Was it a snake or a fish?), there was confusion over the identification of the creature’s parts too. Lawrence demonstrates that natural historical specimens of unusual ‘exotic’ creatures, such as the pangolin, were assembled in Europe through ‘often-ambiguous physical animal parts’. The Amsterdam apothecary Albertus Seba (1665–1736) received a pangolin specimen preserved in the potent alcoholic drink of Sri Lanka, coconut arrack (see Plate 1).\(^{23}\) Assembling a pangolin from various detached skins in poor conditions of preservation further complicated processes of naming and classification. Early modern naturalists’ inability to classify and typify the creature is indicative of the pangolin’s elusiveness in engaging humans. Viewed in the light of present discourse, this avid collecting in Europe refutes the presumption that it is only the Chinese who are obsessed with pangolins.

III

INDIGENOUS PEOPLES AND THE PANGOLIN

Pangolins have been able to attract and sustain many different accounts and traditions. Approaching the naming and classification of pangolins from a totally different cultural perspective, namely that of Asian indigenous peoples, a similar but different set of views appears. Note the following oral riddles and exchanges from Sri Lanka. They were allegedly used by the Väddä or Wanniyalaeto (literally ‘forest dwellers’), a people group who are seen in Sri Lankan to be the Aboriginal inhabitants of the island. These indigenous peoples were of intense interest to anthropologists, including Charles Seligman (1873–1940). Seligman was chair of ethnology at the London School of Economics and together with his wife, Brenda Zara Seligman (1883–1965), wrote *The Veddas* (1911) about Wanniyalaeto.\(^{24}\)

\(^{23}\) *Ibid.*, 18, 20.

\(^{24}\) C. G. Seligman and Brenda Z. Seligman, *The Veddas* (Cambridge, 1911); it includes a chapter by C. S. Myers and an appendix by A. Mendis Gunasekara.
The two extracts below are from a collection of poems which were brought together by Gwladys Hughes Simon, who spent two years in newly-independent Sri Lanka in 1951–3. With the support of the US State Department, Hughes Simon worked with women on the island and with Ceylon’s Department of Agriculture. The mother of her cook, K. R. Ratnayake, was one source for her riddles; another source was her agricultural students and one other was Mr S. A. Wijayatilake, a principle of a Buddhist school in Kandy. She cites her poems connected to Wanniyalaeto life to a journal of ‘oriental studies’ which was titled *Taprobaniang*.25

25 The biography of Hughes Simon draws from Gwladys Hughes Simon and S. A. Wijayatilake, ‘Proverbs from Ceylon about Animals’, *Western Folklore*, xv, no. 4 (1956); see also Gwladys Hughes Simon, ‘Riddles from Ceylon (Part I)’, *Western Folklore*, xiv, no. 3 (1955) and Gwladys Hughes Simon, ‘Riddles from Ceylon (Part II)’, *Western Folklore*, xiv, no. 4 (1955).
The first is said to be a Wanniyalaeto lullaby:

Rocked little one,
Crying little one;
Get to sleep little one.

Roasted little one,
Pengolin, little one!
Sleep little one.26

The second is an exchange between a ‘husband’ and a ‘wife’ who are Wanniyalaeto:

The wife asks:

Tell me the name of the little tooth-armed one in the great Ma-wili ganga [the main river of Sri Lanka];
Tell me the name of the little horn-armed one in the great Ma-wili ganga;
Tell me the name of the little one that breaks roots on the red earth mound;
Tell me the name of the little one that overturns stones on the red earth mound.

The husband replies:

The little tooth-armed one in the great Ma-wili ganga
Is the little white shark, as was said, say wife;
The little horn-armed one in the great Ma-wili ganga
Is the little white catfish, as was said, say wife;
The little one that breaks roots on the red earth mound
The little white pengolin, say its name is, wife;
The little one that overturns stones on the red earth mound
The little wild pig, say its name is, wife.27

These riddles and poems are presented as comic and as indicative of the simplicity of the ‘Ceylonese’ and in particular the indigenous community of the Wanniyalaeto. It is worth adding that pangolins feature in other Sinhala proverbs too.28 There are undoubted biases here, including in the casting of the ‘wife’ and ‘husband’ within European norms of gender. Nevertheless, this verse reveals that indigenous modes of naming are commensurate with early modern European natural historical classification. Note the significance of dental features,

26 Quoted in Hughes Simon, ‘Riddles from Ceylon (Part II)’, 261–2.
27 Quoted in Hughes Simon, ‘Riddles from Ceylon (Part II)’, 264–5.
28 See, for example, John M. Senaveratna, Dictionary of Proverbs of the Sinhalese (Colombo, 1936); e.g. ‘The pangolin’s life is in its head’ and ‘The pangolin who forcibly occupied the porcupine’s hole, swore by his forefathers that he would never leave it.’
outer appearance including ‘armour’, colour, habitat and behavioural character in the extracts.

Wanniyalaeto men smoked pangolins out of their holes; the creature was an important source of protein, alongside, for instance, bee grubs, terrapins, tortoise, bandicoot rats, porcupine, giant squirrel, hare, jungle fowl, mongoose and freshwater fish and eels.29 In the early twentieth century it was noted that Wanniyalaeto used sharpened sticks to dig pangolins out from their burrows.30 According to Seligman and Seligman, this indigenous community called the pangolin ‘bagusa’, ‘eya’ and ‘kabelelewa’. The anthropologists noted that the second of these names overlapped with the word for spiny porcupine and that the last was derived from ‘shell’.31 A 1924 Sinhala–English dictionary also gave the pangolin four distinct names: kaballavā (කබල්ලාවා), mulkodhu (මුල්කොඩු), valdaranayā (වල්දරණයා) and āya (අය) denoting how the island’s inhabitants were struggling with the creatures’ various features in finding a name.32 One possibility is that the main name in Sinhala for pangolin, kaballavā, combines two words, kabal (කබල්) for skull and āya (අය) for porcupine.33 Though these elaborate naming practices align with the confusion of European natural historians, there is something quite distinct and troubling to a European sense of classification in the exchange

29 For perspectives from the social sciences see R. M. M. Chandraratne, ‘Some Ethno-Archaeological Observations on the Subsistence Strategies of the Veddas in Sri Lanka’, Social Affairs: A Journal for the Social Sciences, i, no. 4 (2016) and Patrick Roberts et al., ‘Historical Tropical Forest Reliance amongst the Wanniyalaeto (Vedda) of Sri Lanka: An Isotopic Perspective’, Human Ecology, xlvi (2018). In contrast to these methods, see the critical work of anthropologist Gananath Obeyesekere on his website devoted to the Wanniyalaeto, <http://vedda.org/obeyesekere1.htm>.

30 Henry Parker, Ancient Ceylon: An Account of the Aborigines and of Part of the Early Civilization (London, 1909), 56.

31 Seligman and Seligman, The Veddas, 443–4, nn. 130, 135.

32 Charles Carter (ed.), A Sinhalese–English Dictionary (Colombo, 1924), 105, 152, 506, 568. For the distribution of pangolins in Sri Lanka, see Priyan Perera and Hasitha Karawita, ‘An Update of Distribution, Habitats and Conservation Status of the Indian Pangolin (Manis crassicaudata) in Sri Lanka’, Global Ecology and Conservation, xxi (2020). For a very valuable account of pangolins in South Asia which I found at a late stage of writing this paper with particular attention to princely contexts, see Julie E. Hughes, ‘Thinking (with) the Indian Pangolin: A Human–Animal Perspective on India’s Colonial and Princely Histories’, NMML Occasional Papers: Perspectives in Indian Development, new series xxxviii (2014).

33 I thank Sandagomi Coperahewa from the University of Colombo for this insight.
presented by Hughes Simon as a ‘lullaby’. It blurs the relation between the two ‘little ones’, the child and the pangolin. To identify a pangolin with human progeny is a fundamental form of recognition, especially in a community that reveres ancestors. Meanwhile, the cyclicality of rocking and roasting which is part of this chant allows alternative emotions connected to nurture and ingestion to become aligned.

These two Sri Lankan chants may be compared with another Asian chant, from Meihuashan in Southwest Fujian in China where indigenous traditions connected to village settlements have been maintained over a long period. This means that European natural history is not the only point of comparison for Wanniyalaeto oral culture. The following chant was recorded in the 1990s by the geographer Christopher Coggins and was used by a Chinese hunter before he killed a pangolin:

You’re a lianli [pangolin]
I’m a lilian [reciprocally inverted nonsense word]
You work the mountain
I work the fields
You let me eat you
And I’ll make more money.34

Coggins argues that in China the pangolin is mythic by virtue of its earthiness, leading to it being named an ‘earth dragon’ (dilong). Pangolins are also named for their armament (chuanshanjia) and with reference to their fishy character which is seen to be akin to a ‘carp’ (linli or lianli).35 The pangolin is thought to be safe to eat only if someone else catches and kills it, and no one should kill a pangolin without reciting a chant like this. Coggins writes: ‘The invocation may be humorous … but its intent is serious’. The human who recites the chant addresses the pangolin as a person and asks for permission to slay it; they set out the monetary benefits of killing the pangolin.36 In this East Asian perspective, which is congruent with Coggins’s wider research findings, the pangolin and the human are part of the same cosmological system. This contrasts with a Judeo-Christian tradition which sees humans as set apart from animals by creation.

34 Chris Coggins, The Tiger and the Pangolin: Nature, Culture, and Conservation in China (Honololu, 2003), 1.
35 Ibid., 2.
36 Ibid., 246.
Today, animal extinctions are occurring as indigenous peoples, who are at the frontier of environmental change, see their islands and forests used in dramatically new ways. Such encroachment or colonization is a context for contemporary zoonotic transfer of disease. This is akin to what occurred when Europeans first arrived and settled in new continents. To undo this set of links between zoonotic transfer and environmental change, it is necessary to approach the natural outside colonization and capitalism. As emerging scholarship highlights, indigenous engagements with nature can help in this endeavour. This is why it is important to make space in an article like this for indigenous oral culture connected to the pangolin.37

IV
THE PANGOLIN AND HUMAN COLONIZERS IN SOUTH ASIA

European colonial natural history separated out humans and nature rigidly.38 Human colonization was envisaged as an ‘improvement’ of nature. Nature was turned into a resource within a capitalist system and the plunder of this resource generated persistent structures of inequality. It is with this in mind that the colonial archive may be deconstructed to recover the unstable, evolving and intense intersection of humans and pangolins. In keeping with the commitment here to the distribution of agency across a collection of species rather than simply to the animal or human alone, the colonial archive demonstrates the constraints that pangolins placed on humans who sought to know or tame them as well as the constraints that operated in the other direction.

Colonial natural historians complained of the difficulty of accessing specimens of pangolins, given the nocturnal habits of the creature. Their hunt for skins gave way to a race to rear pangolins and keep them in captivity. The Ceylon Observer of...

37 See, for example, Douglas Nakashima, Igor Krupnik and Jennifer T. Rubis (eds.), Indigenous Knowledge for Climate Change Assessment and Adaptation (Cambridge, 2018). I also note here a recent conference on this topic in the UK which brought a literary studies perspective to this area: ‘Climate Fictions/Indigenous Studies’, Centre for Research in Arts, Social Sciences and Humanities, Cambridge, January 2020, <http://www.crassh.cam.ac.uk/events/28580> (accessed 3 June 2020).

38 There is a vast literature on the origins of natural historical knowledge. For a start, see H. A. Curry et al. (eds.), Worlds of Natural History (Cambridge, 2018).
1904 noted in reference to a collection of live animals at the Colombo Museum in Sri Lanka that ‘the most difficult animals to rear are insectivorous creatures, such as the pangolin or scaly ant-eater’. As with other creatures who faced the colonial onslaught, the challenge of the chase fed into more human interest and a desire to tame the creature. James Emerson Tennent (1804–69), an early historian of Sri Lanka and colonial official, wrote that ‘very little’ was known of the pangolin by the indigenous people of the island, ‘who regard it with aversion, one name given to it being the “Negombo Devil”’. He carried on:

Those kept by me were generally speaking, quiet during the day, and grew restless and active as evening and night approached... When frightened, they rolled themselves into a rounded ball; and such was the powerful force of muscle, that the strength of a man was insufficient to uncoil it.

The way in which the pangolin rolled up into a ball to evade human contact was a continuing theme. Nevertheless, Tennent triumphantly pronounced that one of his creatures was ‘gentle and affectionate’. Elsewhere, the complaint of the pangolin’s lack of interest reappeared: a 1905 article in the Ceylon Observer noted that pangolins did not ‘play’. An 1899 correspondent to the same newspaper asked urgently: ‘Is it possible to skin the Ceylon Armadillo (Sinhalese Kabaleewa), and is there a specimen of one in the Colombo Museum?’ At the Colombo Museum, exhibitions of pangolin skins were followed by displays of live creatures, and the names of donors were acknowledged in the press in the early twentieth century.

In the mainland, the transition from orientalist animal study in the late eighteenth century to the expansion of colonial settlement and its attendant engagement with nature should be kept in view. This wider chronology of human colonization brought about different pangolin–human relations. A very good

39 Ceylon Observer, 28 Apr. 1904.
40 James Emerson Tennent, Sketches of the Natural History of Ceylon (London, 1861), 48.
41 Ibid., 46.
42 Ceylon Observer, 2 Nov. 1905.
43 ‘Correspondence to the Editor: The Ceylon Armadillo or Rather the “Pangolin”’, Ceylon Observer, 26 July 1899.
44 See, for example, Ceylon Observer, 23 July 1903. For a donation of a live pangolin by Miss Rockwood, see Ceylon Observer, 4 May 1905; for a donation by Mr Andriezen, Ceylon Observer, 10 July 1905; for a donation by Mr H. Stork, Ceylon Observer, 22 Mar. 1905.
entry-point to the late-eighteenth-century moment is Patna artist Shaikh Zain ud-Din’s gouache on paper representation, ‘Lady Impey’s Pangolin’ (1779) (see Plate 2). Lady Impey, the wife of Calcutta’s chief justice, kept a large collection of creatures including a fruit bat, a dwarf flying squirrel, a ‘mountain rat’ and a pangolin. Zain ud-Din’s natural historical illustration is seen to combine Mughal and European norms of illustration and he has recently been described as one of the ‘greatest Indian painters of the eighteenth century’. But what is striking about the image is the lack of any context and even a lack of curiosity demonstrated either by the artist or the pangolin. Indeed there are other images of pangolins which are very similar. Was this a stock image of a pangolin in this period rather than a particular blend of European and Mughal natural

45 See Caroline Grigson, Menagerie: The History of Exotic Animals in England (Oxford, 2016), 146.
46 See William Dalrymple, Forgotten Masters: Indian Painting for the East India Company (London, 2019), 40.
history? The style is also in keeping with an image produced by another artist of a different Impey specimen, namely that by Bhawani Das of a fruit bat, drawn the year after the image of the pangolin.

Zain ud-Din’s pangolin may be placed next to the important orientalist, philologist and judge William Jones’s lack of interest in receiving a pangolin. The Joneses and Impeys were friends and Zain ud-Din worked for William Jones too. An image of a pangolin given to Jones was published as a print in the first issue of the *Asiatick Researches* (1788).48 Jones wrote of this pangolin that, when it had been brought from ‘the mountains’ against his wishes, ‘I solicited his restoration to his beloved rocks, because I found it impossible to preserve him in comfort at a distance from them’. Jones preferred to immerse himself in ‘oriental’ texts about animals.49 This disengagement from nature is in keeping with the textual immersion of the period and with its commitment to natural theology and order. The pangolin was problematic for those in search of divine design, precedent and progress: what was it for and why did it look like it did? An 1807 paper written by a colonial Indian dissector of a pangolin set out its ‘inoffensive’ or unexceptional features; the author struggled to present a theological argument for why it had a ‘coat of mail’.50

Moving into late colonial India, however, the expansion of settlement — as in Sri Lanka — generated new interest which was channelled through concerns typical of the age over conservation and domestication. One excellent example of this interest is the Indian forester and wildlife photographer F. W. Champion’s book of 1933, *The Jungle in Sunlight and Shadow*. Champion provided a hyper-real sequence of photographs of pangolins; these were completed with the assistance of two

47 See, for example, ‘Chinese Pangolin “Manis pentadactyla”’, watercolour, British Library Images Online, NHD 32/24, K90087-96; also the plate referred to in the following footnote.

48 See the plate accompanying Matthew Leslie, ‘On the Pangolin of Bahar’, in *Asiatick Researches; Or, Transactions of the Society Instituted in Bengal, for Inquiring into the History and Antiquities, the Arts, Sciences, and Literature, of Asia*, i (1801), 376–8. For Jones’s receipt of the pangolin see Adam Burt, ‘On the Dissection of the Pangolin, in a Letter to General Carnac from Adam Burt Esq.’ in *Asiatick Researches*, ii (1807), 277–80.

49 William Jones, ‘The Tenth Anniversary Discourse, Delivered on 28 February 1793’, in *The Works of Sir William Jones* (London, 1799), 154.

50 Burt, ‘On the Dissection of the Pangolin’, 277.
Indians, Mahendra Singh and Karim Baksh. He began his chapter on pangolins by nominating the creature as ‘the most remarkable animal to be found in the Indian jungles’. But in keeping with the nostalgia and sense of decline that pervaded this period, the pangolin was presented as a ‘weird creature’, ‘like a knight of the medieval ages’. In an indication of the advances of colonial hunting through the course of the nineteenth and twentieth centuries, Champion noted that the creature’s scales could ‘turn even a modern rifle-bullet, which would have gone straight through the iron armour of man’. Like other observers, Champion complained of the difficulties of accessing the pangolin: ‘It is extremely nocturnal... The pangolin is an exceedingly difficult animal to study in the wild, for he spends most of his life underground and very rarely appears above the surface in the daytime’. He presented a perhaps exaggerated tale of how pangolins evaded him:

I well remember one occasion in the early hot weather when my wife and I, with the assistance of three or four men, dug for hours and hours, getting hotter and hotter, and yet never seemed to get nearer to the pangolin, which we knew was inside because of fresh tracks going in, and also from the presence of a number of flies deep down in the hole. I am not at all sure that the occupant, hearing our approach, was not digging himself further in... In Champion’s narrative, the pangolin’s evasion went a few steps further, for those pangolins which he was able to capture exercised their power against the conditions of their enclosure. Domesticity came under attack. What better evidence for the pangolin’s resistance against human colonization than Champion’s tale of how a pangolin attacked his bathroom?

One specimen placed for comfort in the bathroom of my stone-built bungalow, the floor of which was plastered with what passes for cement in India. Within an hour he had dug up the floor in several places, and finally, choosing a spot near the wall, he had removed several stones weighing ten pounds or more each.

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51 The photographs of the pangolins appear in F. W. Champion, The Jungle in Sunlight and Shadow (London, 1933), ch. 3; for acknowledgement of assistance see 3.
52 Ibid., 24–5.
53 Ibid., 27.
54 Ibid., 29.
In yet another tale, a pangolin set about attacking Champion’s rear-end when he placed the creature in a wooden packing-case and sat on the box.55

These stories of the captivity of pangolins and their response to captivity demonstrate not simple evasion but an active aversion to human engagement with them. But they should not be read as indicators of simple animal agency; rather these are signs of the interspecies frontier. Champion’s narrative points as much to human attempts to control pangolins as to animal responses to human colonizers.

V

TOWARDS A POST-PANDEMIC HISTORIOGRAPHY

By the time this article appears there may be further scientific claims about whether it was a pangolin or another creature such as a civet or snake which was the intermediate host of COVID-19. There may be yet more stories about the escape of the virus from a Chinese laboratory. Human attitudes to nature might return once again to pre-lockdown patterns of heavy pollution, globalization and exploitation. To look for a new scientific breakthrough in the identification of the animal which was the ‘culprit’, or in what medical anthropologist Christos Lynteris’s important work terms the hunt for the ‘epidemic villain’, misses the point of these reflections from the long and global history of engagement with pangolins.56 Indeed, the danger of identifying a villain, or in taking this account to indicate literally that ‘the pangolin caused COVID-19’, is that this would spell disaster for pangolin populations.57 Similarly, blaming the ‘wet market’ in China and calling for a closure of all wet markets may in fact create a more industrialized mode of consuming meat in China without lessening the possibility of zoonotic transfer.58

Rather, COVID-19 arises from the human–animal interface. The pangolin’s response to human domestication and to human

55 Ibid., 30.
56 Christos Lynteris (ed.), Framing Animals as Epidemic Villains: Histories of Non-Human Disease Vectors (Basingtoke, 2019).
57 See however the most recent news of how China is attempting to remove pangolin scales from the ingredients approved for use in traditional medicine. Michael Standaert, ‘China Raises Protection for Pangolins by Removing Scales from Medicine List’, Guardian, 9 June 2020.
58 See, for instance, John Vidal, “Ban on Bushmeat” After Covid-19 But What if the Alternative is Factory Farming?, Guardian, 26 May 2020.
attempts to colonize and fix it within human knowledge systems are in keeping with the wider pressures of the late modern moment deriving from accelerating environmental change and ecological transformation. If the human–pangolin relationship was unstable and liable to oscillation between detachment and engagement, that relationship has now entered a new phase where pangolins are heavily exploited with little space to move. Their plight is shared with many wild creatures with which humans have not had sustained contact. It is a story that differs significantly from the accounts of human engagement with big beasts or lovable and docile animal friends.

It is precisely from a context where there has been long-term instability in the human–animal relationship that zoonotic disease transfer is likely. This instability might include a sequence along these lines: little past contact accompanied by modes of evasion, ignorance, interest or confusion, giving way to heavy contact. That was what characterized the pangolin–human story. Unstable human–animal relations should also include highly capitalized breeding of creatures, as a result of which animal populations become ideal pools for disease because they do not show much genetic variation and, accordingly, resistance to disease. The dynamic of the pangolin–human story may also hold for the relations between snakes and humans or bats and humans, the kinds of creatures which are among the other contenders for places in the transmission chain of the virus.

In getting to the heart of unstable human–animal encounters, it is vital to take taxonomic difficulties seriously. To name the pangolin a subject which is set apart is to minimize the difficulties of those comparing SARS-CoV-2 samples taken from humans with those viruses carried in pangolins. The way ahead for historians may not lie simply in decentring the human and centring the animal. The interlocking crises of the pandemic and of climate change call for a multi-species and even trans-species history that is about the assembly of various life forms and things as generative of historical change. This may allow the inclusion of the virus itself as part of the complex in which agency lies. If collaboration is already critical in various forms of historical writing, given that no scholar can master every language or every kind of source, collaboration is even more acutely needed in more-than-human histories. Such histories will rely on work across science and history and archaeology, and anthropology
too. But this collaboration would be in keeping with the call to include more historical agents in the stories that we tell. A historical study that is not species-specific may in turn move beneath and beyond the assumption that history should have a single species at its core. It may also identify medicines and vaccines as entangled with diseases and species in a material and discursive relationship, as for instance Rohan Deb Roy, the historian of malaria and South Asia, has recently done.\textsuperscript{59}

Indigenous oral cultures about the pangolin are useful as a foil for the various biopolitical and security solutions that governments are now even more likely to use in taming nature, people and the pandemic. There is another poem about pangolins, sent to me by a colleague who saw me across the street and stopped for a socially-distanced conversation in ‘lockdown’. It comes from the American modernist poet Marianne Moore’s \textit{The Pangolin and Other Verse} (1936) and provides a fitting conclusion to these reflections. Here the pangolin becomes a machine and a thing, strengthened by ‘adversities’, confusing to ‘simpletons’, and ‘uninjurable’.\textsuperscript{60} One can only hope that this staying power will outdo the humans who may turn against pangolins in a post-COVID-19 world.

\begin{quote}
The giant-pangolin-tail, graceful tool, as prop or hand or broom or ax, tipped like an elephant’s trunk with special skin, is not lost on this ant-and stone-swallowing uninjurable artichoke which simpletons thought a living fable whom the stones had nourished, whereas ants had done so. Pangolins are not aggressive animals; between dusk and day they have the not unchain-like machine-like form and frictionless creep of a thing made graceful by adversities, conversities.\textsuperscript{61}
\end{quote}

\textsuperscript{59} Rohan Deb Roy, \textit{Malarial Subjects: Empire, Medicine and Nonhumans in British India, 1820–1909} (Cambridge, 2017).
\textsuperscript{60} For Moore’s sources see Fiona Green, ‘Moore, Pound, Syllabics, and History’, \textit{Twentieth-Century Literature}, lxiii (2017).
\textsuperscript{61} Extract from Marianne Moore, ‘The Pangolin’, in \textit{The Pangolin and Other Verse} (London, 1936).