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Apiculture in the Anthropocene: between posthumanism and critical animal studies

Richie Nimmo

The concept of the Anthropocene encapsulates an interesting paradox; it contains the seeds of divergent ways of thinking which, if not quite contradictory, certainly pull in different directions. This chapter explores the implications by tracing this tension through the relationship between critical and posthumanist currents in human–animal studies. The theoretical discussion is worked through and grounded in a case study of a contemporary environmental crisis involving non-human animals, specifically the escalating crisis of honeybee apiculture that has come to be known as colony collapse disorder (CCD).

At one level the notion of the Anthropocene could be regarded as quintessentially posthumanist in its firm rejection of the notions of human separation from – and transcendence of – the natural world that are at the core of the modern humanist worldview. Instead the Anthropocene asserts the thoroughly terrestrial nature of human beings as *Homo sapiens*, and emphasises our interconnectedness with – and inescapable dependence on – the planetary biosphere. But there is also within the concept the lingering root of a fundamental humanist idea.

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An acknowledgement of the sheer scale of the effects of human activity upon the planet is at the heart of the concept and underpins the force of its invitation to critical self-reflection; but in accomplishing this by stressing that no other animal species has ever had a comparable impact on the Earth, it simultaneously invites the sort of emphasis on the ostensibly exceptional nature of human beings that features so prominently in humanist thinking. Though intended as a warning and a call for change, this slips all too easily into the characteristic hubris of humanism, inadvertently reaffirming its secular theology of unlimited human self-creation, autonomy and self-mastery. Thus the Anthropocene concept contains what one might think of as an ambivalent posthumanism, inviting us to reflect on our existential status as one biological species among many others inhabiting a finite planet, while seeming to continue to whisper the humanist promise that we are still the centre of the world and capable of being the absolute masters of our fate. The former is a call for human modesty about being human; the latter is anything but that.

Yet something resembling this lingering humanism seems difficult to avoid within any discourse that calls for collectively taking responsibility, for action and for change, not least at the level of the species. A certain residual humanism is entangled here with the adoption of a 'critical' approach, since a recurrent feature of critique – or more precisely, the mode of critique commonly mobilised within forms of ecocriticism – is that it seeks not only to describe a state of affairs, and perhaps to change ways of thinking about reality, but also marks a call to action and a demand for structural change in the world; the point, as Marx famously argued, is to change it. This sort of critical stance has attracted criticism for its tendency to suppose that an external vantage point on the object of critique is somehow attainable, and thence to elevate the ostensibly privileged knowledge of the critical theorist above that of everyday knowledge (Boltanski 2011; Cooper 2013, 83–85). Extending this, one might make the related point that this kind of critical strategy is predicated on – indeed, insists on – the attribution of ultimately determinative responsibility to human beings, which in turn, presupposes a rather strong conception of human agency. If we are to believe that we can use our critical understanding of the world in order to change it decisively, we then have also to believe that we possess

the capacity to do so, which is to say that we have the ability not only to transcend our circumstances and seize our destiny but to do so collectively as a species. As Boria Sax points out with devastating honesty, this is the archetypical humanist conceit:

Each of us may individually feel nearly helpless as we contemplate a vast number of threats from personal bankruptcy to global warming . . . Nevertheless, ‘humanity’ itself seems nearly omnipotent. Since it is rather like the way that the Greeks personified lightning as Zeus and the sea as Poseidon, the personification of humankind as a dominant figure is, in very literal ways, a myth. Far from being unified, we human beings barely keep our tendency toward mass slaughter of one another under fragile and sporadic control. We are nowhere remotely close to being able to consciously guide the course of history or even the evolution of technology. ‘Anthropocentrism’ is this tendency to vastly exaggerate human dominance, understanding, power, autonomy, unity, guilt, virtue, wickedness, and morality. (Sax 2011, 35–36)

There is, therefore, perhaps not quite an irreconcilable contradiction, but certainly a persistent tension, between critical approaches underpinned by a humanist ontology and rooted in a politics of responsibility and transformation, and the sort of posthumanism that would play down the decisiveness of human agency and stress instead that, insofar as it is a significant term at all, agency is not an exclusive property of human beings – in fact it is not a property of entities, but must be understood as relational.

In this vision, agency is not just about the interplay of reflexive human intentions and social–structural conditions, as in most sociological accounts, but is emergent from hybrid assemblages encompassing relations between heterogeneous actants, both human and non-human (Latour 1993; 2005, 63, 70, 75–76; Michael 2000, 1). In the posthumanist refiguring of agency developed in Karen Barad’s ‘agential realism’, for example:

Agency is a matter of intra-acting; it is an enactment, not something that someone or something has. Agency cannot be designated as an

attribute of subjects or objects (as they do not preexist as such) . . . it seems not only appropriate but important to consider agency as distributed over nonhuman as well as human forms. (2007, 214)

Thus agency is shaped by the co-presence of multiple intra-acting material-discursive and biosocial networks, such that human intentions are merely one element in an open-ended and dynamic ensemble of more-than-social relations. Consequently, human intentions are variously generated, frustrated, mediated, transformed and enabled by other entities and by other energies, such that contingencies proliferate and unintended consequences are legion; as Haraway puts it '[h]istorical specificity and contingent mutability rule all the way down, into natureculture, into naturecultures' (2003, 300). In this way posthumanism decentres the humanist subject-agent by unmasking the co-constitutive entanglement of humans and non-humans in a materially heterogeneous world (Knappett & Malafouris 2008). Such refusal to be anthropocentric about agency, in turn, complexifies and problematises the residually humanist notions of responsibility that tend to be implicit in many 'critical' approaches, pointing instead towards a different kind of responsibility and a different sort of politics.

Colony collapse disorder

The phrase 'colony collapse disorder' was first used early in 2007 to refer to the alarming phenomenon of dramatic, large-scale and unexplained disappearances of honeybee colonies, initially among commercial pollinators in Florida and California during the autumn of 2006 (Cox-Foster, Frazier et al. 2007). These were believed to be distinct from the periodic losses that are a routine hazard of beekeeping due to a number of characteristics: firstly the sheer scale and suddenness of the losses – with large and apparently thriving colonies sometimes disappearing in no more than a fortnight; also due to the peculiar absence of the normal invaders, such as wax moths or beetles, that would usually take advantage of the absent colony to consume the significant stores of honey remaining in the hive. Another distinctive feature was the relative absence of the bee carcasses that would normally be found within the

hive and littered around the entrance to collapsed colonies. Moreover, those carcasses that were discovered, when later subjected to pathological analysis, were found to be suffering from a bewildering array of viruses and infections, as though their immune systems had collapsed. These features combined to create the sense that this was something never before encountered; ‘colony collapse disorder’ – or CCD – was born. After some initial scepticism, the scale of colony losses across 22 states of the USA by the spring of 2007 had given credence to the idea that CCD was real, and it began making headlines worldwide in the context of raising alarm at the potential impact on pollination, hence food production and the agricultural economy, if such a rapid rate of colony losses continued. Before long reports of honeybee losses across the world were being linked to CCD, in Canada, Taiwan, Spain, Portugal, Italy, France, Poland, Austria, Belgium, the Netherlands, Croatia, and the UK.

The first scientific research programs attempting to identify the cause of CCD began soon after. The plausible candidates included: the widespread use of the new class of pesticides known as ‘neonicotinoids’, developed in the 1980s and widely used since the 1990s, nerve toxins that were suspected of detrimental effect on the apian nervous system, even at sub-lethal doses; the apparently unstoppable progress of parasites such as the parasitic *Varroa* mite and associated viruses such as the *Nosema* infection and Israeli Acute Paralysis Virus, introduced into vulnerable honeybee populations by migratory pollination and the under-regulated transcontinental trade in honeybees; a loss of genetic diversity due to poor breeding practices favoured by some commercial breeders; the possible unintended consequences of GM crops in weakening bee immune systems; the over-intensive exploitation of honeybees in monocultural commercial pollination, leading to intolerable migratory stresses on that species and crowding out native pollinators; the increasing frequency of unseasonal weather, known to affect the reproductive and foraging cycles of bee colonies, due to accelerating climate change; and, finally, changing landscapes involving the loss of areas of diverse flora such as wildflower meadows that long played a vital role in sustaining native bee populations.

Despite ongoing investigations at numerous institutions, none of these has yet emerged as a convincing candidate for a sole causal ex-

planation of CCD. Early claims by entomologists and genetics analysts to have isolated the pathogenic agent most directly responsible for CCD as Israeli Acute Paralysis Virus proved premature, and were soon discredited, but not before imported honeybees from Australia were erroneously identified as the source of the problem in the USA, with significant consequences for Australian bee exporters (Cox-Foster, Conlan et al. 2007; Anderson & East 2008). Much subsequent research has stressed the major roles played in the ongoing problem of honeybee decline by *Varroa*, *Nosema* and other pathogens, but CCD cannot be convincingly attributed to any one of these alone (Genersch et al. 2010). Moving from biological pathogens to human-made toxins, there are sharply conflicting views on the effects of neonicotinoid pesticides on bees, with both sides able to selectively cite entomological and pathological research that appears to support their position (Maxim & van der Sluijs 2013; Schmuck 2013; Henry et al. 2012). Many beekeepers, some of whom have found their livelihoods threatened by CCD, have been convinced for some time – often based on several decades of experience – that neonicotinoid pesticides are centrally to blame, and many have campaigned vigorously with a range of environmental groups to have those chemicals banned. They secured a significant victory in April 2013 when the European Union imposed a moratorium on the use of neonicotinoids for two years in member-states pending further investigation, on the basis of a report by the European Food Safety Authority (EFSA) which concluded that these pesticides pose an ‘acute risk’ to honeybees (EU Regulation 485/2013). Meanwhile pesticide manufacturers such as Bayer Crop Science and Syngenta, whose profits rely on routine agricultural use of these products, have lobbied intensively against this, and have funded research on the causes of CCD intended to help exonerate neonicotinoids. In September 2013 these companies began legal action against the EFSA in an attempt to overturn the ban. Clearly then, the debate about CCD has been far more than simply an arena of disinterested scientific investigation; it has been a cosmopolitical struggle between different ways of knowing ‘nature’, contrasting ontologies, and rival visions of society–nature relations.

With CCD having been first recognised in 2007, it seems increasingly unlikely that any specific causal agent will be identified as being responsible, and the scientific consensus belatedly emerging is that the

phenomenon may be multi-causal, with several factors potentially interacting in highly complex ways (vanEngelsdorp et al. 2009; Neumann & Carreck 2010, 1–6; Williams et al. 2010, 846). It nevertheless remains unknown whether the acceleration of honeybee decline marked by CCD represents the intrusion of some new, and as yet, unverified pathogenic or toxic agent into the honeybee ecosystem, as was initially suspected and as the anti-pesticide campaigners maintain, or if it is better understood as a ratcheting-up of the many known pressures on honeybees. The following section takes this up by beginning to delineate the basis of a critical animal studies approach to understanding CCD.

Honeybees as livestock

Media references to CCD often invoke ‘a crisis of bees.’ There is such a crisis, consisting of a long-term serious decline of native pollinators, but this is not synonymous with CCD, which is more precisely a crisis of the Western honeybee, *Apis mellifera*. This is an agricultural–economic crisis as much as an environmental one, since the Western honeybee is the pollinator of choice for much of the world’s commercial agricultural crops (Klein et al. 2007, 303–13). In developing a critical perspective on apiculture it is useful to consider categorisations of honeybees as a kind of ‘lilliputian livestock – fuzzy herbivores with wings’ (Buchmann & Nabhan 1997). The species has been selected for its prolific rate of honey production and pollination, transported around the world with global flows of colonial power and capital, and is now heavily relied on as an intrinsic component of the system of agricultural mass production known as monoculture (Williams et al. 2010, 845). This can be seen most clearly in the almond industry in central California, where 644 km of orchards depend entirely on honeybees trucked in seasonally by commercial pollination operators from across the USA – and when necessary flown in from Australia – in order to pollinate its 60 million almond trees, which supply more than three quarters of the world’s almonds (Traynor 1993; Singeli 2007). This is not an isolated case; Californian almond farming is the most dramatic example of an intensively industrialised monoculture, heavily reliant on commercial apiculture

for pollination, but it is by no means the only example, and it represents the model towards which many other branches of agriculture are moving, driven by the relentless logic of rationalisation, standardisation and intensification. As with many other forms of animal agriculture, this process is most advanced in the USA, but the particularity of the American case should not be overstated; large-scale monocultures around the world are similarly dependent upon the 'pollination services' provided by *Apis mellifera*, the most prolific of all pollinators (Aizen & Harder 2009, 915–18).

Clearly then, insofar as CCD is characterised by the sudden and large-scale collapse of honeybee colonies, it marks a serious crisis of agriculture, much of which would quickly be rendered non-viable if honeybees were to disappear (Aizen & Harder 2009, 915–18). A sobering glimpse of this scenario can be observed in Sichuan Province in China where every pear tree has had to be painstakingly pollinated by human workers since all honeybees were wiped out by pesticide misuse more than 20 years ago (Tang et al. 2003, 14–15, 18). This case has only underlined the value of *Apis mellifera*, as the best efforts of human pollination have been unable to even approximate the efficiency of honeybees and have resulted in much lower levels of fertility, and at a huge financial cost. To imagine this scenario repeated throughout world agriculture is chilling in its implications. To regard CCD as a 'crisis of bees', however, is to take the dominance of *Apis mellifera* as given and to marginalise the many other species of native bees that performed the work of pollination perfectly well before the globalisation of the Western honeybee and the industrialisation of agriculture (Buchmann & Nabhan 1997). It also normalises the monoculture system of food production with its increasing dependence on commercial honeybee apiculture for pollination. According to this way of thinking, a crisis of the honeybee is a world crisis of natural fertility – an almost apocalyptic scenario from which it follows that the only solution is to 'save the honeybee' in order to return to business as usual. A critical approach, in contrast, would involve refusing to normalise the status quo, pointing to the contingency and unsustainability of the current system, and stressing the urgent need for a less intensive and more diverse agriculture.

In this light, the irony of the ubiquitous ‘save the honeybee’ sentiments and campaigns that have sprung up since 2007, however well meaning, is that the international proliferation of the honeybee is inseparable from the forms of agricultural organisation that have led to the steady decline of native pollinators and have engendered the rationalising practices that ensured it was only a matter of time before something like CCD occurred. As scholars in critical environmental sociology have long argued, the natural world is not as infinitely malleable as modernism likes to believe; complex natural systems and processes are amenable to only so much human manipulation and intensification before they tend to reach some sort of critical tipping point, giving rise to any number of unforeseen consequences (Catton & Dunlap 1980; Benton 1989; 1993; Dickens 2004, 100–103, 115). This may be something of a well-worn realist refrain, but it is borne out by a litany of environmental crises in recent decades, from bovine spongiform encephalopathy (BSE) to avian flu, and from antibiotic resistance to climate change. In short, therefore, a system based so exclusively upon the pollination work of a single species is manifestly unsustainable, and from a critical perspective it is this, rather than any single specific causal agent, that is ultimately behind the honeybee’s decline. That is not to deny the likely role of pesticides such as neonicotinoids in significantly accelerating CCD, but a critical approach means going beyond the search for mono-causal explanations and acknowledging that a genuinely sustainable solution would have to involve not only a far less chemical-intensive agriculture but also a managed decline of industrialised apiculture and a diversification of pollination.

A critical approach to apiculture then is valuable on a number of fronts: firstly, drawing on the suggestive concept of the ‘animal-industrial complex’ developed by scholars in critical animal studies (Noske 1989, 22–39; Adams 1997; Twine 2012), its structural lens provides a means to grasp what we might call the ‘apis-industrial complex’. This avoids focusing more narrowly upon the ethical and environmental problems pertaining to practices that constitute fragmentary elements of this complex, such as pesticide use or long-distance migratory pollination. Considered in isolation these may appear to be potentially solvable through reform, within the status-quo, but a critical approach demands acknowledgement that all such problems ultimately stem from

the industrial capitalist political-economic structure of the system. As David Nibert (2003, 17) puts it, 'such practices are inevitable in a selfish and profit-driven economic system that has fostered agricultural concentration.' This, in turn, lays the ground for arguing consistently for a structural transformation and radical alternative (Best 2009). In addition, by grasping honeybees in terms of their structural role and position within this complex, hence as a kind of 'livestock', a critical approach is well positioned to explain why this species – like many other intensively farmed 'livestock' animals – is being pushed to its biological limits, and very likely beyond, by processes of rationalisation and intensification. In this way a critical approach effectively grounds a politics of opposition to commercial apiculture as an instance of a much wider industrial-animal agriculture or 'agribusiness'.

Of hives and hybrids

Yet this is not quite satisfactory empirically, as there are significant differences between honeybees and the animals usually signified by the term 'livestock'. The various species of mammals that make up the majority of agricultural animals are far more unambiguously 'domesticated' than honeybees, with a long cultural history of being discursively positioned in some ambivalent conceptual space between 'wild' and 'domesticated'.

According to the humanist ontological architecture underpinning the concept, domestication involves a species becoming no longer 'wild', as human intervention, manipulation and control move the species from the sphere of 'nature' to that of 'culture'. Even for those such as Stephen Budiansky (1999) and Roger Caras (2002) who want to stress the agency of non-human animals in the process of domestication, so that it is no longer synonymous with domination and is seen as having been in some sense 'chosen', the result of this co-evolutionary process is still that the animal is no longer 'wild'. In this way of thinking, kept honeybees are domesticated insofar as beekeepers routinely make interventions into their reproductive processes, enabling them to manipulate the rhythms of the colony, aiming, for example, to inhibit the occurrence of colony division through swarming and thus promote

uninterrupted honey production (Chandler 2009, 91). Kept honeybees also live in human-made hives specially constructed in such a way as to facilitate the extraction of honey by humans without destroying the honeycomb and damaging the hive. In these respects, kept honeybees are comparable to other 'livestock'.

Yet honeybee colonies manifest such complex social organisation and specialised division of labour that honeybees have long been seen as social beings in their own right, not just as animals that have been domesticated by virtue of being enfolded within the structure of a human 'social' domain, or, conversely, as part of a wild nature defined by its separation from human society. This wild/domesticated binary relies on an anthropocentric equation of sociality with humanity, and non-humanity or nature with a-sociality, such that to be social is to have been humanised and thereby denaturalised; but bees problematise this by asserting their existence as social creatures, with their own complex form of sociality. Honeybee colonies were perceived as micro 'societies' many centuries before developments in ethology began to attribute sociality to a range of non-human mammals such as primates, and they continue to be regarded as the paradigmatic 'social insect', inviting myriad conceptualisations of the 'politics' of the hive (Preston 2006; Seeley 2010). Some of the most recurring symbols of collectivity and sociality in numerous cultures are apian or bee-related, and an oft-repeated beekeeping proverb states that *una apis, nulla apis* – 'one bee is no bee', underlining the significance of the fact that apiculture is always the relationship of a human individual or group of humans with a collective comprising many thousands of bees. Beekeepers do not enter into relationships with individual bees, they do not concern themselves with the health or welfare – let alone the 'rights' – of any individual bee; every individual is a manifestation of a multitude, the colony, and it is this multitude with which beekeepers are engaged. Hence 'almost none of the standard western ideas of individuality and autonomy of self have any purchase in the study of bees' (Preston 2006, 15).

It is also significant that the activities of honeybees have long been seen as a form of 'work', as labour in an almost human sense, not simply as natural behaviour. This is reflected in Marx's famous comparison of the skill and ingenuity of honeybees, in the construction of their honeycomb chambers, with that of human architects (1976, 284). He goes

on to argue that the difference between the labour of bees and that of human architects is that, whereas the bees operate on instinct, according to a blueprint drafted by evolution, the human architect designs the structure consciously in the mind before constructing it in reality (Ingold 1983; Benton 1993). In this way Marx toys with the non-anthropocentric idea of bees as labourers, hence as social beings, before moving to place bees firmly back within the domain of nature, by contrasting their ostensible lack of conscious agency with that of human beings.

It is worth carefully noting the conceptual status of labour that underpins such thinking. Labour is conceived of as purposeful activity upon nature, transforming something natural – a raw material – into an artefact or manufactured good, into something useful, a social thing. Marx refers to honeycomb, but it is honey itself that is most telling in this respect. Honey is commonly seen as a naturally occurring raw material and, at the same time, as in some sense manufactured, because it is produced within highly organised apian societies by ‘worker’ bees dedicated to its production. Claude Lévi-Strauss, for example, located honeybees in a liminal zone between nature and culture, pointing out that even wild honeybees are markedly ‘civilised’ in their collective and organised labour of transforming nectar into honey, and suggesting that honey is thus better seen not as ‘raw’ but as ‘cooked’ (1973, 28, 35, 55, 289). Yet the cooks here are non-human, and in this sense honey is still categorised as ‘natural’ because, apart from the work of managing the hives and periodically extracting the ready-made honey and putting it into jars, no human labour enters into its production; the alchemic work of converting nectar into honey is performed entirely by the bees. This is reflected in the marketing of honey as a ‘natural’ product, and often as a ‘natural’ alternative to sugar and other ‘artificial’ sweeteners. Thus the ambiguous cultural status of honey as both given by nature and manufactured, raw and cooked, natural and cultural, underlines the highly liminal status of honeybees themselves, as non-humans engaged in highly organised production of an artefact valued by humans. Other animals produce things of value to humans, but not through such highly organised collective activity that lends itself so easily to being categorised as ‘work’; and other animals produce things through highly organised activity, but not things that are highly valued by human be-

ings. Moreover, there are no other 'livestock' animals whose products we consume, but whose bodies we do not.

For these reasons, beekeeping has tended to be perceived and to be represented not simply as another example of domestication but as a more hybrid or mutual endeavour, involving a form of interspecies collaboration between bee societies and human societies. Certainly honeybees are not easily categorised as domesticated agricultural animals without neglecting much of what is specific and unique about human–apian relations. As Claire Preston puts it, '[i]f bees have some of the instincts of the herd, they are not precisely *domestic* animals. Fortunately, they consent to inhabit artificial hives which have been devised for them, but their relationship to man is better conceived as symbiotic, with each species benefiting from certain behaviours and capabilities of the other' (2006, 34). Honeybees are not subjected to the sort of human confinement and close control that arguably defines the lives of 'cattle'; the modern beehive is not the equivalent of a fenced-in field or cage, let alone a factory farm; it is not a disciplinary container bounded by the human will-to-control, but is better described as an apparatus that stages and mediates a co-constitutive interaction between bodies, an iterative material enactment the outcome of which is always at least partly open-ended, contingent, and negotiated.

Beekeepers have traditionally described their activities in terms that are distinct from those of the farmer, or those of the petkeeper, but which are instead suggestive of a practice with its own specific set of ontological coordinates on the cultural map of human–animal relations (Wilson 2005, 231–71). In the words of one practising beekeeper, 'the way forward is to work closely *with* the bees, developing a relationship based on mutual benefit and cooperation rather than simple exploitation' (Chandler 2009, 7). Such practitioners' understandings should perhaps not be taken at face value, but nor can they be dismissed out of hand in a presumption of superior insight on the part of the critical theorist. The role is that of a bee *keeper* and the activity is bee *keeping*, not bee farming or bee minding, and this terminology is not insignificant. It is consistent with the term *apiculture*, where the etymological root of 'culture' refers to cultivation – one *cultivates* bees, hoping to create the conditions for them to flourish and to produce excess honey. However, one cannot simply force them to do so through

the imposition of ever-greater control, in the way that cattle may be forced to provide milk, chickens to provide eggs, and all animals to provide meat. If too much honey is removed from the hive and there is not enough left for the colony then it will not survive the winter, which is a serious loss and failure for the beekeeper (Preston 2006, 35–36). Thus, unlike some other forms of animal agriculture, increased productivity in this case depends on the animals thriving and cannot easily be accomplished instrumentally at a cost to their wellbeing, which renders it problematic to regard honeybees as ‘dominated’ or ‘exploited’.

From domination to trust

For all the strengths of a critical animal studies approach, then, understanding honeybee apiculture by means of a critical analysis of the exploitative human–animal relations constitutive of the category of ‘livestock’, means that many of the distinctive characteristics of bees and beekeeping are brushed aside or left unacknowledged for the sake of critical consistency. Posthumanism provides an important corrective, by insisting that we think through the lived specificities of beekeeping practices and the nuances of human–apian relations in their irreducible materiality. This, in turn, makes it possible to grasp apiculture non-anthropocentrically as a hybrid human–non-human assemblage, and to explore the ways in which beekeeping practices and discourses, as well as the mode of existence of bees, may engender ways of knowing and being that confound the nature/culture and human/non-human binaries that underpin both the conceptual architecture of ‘domestication’ and its ‘critical’ critique.

In an influential essay, Tim Ingold presents an ‘indigenous’ account of domestication in which, rather than a narrative centring on the passage of animals from an original state of wildness, defined by a lack of human control, to a state of domestication, defined by the imposition of human control, instead the central transition is from human–animal relations based on trust to relations based on domination (1994, 18). Relations of trust are here defined as a state in which something is freely given to another in the hope that it will be reciprocated, but with no certainty that it will be, and without any element of compulsion (Ingold

1994, 16). An important implication is that the other party retains genuine agency in the relationship, since they may reciprocate, but are not forced to do so. Ingold argues that this characterises the relations between hunter-gatherers and the animals they hunt, since their belief is that by treating the hunted animals with respect, eschewing cruelty and unnecessary infliction of pain, and avoiding wasting the animal once killed, the hunter maintains good relations with the species in question. This is essential to ensure that future hunts have a fair chance of success because the animals are believed to have the power either to present themselves to the hunter, thus enabling him to eat, or to refuse to appear, so that the hunter will go hungry (Ingold 1994, 13, 14). In this way the animals are granted significant – even decisive – agency in the relationship, at least in terms of the hunters’ definition of the situation. Ingold contrasts this with the human–animal relations that predominate in farming where, however affectionately the farmer may think of the animals, and however well they may be treated, they are understood as essentially subservient and dependant; they are not believed to have the power to significantly affect the farmer’s fortunes, or to withhold what the farmer wants from them. Farm animals are regarded as being under almost complete human control, and as lacking agency; hence no trust is required on the part of the farmer, since this is essentially a relationship of domination (Ingold 1994, 17).

Reflecting on this, it is striking just how significant a role is played by trust in beekeeping. By making exhaustive preparations and taking all of the right precautions, the beekeeper hopes that his or her bees will be more likely to thrive, to produce abundant honey and to survive the winter; but there is no certainty of this, and even the most experienced beekeepers will have encountered disappointment or disaster, usually more than once, and sometimes inexplicably. The complexity of honeybees, their colonies and their finely calibrated interrelationship with the local environment, means that there are always many contingencies in play, rendering notions of complete control alien to beekeeping. As one practising beekeeper puts it, ‘[t]he bees know what they are doing: our job is to listen to them and provide the optimum conditions for their well-being’ (Chandler 2009, 36). In this sense, beekeepers are more like Ingold’s hunter-gatherers than his farmers; they do what they can, observe the correct rituals, and hope that their diligence will be repaid; but

they do not have or seek the power to ensure that the desired outcome is achieved, or to force bees to produce honey, and they will not speak of their activities in these terms. Beekeepers tend to have an acute awareness that they are dealing with living and dynamic complexity and must remain open to contingency, and they will not deny the agency of the bees in the enterprise. As is evident, for example, in this particularly articulate but not untypical reflection on an early formative experience of beekeeping:

standing there in my beekeeper's suit, lording it over the hives, I could say I was assuming a stance that ignored the clear rules of the bees' nature. It didn't feel like arrogance in the moment. I suppose hubris rarely does. But certainly I was overestimating my own competence and abilities . . . I had an *idea* of myself as a beekeeper and was acting accordingly. I was getting stung and bees were dying because my idea of myself as a beekeeper was getting in the way of seeing what was really going on. (Magill 2010, 10)

Pursuing a parallel posthumanist thread, Donna Haraway's ontology of 'companion species' foregrounds 'co-constitution, finitude, impurity and complexity' (2003, 302). In this multispecies vision, it is not just that non-humans and humans 'possess' agency, but that agency itself is conceived as relational and distributed, something perpetually emergent from heterogeneous 'actor-networks' – to borrow Bruno Latour's term (1993; 2005) – rather than somehow preceding them. Thus 'none of the actors precede, finished, their interaction. They more than change each other; they co-constitute each other, at least partly' (Haraway 2003, 307); companion species are constitutively and materially entangled and entwined together within the forever unfolding biosocial web of life. There is no getting outside of this, and the human subject, far from being transcendent over nature, is relationally co-constituted vis-à-vis non-humans in an ongoing process of material-semiotic becoming. Haraway's examples are drawn from 'dog worlds' and the intricately entangled histories of human-canine co-evolution, but this ontology could well have been dreamt up by a meditating beekeeper, so uncannily do honeybees fit the companion species mould. In these terms, it is not a question of the relations between separate sovereign

entities, ‘humans’ and ‘bees’, but of the iterative enactment of human–bee hybrids, the simian–apian assemblages that have proliferated since *Homo sapiens* first came into contact with *Apis mellifera*, tasted its honey, felt its sting, observed its indefatigable activity, and began to imagine the possibilities.

Entangled politics in the Anthropocene

Returning to CCD and the crisis of apiculture, a posthumanist politics might proceed by engaging closely with the lived human–apian entanglements that constitute beekeeping, tracing the many symmetrical and heterogeneous elements of this deeply historical and hybrid practice. Instead of treating beekeepers as little more than intensive livestock farmers, they might be regarded as interspecies practitioners, sensorially and materially engaged in a liminal world interceding between the purified categories of ‘nature’ and ‘culture’. Beekeeping becomes not just an unsustainable and exploitative practice per se, but a contested terrain, subject to rationalising forces without question, but also potentially replete with relations of trust, forms of decentred interspecies encounter, and moments of affective connection with vital materiality, non-human being, and more-than-human value. Thus the task of a posthumanist critique is to relentlessly excavate and to foreground the cosmopolitics of ‘living with’ others that are incipient within apicultural practices, and to advocate for forms of practice and organisation that nurture these entangled ways of knowing and being. Rather than beginning by asking what is wrong here; what is unacceptable; and what must stop; the key questions become what is good here; what is of value; and how can this be developed. In this way, understanding the world of beekeeping as a hybrid multispecies assemblage can underpin a more nuanced and constructive politics of beekeeping.

In terms of concrete political positions there may well be significant overlap with the substantive politics of critical animal studies, and there is nothing to be gained by artificially magnifying the differences. To an extent the two approaches may be taken to refer to different objects, and insofar as this is so they may not be in direct conflict and could even be rendered complementary. For example, one might

suggest that while a posthumanist understanding of small-scale or amateur beekeeping is apt, this breaks down somewhat when considering very large-scale apiculture and commercial pollination operations, with their ecologically unsustainable monocultures, economies of scale and intensive profit-driven practices. Conversely it could be argued that while the critical-structural approach is highly persuasive as an analysis of big commercial pollination enterprises, it is stretching credulity to try to apply this sort of structural critique to small-scale or hobby beekeepers. Such a pragmatic position is perhaps preferable to a rigid theoretical purism that would insist on the universal applicability of any single way of thinking about the world. But it would surely be a mistake to conclude that posthumanist analysis can therefore safely be applied to more 'acceptable' human-animal practices while more troubling human-animal relations must be reserved for the critical animal studies treatment. Such out-and-out pragmatism would not only still mean glossing over the specificities of honeybees, apiculture and human-apian relations in order to assimilate large-scale beekeeping to a critical-ethical framework developed with reference to intensively farmed mammals, it would also elide the real differences between these ontologies and their performative politics of the 'human'.

Crucially, a genuinely posthumanist politics is never just about seeking to transform human relations with non-human animals, however important this may be; it is always also about seeking ways to simultaneously transform our most fundamental relations with ourselves as human, changing how we see and experience ourselves and our relationship with the world – our mode of existence, our very way of being human. It is a vision fuelled by humility as much as ethical conviction, and by a sense of modesty about humanity, rather than righteousness; this will tend to lead to a different kind of interspecies engagement and a different sort of politics – at times messier, more tentative, more willing to trust perhaps, and more tolerant of apparent contradiction. As an explorative sensibility orientated towards an entangled collective future that is always unfolding and yet to be fully understood, posthumanism can certainly be exuberant, but it will not presume to have all the answers already worked out, grounded in ethical universals, and just waiting to be implemented by an overriding human agency.

What can be learnt from this about the implications for human–animal studies of the paradoxical posthumanism embedded in the concept of the Anthropocene, and how to respond to it? The Anthropocene and the predicament it names poses more sharply than ever the dilemma now facing humanity in a time of unprecedented ecological crisis. In underlining the profound impact of human activity on the planetary biosphere and the geosphere itself, the Anthropocene should drive the final nail into the coffin of humanist notions of human autonomy and separation from nature. In the Anthropocene humans are finally unmasked as earthlings, as *Homo sapiens*, far from the transcendent beings of the techno-humanist imagination, unbound by material constraints; this dethroning of the human subject is consistent with a posthumanist sensibility. It is double-edged, however, because insofar as the Anthropocene is intended or is interpreted as a didactic concept and not simply a descriptive one, it powerfully reaffirms human agency and human responsibility by implying that we must take control of the planetary consequences of our species' activity in order to shape our own fate; a deeply humanist sentiment. In this respect the Anthropocene discourse contradicts itself: pointing to the organic interconnection of humanity and the natural world, as evidenced by our impact upon the Earth and the coming consequences of this for human society; while demanding that we rise above nature by taking control of our collective species activity and consciously modifying it, in what would be the ultimate demonstration of humanist transcendence and self-mastery.

As first this appears intractable but, as this discussion has aimed to show, tracing the same paradox into the tension between posthumanist and critical approaches in human–animal studies allows the problem to be approached somewhat differently. Thus, applied to CCD the Anthropocene underlines the unsustainability of current levels and forms of human productive activity, specifically industrial commercial apiculture, and its severe detrimental impact upon natural systems. It also emphasises human dependence upon these natural systems, and predicts the eventual negative, possibly catastrophic, consequences for human beings of their breakdown. Indeed CCD is exactly the sort of crisis that we should anticipate facing with increasing frequency if we are living in the Anthropocene. When it comes to the question of

what is to be done though, things are a little more complicated. The critical reading of the Anthropocene would stress the need for large-scale structural change in apiculture, amounting to either the abolition or significant diminution of commercial pollination and honey production. But a posthumanist reading would suggest that this is not consistent with a proper understanding of the situation the Anthropocene diagnoses.

By stressing the profound interdependence of humanity and the natural world, now realised on a geospheric level, the Anthropocene effectively acknowledges that humanity and nature are so inextricably intertwined that any attempt to move forward by re-establishing a more ethical separation and properly regulated interaction between the two domains is surely misconceived; there are no such separate domains. Paralleling this, the 'critical' politics of human responsibility and transformation cannot adequately address the problems of hybrid socio-natures in which agency is distributed between multiple heterogeneous actants and responsibility is at best partial and fragmentary. The humanist dream of human sovereignty, transcendence and self-knowing was always part of the anthropocentric mode of existence that impelled the ecological crisis at the heart of the Anthropocene; this crisis will not be solved by urging that the same humanist dream be realised at a still higher level. Hence a consistently posthumanist politics cannot be framed as a call for social-ecological transformation tantamount to a transcendent act of human responsibility at a species level; instead it must try to develop a more explorative, local and entangled politics of finding more humble ways to live together with others in the hybrid and finite colony we share.

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