Rollins College
Rollins Scholarship Online

Master of Liberal Studies Theses

Spring 2019

Confronting Western Conceptions of Non-Human Animal Cognition

Jinji Donato
jdonato@rollins.edu

Follow this and additional works at: https://scholarship.rollins.edu/mls

Part of the Arts and Humanities Commons

Recommended Citation
Donato, Jinji, "Confronting Western Conceptions of Non-Human Animal Cognition" (2019). *Master of Liberal Studies Theses*. 89.
https://scholarship.rollins.edu/mls/89

This Open Access is brought to you for free and open access by Rollins Scholarship Online. It has been accepted for inclusion in Master of Liberal Studies Theses by an authorized administrator of Rollins Scholarship Online. For more information, please contact rwalton@rollins.edu.

Confronting Western Conceptions of Non-Human Animal Cognition

A Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Liberal Studies

by

Jinji Donato

May 2019

Mentor: Dr. Ryan Musgrave
Reader: Dr. J. Thomas Cook

Rollins College
Hamilton Holt School
Master of Liberal Studies Program *Winter Park, Florida*

Table of Contents

Introduction

Western literature is dappled with dialogue about animals. Since antiquity, philosophical texts have predominantly positioned animals as inferior to humans in most capacities. While the Western view of animals is by no means homogenous, philosophically speaking, a consensus that non-human animals lacked cognition, more specifically, a rational faculty, formed early on. Relatively few philosophers from the ancient world suggested non-human animals could experience more than pain and pleasure (Porphyry loc. 1696). Over the course of a longstanding cultural dialogue over animal capability, the Aristotelian view of humans as the only rational species, and consequently more valuable species in a hierarchy of being, seems to have prevailed (Nicomachean 14). In the modern era, Descartes' mechanistic view and dualism, articulated in *Discourse on Method*, further demoted animals to a lowly status of mere automata (47). Historically, features of animal sentience, not rationality, have been the subject of debate regarding animal capability. The scientific community worked to settle this cultural debate in 2012 by concluding in the Cambridge Declaration of Animal Consciousness that "Convergent evidence indicates that non-human animals have the neuroanatomical, neurochemical, and neurophysiological substrates of conscious states along with the capacity to exhibit intentional behaviors" (Low "Cambridge.."). Despite formal scientific consensus on the matter of sentience, the popular and political perception of animals as beings with consciousness remains tenuous. A most recent case illustrating the popular and political vacillation on the status of animal sentience was the United Kingdom's vote against retaining explicit language about animal sentience in post-Brexit law (Ares). In the context of EU law, the term animal is understood to mean

vertebrates and upon exception, some invertebrates. With the passage of the EU Withdrawal Act of 2018, animal sentience is no longer recognized in UK law. Despite promises to legislate on the language of sentience before leaving the EU, parliamentarians have yet to come to an agreement. Intransigence on this issue stems in part from concerns voiced by members of The Environment, Food and Rural Affairs Committee. Committee members have claimed the ambiguity of the term sentience would have a litigious impact on the government (EFRA 10). The issues surrounding animal sentience in the context of Brexit provide one example of how the way animals are conceived of, described and defined can impact treatment and welfare. The apparent dissonance between the scientific community, public opinion and public policy led me to contemplate the Western conception of animal minds and question what traces of this conception might be found in contemporary practices such as animal agriculture and its role in the problem of climate change.

Disciplines in Dialogue

A handful of scholarly disciplines, interdisciplinary in nature, have emerged to formally study and elucidate human and animal interactions and their implications. These disciplines include anthrozoology, animal studies, vegetarian ecofeminism, critical animal studies and cognitive ethology. Research from these disciplines is conducted with an interest in exploring the hypothesized links between conceptions, opinions and beliefs about animal minds, levels of empathy toward animals and attitudes regarding the usage of animals. Specifically, a belief in animal mind (BAM) or the attribution of mental capacities to animals is correlated with greater empathy in the absence of utility (Hills).

Research into conceptions of animal cognition is sometimes referred to as theory of animal mind (TAM) (Spence). In the West, conceptions, opinions and beliefs are constituted and fortified, I argue in part, by the dominant intellectual tradition. My work will aim to explore a possible linkage between an historical way of thinking of animals as lesser-than to one particular outcome of climate change, using an interdisciplinary approach. Although there are many factors which have influenced the emergence and perpetuation of the livestock sector, I contend that an examination of and reconciliation with the conventional understandings of animal minds may be key to addressing animal agriculture which is one of many contributors to the climate crisis.

Despite the continual flux in legal status and public opinion regarding animals and their capabilities, philosophers and animal scientists of the 20th and 21st centuries have built a body of support for the claim that animals empirically demonstrate sentience, meaning the capacity to feel and experience mental states or more generally put, many animals exhibit consciousness (Low "Cambridge.."). However, what remains for the most part taboo to consider is the possibility that non-human animals can participate in, to some extent, the Aristotelian notion of rationality or the capability for deliberation as identified in *Historia Animalum* and more fully elaborated upon in *Nicomachean Ethics* (location 234; pg 41). Deliberation, according to Aristotle, is applied to "the things that are brought about by our own efforts, but not always in the same way" (Ethics 41). In this view, deliberation is a process by which the means to an end are chosen (Ethics 41). One might call this capacity intentionality, executive control or the workings of a rational faculty. One might also imagine how the recognition and confirmation of such cognitive abilities might complicate the human animal-relationship and pose problems for certain

industries wholly reliant upon animal labor. Whereas animal consciousness or sentience has been established by the scientific community and has been a centerpiece of ethical arguments for animal rights and welfare, animal cognition remains an active area of scholarship that is, in some cases, coming to convention challenging conclusions about the mental lives of animals.

In the discipline of philosophy, rationality is most generally described as either theoretical or practical (Sosis and Bishop 27). For the purposes of this work, practical rationality will be considered when speaking of non-human animal capability. In recent years, animal cognition researchers and philosophers have argued that some animals demonstrate a capacity for practical rationality (Blaisdell; Buckner). Such a finding reliably invites the critique of anthropomorphism or the potentially inaccurate assignment of human qualities to animals. In response, others have criticized past models of rationality and experimental trends as anthropocentric and thus scientifically inaccurate. In light of this tension, I will note here that methodological concerns regarding the interpretation of animal behavior remain and complicate the task of studying the thinking processes of other beings. Additionally, ethical concerns relating to whether attempts to study and describe animal minds violate a basic principle of informed consent remain (Menache). In light of these concerns, some researchers have interpreted empirical studies from the field of animal cognition in ways that challenge the historical conception of animal minds and take issue with the historical presupposition of animals as mindless automatons.

Taking these studies into account, my aim here is to consider how the historical denial of cognition, particularly a rational faculty to non-human animals was and

continues to be essential to the construction of a relationship between humans and animals in which animals are located below humans on a hierarchy of value and also defined in oppositional and exclusive relation to humans. Maintaining a conception of animal minds as "lesser-than" based on their capacity or lack thereof for rationality, I contend, constitutes a logic of domination that promotes unhealthy relationships with other animals and may contribute, via the livestock sector, to climate change.

The Role of Rationality

Philosophers and scientists over the past few decades have begun to interrogate the notion of rationality as the defining human feature by skeptically interrogating the presumption that humans are as rational as previously believed and alone in this regard as the cognitive capacities of non-human animals are increasingly considered (Stanovich 2019). Examining the traditional view of animal minds through an ecological feminist lens and in light of recent developments in animal studies, the inadequacy and harm in using rationality as a qualification for humane treatment emerges. The status of animal sentience has long served as justification for animal welfare legislation. Being that the capacity for suffering is the cornerstone of animal protection law, there is reason to draw a connection between the capacities humans assign to animals and how protected they are under the law. Despite the use of sentience as the basis for legal protection, billions of animals continue to be slaughtered annually for food in the U.S alone. While the knowledge that animals feel and suffer has had some impact on animal welfare (up until the point of slaughter), it has not had much of an impact on the growth of the livestock sector. Since the 1960s, "Beef production has more than doubled, while over the same time chicken meat production has increased by a factor of nearly 10, made up of

increases in both number of animals and productivity" (Thornton 2854). In thinking about why this might be, BAM seems be important. Considering that, in the West, a great deal of value is attributed to the rational faculty, the wholesale denial of our "special" kind of cognition to animals may bolster presuppositions which make it difficult for humans to empathize with and see value in non-human animals. While animal rationality is not and should not be a de jure criterion for respecting the lives of other beings, de facto there is reason to think its denial might contribute to a mindset which puts animals in the category of edible and humans in the category of non-edible. I aim to assert here that learning about animal cognition, not as a prerequisite for treating other animals with sovereignty over their bodies, but rather as a vehicle for reconciling a distorted conception of animals will strengthen empathic abilities in a way that helps to avoid what Gruen has identified as two polarities of empathetic suppression and epistemically inaccurate and inappropriate forms of empathy (*Entangled* 80). One might wonder why focus on animal rationality if it ought to be ultimately irrelevant to the way animals are treated. My answer to this is fourfold. 1) Learning that some other animals have capacities traditionally denied to them serves to emphasize the ambiguity of the distinction/demarcation between humans and animals. 2) The study of animal cognition and animal rationality in particular is relatively new, dynamic terrain that contests a long history of thinking about animals in a hierarchical and inferior manner. 3) The notion of humans as the "rational animal" in an Aristotelian sense, is undermined by this analysis. 4) Given the implications for BAM on human animal interactions, it seems a worthwhile pursuit to clarify the capabilities of animal minds.

An Interdisciplinary Project

The interdisciplinary and intersectional field of animal studies connects seemingly disparate disciplines with its focus on the historical and contemporary nature of human-animal relations. Animal studies scholars are interested in exploring questions of importance raised by examining the role other animals play in our lives and the way, as Donna Haraway says, all conscious beings, wittingly or not, interact in a "knot of species co-shaping one another in layers of reciprocating complexity all the way down"(4). Within this field, the interconnectivity of living things as part of a larger ecosystem is presumed.

In speaking about animals as if they constitute one broad category, I will commit the Derridean error of overgeneralization which arguably contributes to a dualistic mentality. As Derrida sharply put it:

> to say "animal" and then put them all into one category, both the monkey and the ant is a very violent gesture. To put all living things that aren't human into one category, is first of all, a stupid gesture-theoretically ridiculous-and partakes in the very real violence that humans exercise towards animals. (Hiperf428)

Despite my philosophical agreement with Derrida, for the purposes of readability, I will rarely honor his critique. However, when speaking of animals in general, I will instead use the term non-human animals when appropriate to bring attention to the fact that humans are also animals.

In my first section, I will outline the conceptual tools borrowed from ecofeminism that will be utilized to analyze influential works from the Western tradition. In the second

section, I provide an overview of the traditional Western conception through a textual analysis of philosophical works. In the third section, I will look at the findings from contemporary research within animal cognition looking at rationality and its analogues such as theory of mind specifically. In the fourth and final section I will suggest that the Western view of animal minds as "non-rational" serves to prop up the livestock sector. In the West where GHG emissions, consumer choice and economic power are greater, a plant-based and or aspirationally vegan diet will be proposed as a praxis for practicing healthier interactions with animals and the biosphere. It is my view that because veganism disincentivizes the expansion of animal agriculture, its more widespread practice has the potential to both aide in reconstructing relationships between human and non-human animals in non-hierarchical, non-dualistic ways and combat climate change.

From an ecofeminist perspective, I will aim to trace and describe the conception of non-human animal minds through the ancient and modern historical periods. I will argue a dominant strain of thought in the Western canon has conceived of non-human animals as hierarchically inferior and "non-rational." In light of animal cognition research, this view is found to be unscientific in many cases. Furthermore, this conception perpetuates a morally problematic human/animal dualism that devalues and discards non-human lives at the expense of our biosphere.

In the interest of establishing the devaluation of animal minds as a historical and contemporary dominant Western view, I will 1) engage with ancient and modern philosophical texts, drawing on the works of Plato, Aristotle, Descartes, Hobbes, Pope and Darwin. 2) Discuss the presence and influence of this view within the field of animal cognition, specifically its influence on the debate over ToM and how the influence of this

conception has informed critiques of anthropocentrism levied by philosophers Kristen Andrews and Cameron Buckner. In order to lend support to my claim that the presence of a logic of domination encourages destructive relationships between human and non-human animals, I will reference psychological research into the belief in animal minds (BAM) which posits a linkage between conceptions of non-human animal minds and the nature of relationships with other animals in section one.

To support the notion that a historical conception of animal cognition as hyper-separate from and inferior to human cognition constitutes a logic of domination, I will apply the ecological feminist constructs of value hierarchy and value dualism to the aforementioned ancient and modern thinkers in section two and to the debate over ToM in section three. In section four, I will support my claim that the livestock sector, as one of the most significant contributors to climate change, is a representative manifestation of this historical conception of animal minds as lesser than by analyzing data from FAO and IPCC's Global Warming of 1.5ºC report through the lens of ecofeminism. Based on my research, I will recommend a shift to a plant based, aspirationally vegan diet as ecological feminist praxis in the reconstruction of a healthier relationship with other animals and the biosphere.

Section 1

Ecofeminism as Theoretical Approach

> Much of the problem (both for women and nature) lies in rationalist or rationalist-derived conceptions of self and of what is essential and valuable in the human makeup. It is in the name of such a reason that these other things- The feminine, the emotional, the merely bodily, or the merely animal and the natural world itself - have most often been denied their virtue and been accorded an inferior and merely instrumental position.
>
> — *Val Plumwood, Feminism and the Mastery of Nature*

Ecological feminism is rich in conceptual resources which, when applied to issues in animal studies, work to clarify and contextualize the conventional wisdom of Western philosophy and science. Ecofeminists labor to reveal the connections between the oppressions of women and nature through various constructs. The breadth and depth of ecofeminist thought is expansive and by no means monolithic. Scholars in this field have developed a plurality of perspectives from which to examine literature, media, language, ethical systems etc. While I will draw from critical perspectives within ecofeminist literature throughout this work, special indebtedness is owed to the critique of the rationalist tradition, articulated by Val Plumwood. Additionally, the theoretical constructs of value-hierarchical thinking, oppositional value dualism and a logic of colonization/domination, as developed by Val Plumwood, Vandana Shiva and Karen Warren will be instrumental to the textual analysis in section two. I will utilize these concepts to emphasize how animals have been relegated to a lower rung of the existential ladder and argue that the nature/culture dualism found in classic Western texts maintains

this subjugation through the use of a logic of domination to justify oppressive stratification between humans and non-human animals. Additionally, Lori Gruen's entangled empathy model will be relied on as a care-based ethic to argue for a move away from the cultural value of rationality as a defining feature of humanity.

I am interested in carrying out a critique of the Western literature and particularly examining the concept of *scale naturae* which has firmly situated animal lives on the hierarchical framework as at best "non-rational" and at worst mechanical. I agree in this work with Plumwood that "Rationalism is the key to the connected oppressions of women and nature in the West" and increasingly think ecofeminist analysis coupled with animal cognition research and the looming threat of climate change offers a formidable challenge to the human/nature dualism. My analysis will stem from Plumwood's assessment with a focus on non-human animals. Looking at historical notions of rationality, the Western view of non-human animals will be examined to better understand the conceptual mechanisms which have enabled the large-scale exploitation of other animals.

Across the ages, a dominant strand in Western literature has encouraged a kind of hierarchical thinking that has led to a permissive attitude towards animal domination. Hierarchies are not inherently oppressive, rather, it is distinctive qualities that lead a hierarchy to become oppressive. Hierarchies can be useful for organizing information or preventing harm such as in the case of a teacher exercising control over her classroom (Warren 256). Hierarchies take on an oppressive characteristic when the logic of domination is then applied to the disjunctive relationship. A distinction is drawn in ecofeminist literature and in this work between oppressive hierarchies and other kinds

which serve a protective rather than subordinating purpose. Early traces of value hierarchical thinking are found in Plato's *Phaedrus* and Aristotle's *Historia Animalium*. Plato's ranking of human souls as in the *Phaedrus* is a formative example of the tendency to rank life. In this work, Plato constructs the allegory of the chariot which delineates the various rankings of human beings depending on the degree of their fall. Value-hierarchical thinking can also be found by examining *Historia Animālium* in which Aristotle describes a version of the great chain of being (*scala naturae*). To use a term coined by Ariel Salleh, this type of thinking is still in "the capitalist unconscious." According to Salleh, the hegemonic unconscious is "this kind of hierarchization where power belongs at the top and is exercised down. Everything below the line, in the sphere of nature is treated as a resource. That's the underbelly of everyday assumptions we are trying to change" (Risaliti). In section two, I will focus my analysis on works that promote oppressive value hierarchies. Critiquing a rationalist culture also requires us to look for the presence of oppositional value dualisms.

An oppressive conceptual framework promotes oppositional value dualisms or binaries which place value on one end and deny value on the other. Some of the oppositional value dualisms I will be interested in exploring in this work are, human/animal, culture/nature, rational/non-rational. Particular attention will be paid to the rational/non-rational dualism in light of developments within animal behavioral science. An understanding of how the rational/non-rational disjunction was constituted will be sought through an analysis of Aristotle's idea that human beings solely have a rational principle or the ability to carry out rationally formulated projects as articulated in his *Nicomachean Ethics*. Ecofeminism provides a methodological approach for

deconstructing dualisms by focusing on the following guidelines. As Plumwood detailed in *Feminism and the Mastery of Nature*, the concept of dualism is constituted by many factors such as backgrounding, instrumentalizing, denial of dependency, and radical exclusion among others (Plumwood 2015). Part of confronting the Western literature is recognizing that non-human animals are backgrounded. Ancient thinkers tended to appreciate other animals without fully acknowledging the dynamic as a relationship. Ecofeminism can help us reflect on our tortured relationship with other members of the ecosystem, reassess and move forward in our relationships with other creatures. In the face of an anthropogenic climate crisis in significant part fueled by greenhouse gas emissions from the livestock sector, examining these relationships will be critical. Paying attention to how non-human animals are conceptually regarded has implications for humans and non-humans alike.

Embracing an Alternative Ethic

An ethic that will guide this work is derived from Gruen's entangled empathy model of interacting with other beings. Gruen's ethic is aligned with a non-hierarchical concept of difference and will illuminate, when applied to the problem of animal agriculture, diet and climate change, one route forward. Operating on the premise that humans already are in relationships with other animals, Gruen circumvents narrow 'us versus them' narratives perpetuated by the classical binaries (humans versus non-humans) (rational versus non-rational). Gruen identifies the human dynamic with other animals as a relationship as opposed to a transaction or burden or some other dispassionate exchange and in doing so, makes room for reflection and examination. In describing the human/non-human animal dynamic as a relationship, Gruen challenges her

reader to question the quality of these relationships. Furthermore, Gruen, shifts responsibility away from laypersons to those with the most expertise and/or familiarity with the harmed party (non-human animals). Gruen adopts a social justice framework and vocabulary to understand those we are in relationships with that we do not fully understand or that we may have difficulty empathizing with noting "When certain features of a situation are taken as given, when the background conditions that led to the moral problem are overlooked, certain potential solutions are overlooked" (9). I agree here with Gruen and argue one of the features of the current non-human animal situation is the presumption that animals are hierarchically different and included in that assessment is the charge of being nonrational. This belief that all non-human animals lack a rational faculty stems from a long line of thought that has promoted rationality as an exclusive feature of humanity. Paying attention to this particular feature of rationality may make way for possible solutions that were not available to what Gruen refers to as the "moral imagination" (Entangled 10). The current logic regarding non-human animals as I see it is as follows: If humans are the only rational creatures and it is okay to mistreat or harm any creature that does not think precisely like a human, then one should not be surprised to find there is a general lack of recognition of interconnectivity or entanglement. The reconsideration of what it means to be a rational animal may allow for the kind of empathetic surge Gruen advocates for. This work will be in line with the entangled empathy model proposed by Gruen that says learning more about capabilities not only undermines the traditional view of animals as hierarchically less than and categorically separate from human, it also can facilitate our empathetic instinct when studies are conducted in an ethical manner.

Belief in Animal Mind (BAM)

The notion that learning about animal capabilities and cognition in particular can impact empathy is not just theoretical. A research area has emerged to study the psychology behind human relationships with other animals. Belief in Animal Mind (BAM) is a subfield of psychology that aims to explore the relationship between what humans report they think about the cognitive abilities of other animals and the usage and status of those animals in society. The studies conducted in this area have generated interesting data pertaining to the relationships between people and animals. Researchers have noted the discrepancy between public perception and scientific understandings of animal capabilities (Spence; Maust-Mohl). It has also been noted in the literature that in order to resolve the dissonance between empathetic inclination toward animals and meat eating, a phenomenon known as the "meat paradox," the mental capacities of animals used for food purposes are frequently devalued (Bastian). In consideration of research on human perceptions of animal mind, this work will reflect on the potential for BAM to have implications for animal welfare and beyond.

Avoiding Uncritical Equality

According to Gruen, one problem for traditional ethical theories such as those of Regan and Singer is their emphasis on doing away with morally significant difference. In agreement with Gruen and other ecofeminists, there is a danger in focusing on sameness. However, in my view, the Western tradition overemphasizes distinction and difference and when inappropriate, these distortions must be addressed. My interest in describing the shared qualities of rationality between humans and some non-human animals is not to reinforce sameness but rather to reconstruct a conception of rationality to account for

similarities and differences as they arise. In doing this, humans may learn some things that change the nature of relationships with non-human animals from backgrounded passive supporting characters who only serve to bolster the human narrative to beings with agency and cognition. With my theoretical posture outlined, I turn to look at the various ways the Western conception of animal minds and classical model of rationality as an exclusive feature of humanity is dualistic, hierarchical and contributes to the construction of a logic of domination.

Section 2

Sketching the Western Conception of Animals

Rationality has perennially been held as the exclusive and defining feature of humanity. While a consensus that rationality alone can distinguish "man from beast" exists amongst many of the most influential Western philosophers, not all have defined rationality in the same terms. Despite the plurality of descriptions for what constitutes rationality, ancient and modern philosophical thinkers have consistently made one thing clear, non-human animals do not have it. In reviewing texts which refer to animal-kind spanning the transition from Aristotle to Darwin, a general view of animals as cognitively inferior was constructed and maintained. Through an exposition of excerpts pertaining to animals and their capacity for rationality, I will aim to sketch the dominant Western view through the ancient and modern periods.

Classical Conceptions

Due to the abundant use of animals as metaphorical and allegorical tools in ancient texts, one might assume non-human animals to be held in high regard. Animals have served not only as literal but also figurative beasts of burden, bearing at different times the most revered and reviled traits projected onto them by human kind. The ancient Western dialogue about humans and animals is characterized by a literary codependency with animals often serving as devices for the articulation of some slippery quality in human nature. Some passages leave the impression that animals are genuinely admired for displaying virtuous qualities. In other selections, animals serve as vessels for less than ideal qualities. For an animal to be praised here and there for some capability deemed important or valuable in the works of Plato and Aristotle belies how animals were

regarded overall in their writings as fundamentally inferior. Putting passing commendations into a larger context, animals often serve an instrumental rather than agentic purpose. While Plato and Aristotle are quick to point out the many qualities animals appear to demonstrate in great resemblance to humans, there is a clear line drawn when discussion turns to reason and rationality or *logos* in the Greek. It is on this subject of *logos* that a hierarchy and duality between rational/non-rational begins to form. This early denial of reason to animals is a part of a larger project of defining by contrast the human condition to the point of an irreducible primary. The ability to reason or possession of a rational faculty was expressed through Plato's dialogues and by Aristotle as that which sets man apart. Consequently, rationality or the capacity to reason became imbued with a weight of import that continued to accumulate over time, giving advantage to the only species thought to display it, namely human beings. Traces of a cognitive hierarchy can be read in the earliest Platonic and Aristotelian writings and are reiterated through the pages of the great books with rare exception. This value is detected in Plato's description of the tripartite soul and in Aristotle's discussion of soul in *De Anima*. Plato's comments about animal cognition in his *Republic* and *Phaedrus* provide formative examples of a tendency to rank beings. A view of animals as hierarchically inferior, instrumental, and ultimately lacking the ability to reason will be established through a review of Plato's *Republic* and *Phaedrus* and Aristotle's *Historia Animalum* and *De Anima*.

Through a discussion about animal enslavement, a hierarchy is established along with a culture/nature dualism in Plato's seminal work, the *Republic*. The notion that animal enslavement necessarily preserves democracy is asserted. In this dialogue,

Socrates makes a parallel between the tripartite soul and the class system. Within this system, the guardians are associated with being reasonable, the middle class or auxiliaries spirited and the lower classes, appetitive. Through Socratic dialogue, an ideally balanced society is described. In part two, chapter three, Socrates and Glaucon discuss the qualities that guardians should possess. They agree that Guardians should have a "philosophic disposition" (loc. 1817). To illustrate this point, an animal is used to metaphorically represent character traits thought be rare in humans but common in animals. Socrates makes the general observation that "there are natures which combine the qualities we thought incompatible" and they are to be "found in different kinds of animal" (loc.1798). Identifying the watch-dog as a vessel for the qualities formerly thought to be mutually exclusive (spirited and gentle) Socrates adds that a "well bred watch-dog" has the disposition of a philosopher (Republic loc. 1777). When Glaucon questions his meaning, Socrates explains how watch-dogs have the keen ability to "distinguish the sight of friend and foe simply by knowing one and not knowing the other. And a creature that distinguishes between the familiar and the unfamiliar on the grounds of knowledge or ignorance must surely be gifted with a real love of knowledge" (Republic loc 1814). While the watch-dog is praised here for exhibiting prized qualities that might indicate possession of more than a perceptual nature, this does not gain watch-dogs a higher placement on the value hierarchy. The watchdog is used here instrumentally to illustrate the master's end. In a mechanism that will be observed again, animals are recognized for certain admirable traits, traits that would qualify them to participate in a mental life beyond basic perception, yet time and again, this is done for the use of a human aim. As Plumwood describes in a chapter on the logic of colonization, the undervalued

constituent (animal) “has no such intrinsic value, is not for-itself but merely useful, a resource” and as such is beyond the moral realm (Feminism and Mastery 53).

In chapter eight of *Republic*, Socrates makes clear where animal kind ranks in his society. In beginning the dialogue, Socrates makes an analogy between oligarchy and democracy to illustrate how excess gives rise to tyranny. Socrates says that money is to oligarchy as liberty is to democracy and either in excess will lead to tyranny. An excess of liberty results in an anarchy that can infect “even domestic animals” (loc 6091). Socrates muses to his interlocutors about the dangers of a classless society, making a slippery slope argument that he should see how animals have a “grand freedom” that even “horses and donkeys” are free to roam the streets with little regard or courtesy for any human passerby in democracy (loc. 6094). In Socrates’ view, animal liberty of the kind just described is a corrupting force in a democracy. Likewise, a similar notion of animals as necessarily subjugated is presented, in a passive, but nevertheless important way in *Phaedrus*.

As part of the larger thematic conversation between Phaedrus and Socrates over the question of whether the non-lover is superior to the lover, Socrates narrates a “proof” for the notion that love is sent by the gods in the form of madness (loc. 292). Within the confines of this dialogue, Socrates articulates the Allegory of the Chariot to illustrate Plato’s theory of the tripartite soul. To illuminate “the nature of the soul” Socrates proceeds to illustrate the soul as represented by a chariot driven by two winged horses (loc. 291). The horse on the right is described as “moderate, modest and inclined to be reasonable” (loc.413). The horse on the right is also intelligent in the sense that he “is guided by words and commands” (loc 413). The animals in this metaphor serve as

vehicles for Plato's philosophy. Although the horse on the right is praised for its more desirable nature it serves merely an instrumental purpose. The regard for animals as resources rather than subjects is made clear when the horse on the left begins to disobey the chariot driver. Reason in this metaphor literally and violently forces the appetitive horse to submit, "Drawing back as if from a starting-rope, the driver rips the bit out of the teeth of the violent horse even more forcefully than before and covers its tongue and jaws with blood, forcing its haunches to the ground as punishment" (Phaedrus loc.437). In this passage, the animals represented by the two horses are subjugated while humans, represented by the chariot driver, are elevated in a value hierarchy. Not only is the notion of reason and its role as subjugator of the other capabilities indicative of the significance of reason as an assumed feature of the ruling class, it also is suggestive of a kind of justificatory and permissive attitude towards violence against those deemed to lack a rational faculty. Plato's description of metempsychosis through Phaedrus provides an early hierarchy for understanding the status of "wild animals" (loc. 352). Reading further into Phaedrus and the system of metempsychosis, one learns that a soul that has not witnessed truth (grasped by the rational faculty) cannot take the human form. In the elaborate schema of metempsychosis, souls are reincarnated according to how much truth they have seen during the procession of charioteers. Socrates during his speech explains that the laws of this system dictate that animals receive second hand souls, stating: "Any soul that is unable to follow, cannot see what is true, and has the misfortune of forgetting what is essential so that it is filled with sloth, then it grows heavy, loses its wings and sinks to earth" (loc. 339). The laws of metempsychosis further stipulate that such a soul will be planted into a human being, not into a wild animal, as its first incarnation

(Phaedrus 339). However, after one lifecycle, two groups emerge: those who have lived justly and those who have lived unjustly. The unjust are punished in the underworld and the just rise up to the heavens. After one thousand years, the just and unjust souls gather to "draw lots" and it is at this point that "a human soul may enter a wild animal, or a soul that was formerly human may again become human" (Phaedrus loc. 351). In a revealing stipulation, "a soul that has never seen the truth cannot attain human form" (352). By default, animals must receive the souls that have not seen the truth and have lived an unjust first life. Animal souls, one could infer, are doubly flawed in that they are the leftover souls of the unjust and unenlightened. Socrates critically distinguishes human reasoning in saying "to be human, one must be able to understand and articulate a form that integrates many perceptions and grasps them through the power of reason. In this way, humans recollect what our soul once beheld when it followed a god, transcend the things we now consider to exist, and saw reality itself" (Phaedrus Loc. 354). From this passage, a sense of the Platonic hierarchy, necessitating animals receive the imperfect, once briefly but inadequately human souls, is gained. Animals are, by systematic design, assigned second class souls. When Plato makes rationality a part of the soul and then makes a soul that has preserved its rational faculty mutually exclusive from animal kind, he is placing non-human animals on a lower rung of an existential hierarchy. In the aforementioned Platonic texts, one finds the idea of hierarchical thinking about animals as necessarily lacking rationality and hierarchically inferior. The visions presented by Plato informed conventional wisdom about the "natural" order of things. While both cases are early forms of hierarchical thinking, they nevertheless set a precedent for how animals will be perceived in subsequent ages.

Remarkably, Aristotle included humans in the category of animals. He also did not shy away from bestowing the quality of intelligence upon many creatures including cranes who he assessed had "high intelligence" (loc.6291). However, reason is reserved for man alone. Aristotle built upon his teacher's view of animals and rationality as mutually exclusive. Based on observations of the natural world, Aristotle identified reason or a "rational principle" as the most significant demarcation between humans and all other species. Additionally, Aristotle's descriptions and classifications of animals laid the foundation for the medieval concept of *scala naturae* or The Great Chain of Being. Although no direct textual reference is made, the concept of *scala naturae* emerges from Aristotle's categorization of life in *Historia Animālium* and a description of soul in *Nicomachean Ethics*.

In book one of *Historia Animalum* Aristotle makes several comparisons between humans and other animals. Regarding physiology, Aristotle notes that "Man is the only, or nearly the only, creature, that has eyes of diverse colours" claiming "Animals, as a rule, have eyes of one colour only" (loc. 448). In regard to character, Aristotle noted differences he considered to be exceptional to "man alone" (loc. 234). The qualities observed are significant to this discussion as they can be considered precursors or part and parcel to a rational faculty. The first quality Aristotle brings attention to is deliberation stating, "But of all animals man alone is capable of deliberation" (Historia 234). The second quality thought by Aristotle to be held by "man alone" is memory. Aristotle observes in *Historia Animalum* that "Many animals have memory, and are capable of instruction; but no other creature except man can recall the past at will" (loc. 236). As I will touch on in section three, these qualities are linked to an ability to reason

or more generally demonstrate cognitive executive control. Their denial works to establish animal cognition as lesser than and opposed to human cognition. In the *Nicomachean Ethics,* Aristotle sets out in book one in part to determine what is "peculiar to man" (13). Aristotle quickly rules out life as a distinct function of man because this, he acknowledges is "common even to the plants" (13). Aristotle moves on to perception, and once again, determines that perception is "common even to the horse, the ox, and every animal" (14). After ruling out these other possibilities, Aristotle postulates that "There remains, then, an active life of the element that has a rational principle; of this, one part has such a principle in the sense of being obedient to one, the other in the sense of possessing one and exercising thought. And, as "life of the rational element" also has two meanings, we must state that life in the sense of activity is what we mean; for this seems to be the more proper sense of the term" (14). In considering this rational principle as the function of man, Aristotle is precluding other animals from participating in it. While Aristotle brought much attention to the lives of animals, his distinction between humans and animals has had a lasting influence on the perception of animal minds as lacking a rational capability.

Modern Conceptions

In the modern period, while animals enjoyed more direct praise for their abilities, they continued to be counted as non-rational creatures. They also continued to be utilized in literature for the purpose of describing some yet undefined feature or nature. By continuing to define animals as "non-rational" creatures, modern philosopher perpetuated a hierarchical view of animals as lesser than and dualistically other. Rene Descartes described animal cognition in stark and now infamous terms in his *Discourse*. In this

work, Descartes defined reason as “the power of judging aright and of distinguishing truth from error, which is properly what is called good sense or reason” (5). Descartes noted the physical similarities between humans and animals reflecting upon his vivisections that, in regard to physiological structures, the “animals, void of reason may be said to wholly resemble us” (38). Despite this admittance of physical commonalities, a rational principle was viewed by Descartes as a function of the soul which he came to belief was “annexed” to the human body by god (38). In addition to a rational capacity being a function of the soul, Descartes viewed it as something belonging only to humans. In listing the qualities of good sense, Descartes notes three features which contribute to the “perfection of the mind” and then remarks that reason or sense alone is what “distinguishes us from the brutes” (5). Descartes asserts that language is the key reason why animals cannot be rational. He writes that non-human animals lack the ability to appropriately and meaningfully communicate their thoughts, which he claims to be a necessary quality of rational beings (46). Even when non-human animals are capable of imitating speech, such as in the case of parrots, because they cannot react to every situation in a thoughtful way, it is impossible to know they are not automata. This disturbing conclusion that animals are mere automata or “moving machines” served to devalue the lives of animals. The links Descartes makes between language and rationality and language and living systems continued to exert great influence into the 20th century. Interestingly, it is advancements in computer technology that have in part informed notions of the kind of languageless rationality that I will consider in section four. Looking at Hobbes’s view of rationality, one finds an appreciation for what animals accomplish. Hobbes reinforces the belief that due to the lack of language; animals are not

able to engage in reasoning. While the catalyst for reason has shifted away from a conversation about souls, animals are still placed in a lesser category due in part to them being deemed languageless by Hobbes. Although Hobbes' account of human nature provides a definition of rationality which is more in harmony at times with non-human than human behavior, Hobbes, in no uncertain terms, denies a rational capacity to non-human animals. Hobbes lays down his fundamental law of human nature, "a precept or general rule of reason," which is "that everyman ought to endeavor peace as farre as he has hope of attaining it, and when he cannot attain it, that he may seek and use all helps, and advantages of warre"(Hobbes 59). According to this law of rational human nature, humans should pursue war only after all efforts for peace have failed and only in the interest of self-preservation. Hobbes' second law, that rational persons should adhere to is a version of the Golden Rule, "whatsoever you require that others do to you, that you do ye to them" (59). Between these two rules, a solid foundation was built for rational action against which non-human animal behavior can be compared. The opportunity for comparison presents itself when Hobbes explains why "certain creatures without reason, or speech nevertheless live in society, without any coercive power" (80). Taking ants and bees as examples, Hobbes observes these creatures live naturally in a sociable manner and this quality can be attributed to their "non-rational". The penchant for peaceable relations found among irrational creatures, he argues, is in part the result of a lack of speech which makes them incapable of deceiving one another by representing "that which is good, in the likenesse of Evill; and Evill, in the likenesse of Good;" and "discontenting men, and troubling their peace at their pleasure" (Hobbes 81). The capacity for speech is significant to Hobbes and he links it intimately with rational

thought at the beginning of his work. However, the use of speech in this way as a tool of deception explicitly violates his stated rational laws of nature to seek peace unless one's life is in danger and to do onto others as you would have them do onto you. In this sense, the power of language is not solely aligned with rationality and its absence allows non-human animals to behave according to the dictates of natural law which are based on reason. Considering the parallels between what Hobbes claims to be rational behavior and what he observes in non-human animals, to present the two as mutually exclusive proves inconsistent within his model for rational behavior but does speak to an ingrained view of animals as necessarily different in a fundamental way. This difference, as Hobbes make clear is predicated on a lack of rationality and its related features such as curiosity and what he calls "reckoning" "(that is, adding and subtracting) of the consequences of general names agreed upon, for the marking and signifying of our thoughts" (14). Hobbes draws the distinction between humans and animals in defining curiosity as the following:

> Desire, to know why, and how, CURIOSITY; such as is in no living creature but Man; so that Man is distinguished, not onely by his Reason; but also by this singular Passion from other Animals; in whom the appetite of food, and other pleasures of Sense, by praedominance, take away the care of knowing causes; which is a Lust of the mind, that by a perseverance of delight in the continuall and indefatigable generation of Knowledge, exceedeth the short vehemence of any carnall Pleasure. (Hobbes 22)

Hobbes was one of many modern thinkers to affirm the ancient view of animals as lacking in rationality. His utilization of animals to illustrate a point about human

distinction serves to cast animals as dualistically opposed to humans, for better or for worse.

A hierarchical ordering of life is found in Alexander Pope's Poem *Essay on Man*. In Pope's view, rationality is the exclusive power of man and the product of a divinely ordered world in which all beings are in "exact proportion to the state; Nothing to add, and nothing to abate" (Essay 185). Pope, in articulating his hierarchical worldview, places human beings above animals in the "vast chain of being" due to their god given power of rationality. He predicates this rationality on the understanding of this order in saying "Shall he alone, whom rational we call, be pleased with nothing if not blessed with all" (Essay 187). The implication being, one who is not pleased with anything if not blessed with all is acting in a manner inconsistent with rationality. Pope is poking fun here at the observed tendency in human nature for hubris. As he describes, mankind wants "the strength of bulls, the fur of bears," or more than should be reasonably desired (Essay 182). Other creatures, in contrast, seem to be content in their position, "each beast, each insect, happy in its own" because pride does not interfere. Here, as in *Leviathan,* pride is a human construct which can result in maladaptive emotions such as rage according to Hobbes and Hubris according to Pope. If playing one's part, according to one's nature, is the standard for rationality, and non-human animals more readily accept their position, Pope could be interpreted as suggesting that non-human animals can be considered rational actors in a world determined by providence. However, as seen before, animals are used merely instrumentally in order to reflect some formerly obscured human quality or nature. In the context of Pope's work, that feature is hubris. Another standard of reason held by Pope in *Essay on Man,* which non-human animals seem to meet more

readily than human kind, is the respect for nature's interdependence and interconnectedness. Pope gives great credit to other creatures for their propensity to live harmoniously within the natural world. The spider for example, whose fine touch "feels at each thread and lives along the line" does so naturally without resistance or desire to play more than a small role in the grand scheme of nature (199). Man, in contrast, must be reminded that in the great chain of nature, every link serves the purpose of contributing to a holistic balance. But mankind, Pope thinks, is always questioning its interdependence on other links in "Nature's chain" (201). The cause of such folly is pride, from which Pope wrote "our very reason springs" and paradoxically "our error lies" (174, 160). While it seems at first that Pope is saying pride is a necessary condition for rationality, he clarifies that pride is the result of poor reasoning. When judging moral and natural things, "In both to reason right is to submit" (174). In the sense that submission indicates proper reasoning, non-human animals are in accordance whereas humans have gone astray. If man can act irrationally in his misguided ambition to "act and think beyond mankind" and mistreats the beings upon which he is dependent and still can be considered a wholly rational creature, non-human animals should, in all fairness be considered to possess some degree of rationality (Essay 188). Rational purity would have to be a requirement to exclude non-human animal kind from the spectrum of rationality and since it seems humans act at times in irrational ways, limiting the label of rationality to only human beings seems inconsistent. Despite Pope's recognition of virtue in animal behavior, Pope maintains the social order although arguably regards it skeptically.

In a short essay written for The Guardian newspaper, Pope makes an observation similar to the one found in *Essay on Man* about non-human animal nature as opposed to human nature. In *Against Barbarity to Animals,* Pope emphasizes the irrationality of man when compared with other creatures. From Pope's perspective, creatures which have the capacity to do great damage, generally avoid mankind and only do harm when provoked by necessity of hunger (Pope 260- 261). In this sense, non-human animals adhere to Hobbes first law of nature. Man, in stark contrast, does not act in accordance with Hobbesian natural law in that he actively "seeks out and pursues even the most inoffensive animals on purpose to persecute and destroy them" (Against 261). Despite these recognitions of seemingly rational behavior, Pope never explicitly questions the nature of animals as anything more than non-rational. Such behavior on the part of humans does not conform to God's law as expressed in *Essay on Man*. In both works, Pope does not deny the right to consume flesh but rather shines a critical light on the senseless way in which non-human animal flesh is consumed. Humans should instead, he advises, "find it hard to vindicate the destroying of anything that has life, merely out of wantonness" (261). Pope characterizes the wantonness human beings display in their treatment of non-human animals as "ignorant barbarity" (261). Some non-human animals, he laments, are unfortunately regarded as "common enemies" for "no manner of reason" (261). While Pope categorically denies other creatures' status as rational beings, his representation of non-human animal behavior suggests a greater aptitude for reasonable behavior towards living beings than their human counterparts. Despite this presentation, nature's chain remains intact throughout the modern era.

A survey of modern philosophical thought reveals rationality is determined relatively by a philosopher's values. Rationality as described in *Leviathan* consisted in adherence to natural laws. *Essay on Man* presented rational behavior as consistent with an acceptance of one's God given abilities without hubris and a respectful regard for the interdependency of all beings. Additionally, the wanton cruelty towards non-human animals as an irrational act of ignorance was condemned in "Against Barbarity to Animals." Although non-human animals are recognized as exhibiting behavior more consistent with reason than their human counterparts in certain cases, they are not considered by Hobbes or Pope to have any capacity beyond basic perception. Despite a Cartesian model that overestimates human speech as an indicator of rationality and underestimates the human capacity for inappropriate and meaningless speech and behavior, non-human animals demonstrate through their actions the ability to act in ways that conform to our understanding of reasonable behavior. However, they are not afforded participation in the realm of rationality.

In *The Descent of Man*, Charles Darwin imagined the "anthropomorphous ape," a fictional being that could reflect on and communicate the inherent cognitive limitations of his own species. Darwin imagined such a creature would take stock of lower abilities such as using "stones for fighting or for breaking open nuts" but confess the inability to "follow a train of metaphysical reasoning or solve a mathematical problem" (location 2385). Darwin's use of personification to express his own ideas about the gap between human and other animal minds is an important preface to his often quoted statement: "the difference in mind between man and the higher animals, as great as it is, is certainly one of degree and not of kind" (location 2393). With Darwin's meaning in mind, I will turn in

the next section to a discussion about the empirically studied similarities and differences between humans and animals in an effort to juxtapose the classical with the contemporary view and show how the traditional denial of animal cognition continues to influence contemporary disciplines within animals studies.

Section 3

Scientific Conceptions of Animal Minds

> In no case is an animal activity to be interpreted as the outcome of the exercise of one which stands lower in the psychological scale.
>
> — *C. Lloyd Morgan, An Introduction to Comparative Psychology*

Since ancient times, the meaning of rationality has undergone significant refinement. As the conception of mind transitioned from an immaterial substance located in the soul to a materially based emergent property of the brain, an understanding of what it means to be rational shifted. Despite this shift, the study of animal cognition continues to reflect a Western mindset characterized by a human/nature dualism. As reviewed in the previous section, much of the historical discourse surrounding rationality has taken place in binary terms. This constructed rational/non-rational binary has led to a kind of all or nothing thinking which radically excludes animals from the culturally valuable quality of rationality. As animals were studied more systematically in the early modern era, the criticism of anthropomorphism was levied. In 1894 the British zoologist and psychologist C. Lloyd Morgan published *An Introduction to Comparative Psychology* in which he wrote about the minds of non-human others and cautioned against the propensity of anecdotal and observational methods in the nascent field of comparative psychology. A narrow interpretation and iteration of the law of parsimony, his canon states that "In no case is an animal activity to be interpreted in terms of higher psychological processes if it can be fairly interpreted in terms of processes which stand lower in the scale of psychological evolution and development" (Morgan 81). Based upon the conclusions of a large segment of animal cognition researchers, comparative psychology into the present

day seems to be still guided by his precept. While Morgan's canon was intended to be a safeguard against anthropomorphism, Morgan clarified that his canon was not intended to preclude animals from higher functions stating, "the canon, by no means excludes the interpretation of a particular activity in terms of the higher processes, if we already have independent evidence of the occurrence of these higher processes in the animal under observation" (59). Within the field of comparative psychology, of which animal cognition studies is a subfield, some researchers in the recent past have been hesitant to describe animal behavior in mentalistic terms. Others have found purely associative behavioristic explanations inadequate. While the conservatism within the sciences regarding the cognitive upper limits of animal minds is not entirely inappropriate, some have argued it reflects, rather ironically, anthropocentric bias (Buckner 2013, Andrews 2005). A paradox exists within this field for if one is to interpret animal behavior in terms of human behavior one is accused of anthropomorphism but if one refuses to interpret animal behavior in terms of human standards one may be acting with an anthropocentric bias against other animals. A divide has formed between those who maintain the dualistic distinction of mentalistic/behavioristic and those who are beginning to question its usefulness and accuracy. While some researchers have embraced a more inclusive approach to understanding non-human animal minds, seeing rationality and animals not as mutually exclusive, the study of animal cognition, while advanced in many ways, continues to reflect the traditional Western view of animals as part of the "inferiorized other" through an apparent adherence to a hierarchical view articulated in Morgan's Canon and through a largely anthropocentric experimental paradigm (Plumwood 49). The rational/non-rational dualism plays out in a few subfields of animal cognition most

notably in studies of theory of mind (ToM) and executive function. The purpose of exploring the way animal minds are studied is not to deny difference but rather to reveal how a presumed difference may be distorted and the basis of a socially constructed relationship characterized by domination. Some of the findings in this area of animal cognition research undermine the traditional Western conception and raise interesting questions about what it means to maintain a view of non-human animals as necessarily non-rational creatures. In what follows, I will define ToM as it is currently understood within the scientific community, explain the development of the debate over ToM and describe how it reflects a tension created by the traditional view of animal minds as inferiorized other.

Theory of Mind as Microcosm

The investigation into the capacities of other animals has manifested into a major scientific enterprise. One inroad researchers have used to better understand the minds of other animals is to explore and test out the question of whether animals have what is called in the cognitive sciences ToM, a cognitive skill involved in "social reasoning" (Vaart 336).Theory of mind refers to the developmental point in which "children come to understand their own and others' minds" (Carlson 1). While a relatively firm concept when applied to human beings, its usefulness as a conceptual tool for assessing the capacity for "mind reading" in other animals is still a controversial one. Some researchers think chimpanzees for example are capable at most of sophisticated behavioral abstraction (Povinelli and Vonk 2003). Others think that animals have at least some of the basic capacities for ToM (Krupenye 113). In ToM studies, a divide has formed between mental and behavioral mental systems.

Long believed to be an exclusively human capacity, researchers since the late 1970s have wondered whether our great ape relatives might share the capacity for "mind reading" and whether this could be demonstrated in a laboratory setting. ToM is considered a potential capacity that emerges in neurotypical human children around the ages of four and five. Premack and Woodruff were the first researchers to apply ToM to the study of animals. In their landmark study, "Does the Chimpanzee Have a Theory of Mind," Woodruff and Premack defined ToM as an individual's ability "to impute[] mental states to himself and others" (515). These mental states might include "purpose or intention, as well as knowledge, belief, thinking, doubt, guessing, pretending, liking, and so forth" (515). While methods of testing for ToM have remained standard in humans, animal behavioral researchers have worked to devise experiments which replicate comparable human tests without a verbal component. The Sally-Anne test is a standard protocol used in developmental psychology to identify a child's capacity to understand that they have, and others may hold false beliefs (considered by some a hallmark of ToM) about the world. Although this test typically relies on dialogue between researcher and subject, variations on this experiment have been devised for animal subjects. More recently, researchers have devised non-verbal experiments which test for ToM in both children and apes (Marticorena 1406). While much research has been conducted under the classical notion of ToM, some researchers in recent years have argued that as a concept, it must be narrowed further (Penn and Povinelli 731). And, still others argue that ToM may not even be as consequential to reasoning about and predicting the behavior of others as previously thought (Heyes 2695). While human understanding of animal cognition has developed over the years despite disagreement over conceptual

understandings, it seems that the field may be at a crossroads in that conceptual work remains. This conceptual work will require not only a better understanding of ToM in humans but also the consideration that "mentalistic processes" may play an overstated role in predicting the behavior of others. This overestimation may in part be due to the long tradition of seeing man as the rational animal. Even more controversially, other animals may meet standards for this form of social reasoning long thought to be a defining trait of humanity.

This field of study has operated under a predictive paradigm which expects ToM to anticipate behavior. Initial thinking about this capacity attributed a highly predictive power to ToM. It was thought that without ToM, beings cannot reliably predict how others will behave. Premack and Woodruff established this way of thinking on the subject in their 1978 study when they concluded that with only a few exceptions are inferences not made in order to predict behavior and "assigning mental states to another individual is not a sophisticated or advanced act but a primitive one" (11). These inferences, they say, "amount to a theory of mind" and are universally made by humans (11). Their logic was as follows: "In assuming that other individuals want, think, believe, and the like, one infers states that are not directly observable and one uses these states anticipatorily to predict the behavior of others as well as one's own" (Premack and Woodruff 525). The philosopher Kristen Andrews explains in her article "Chimpanzee Theory of Mind: Looking in All the Wrong Places" that under the old model, ToM researchers generally assumed "a robust predictive function for theory of mind" (524). The assumption that assigning mental states was just part and parcel to reading the behaviors of others has, over the years, been questioned. This issue was most thoroughly addressed by Daniel

Povinelli and Jennifer Vonk in their article “We Don’t Need a Microscope to Explore the Chimpanzee's Mind.” In a departure from the predictive paradigm which asserts that where there is prediction, there is mentalistic activity, Vonk and Povinelli have suggested that a behavioral psychological system can account for most prediction while leaving the possibility for a mentalistic psychological system to aid in “responding appropriately in relatively novel situations” (Povinelli, Vonk 10). Given the descriptive difficulty in distinguishing a mentalistic from a behavioral psychological system, Vonk and Povinelli have argued against the experimental paradigm used to conclude chimpanzees do reason about behavior and mental states. In their view, the experimental paradigm at the time of writing was inadequate in supporting the hypothesis. Going forward, they argue that humans should not preclude chimpanzees from being able to reason about mental states, however, experimental design must be improved upon to provide greater confidence in the conclusions drawn. Central to answering the question of whether non-human animals have a ToM is understanding what Vonk and Povinelli termed the “gentle controversy” (1). The controversy stems not only from disagreement about how to best investigate and study the question at hand but also emanates from the inherent difficulty in distinguishing between behavioral and mentalistic processes in the brain.

The ‘gentle controversy’ refers to the persistent debate within the cognitive sciences over whether humans alone demonstrate ToM. This controversy asks the question of whether humans “share the ability to reason about mental states (at least to some degree) with other species” (Povinelli and Vonk 1). Some researchers argue that enough aspects of ToM, as the definition currently stands, have been demonstrated via laboratory testing to conclude that “not only is thinking not the exclusive province of

human beings, but thinking about thinking is not either" (Schmelz et al 2). Others in the arena like Povinelli and Vonk maintain a more conservative view on the conclusions which have been drawn. Despite their critique of the current experimental paradigm and the conclusions which have been drawn from it, they do not rule out the possibility that chimpanzees may be shown to reason about mental states provided certain theoretical and methodological issues are addressed. The behavioristic/mentalistic dualism is key to understanding the split within the research community and reveals why the search for ToM has proved elusive and why the gentle controversy continues to this day. At the heart of this controversy is a difference of opinion about how best to test for and distinguish the presence of mentalistic process rather than mere behavioral process.

Many of the studies published on this topic refer to a psychological distinction between behavioristic and mentalistic kinds. I will first explain what researchers have meant by these terms and then lightly touch on the philosophical problem with creating the distinction in the first place. A behavioristic mode of thinking is classically thought to stem from prior experience (*a posteriori*). Prior experiences allow humans and animals to reason about behavior based upon their background knowledge. Behavioristic thinking might be cue-based meaning learned from specific social situations that have been experienced or knowledge-based meaning behavior is predicted based upon an extrapolation by an individual about certain stimuli. In contrast, a mentalistic mode of thinking presumably does not recruit information from prior experiences. This kind of thinking is only demonstrated in novel circumstances, researchers say, when the subject has not likely encountered an analogue to the problem at hand. Andrews has noted a consensus amongst researchers in regard to animals using a behavioristic kind of thinking

to varying degree depending on the circumstance to make basic categorization judgements which lead them to predict the behavior of conspecifics and humans (523). A lack of consensus remains as to whether non-human animals ever need to rely on a purely mentalistic kind of thinking involving the consideration and assignment of mental states when prompted to predict behavior. To add greater confusion to the matter, some researchers are skeptical about whether human beings even use a mentalistic mode of thinking most of the time to predict behavior (Heyes).

The Current Debate

While views within the research community have shifted on this question of ToM in non-human animals, the debate generally has broken up into two camps. While both camps have taken divergent stands in an important respect, namely one presents ToM in chimpanzees as a factual claim and the other remains skeptical, they also agree on some important points, namely that theory of mind is important for prediction. In one camp, the argument for ToM in chimpanzees is asserted as the most parsimonious explanation (Tomasello *et al* 239-240). This interpretation of the empirical evidence relies upon a definition of theory of mind that does not require false belief as a necessary condition (but continues to pursue its confirmation nevertheless). False belief tasks have been set as a bar within the community for full-fledged ToM to be granted. Researchers, like those in Leipzig, Germany at the Max Planck Institute for Evolutionary Anthropology have set out to design better ways to test for this capability. Historically, chimpanzees have not been able to pass false belief tests. In 2008, researchers concluded in a 30-year review since Premack and Woodruff's article that while chimpanzees may have certain aspects of ToM, they continue to fail tasks that would support the conclusion that they

understand false beliefs (Call and Tomasello). However, efforts since 2008 have been made to design and conduct more novel studies which have garnered new results. In 2016, a study was conducted using gaze anticipation to determine whether chimpanzees would gaze at a location where they expected another chimpanzee would falsely gaze. The authors of the study claim that this experiment showed how "great apes also operate, at least on an implicit level, with an understanding of false beliefs" (Krupenye *et al* 110). Researchers in this camp generally argue that while our understanding of false beliefs in chimpanzees is nascent, they already demonstrate enough of the other qualities (such as seeing and knowing what others see) to say that chimps do have a limited ToM while acknowledging there is still more to learn. Another segment of the research community argues important theoretical and methodological concerns persist relating to the difficulty in distinguishing between behaviouristic and mentalistic processes. This camp claims that while certain capabilities have been established in chimpanzees for example, there remain too many design flaws within the current research paradigm to claim that compelling evidence for "anything even remotely resembling a theory of mind" exists (Penn and Povinelli 731). According to Penn and Povinelli, a study done by Hare *et al* entitled "Do Chimpanzees Know What Conspecifics Know" is the most often cited by others as proof for theory of mind. They argue the flaw in this study and others like it is found in an experimental paradigm that "lacks the power, even in principle, to distinguish between responses by the subordinate that could have been produced simply by employing observable information and representations of past behavioral patterns (i.e. *p*- and *r*-states) from responses that must have required computations involving information about the dominant's unobservable mental states (i.e. *ms* states)" (Penn and Povinelli 735).

At the heart of the divergence of interpretation is a conceptual confusion about what ToM minimally requires and what it looks like in non-verbal animals. One proposed solution to this impasse articulated by the philosopher Kristen Andrews is to move away from the predictive paradigm, toward an explanatory one (Looking in All the Wrong Places 12). Under a predictive paradigm, the researcher assumes ToM assists in prediction and that statistically significant correct predictions provide evidence of the existence of ToM. Under an explanatory paradigm, ToM is presumed to merely explain or make sense of the behavior of others. If, as has been suggested, ToM serves primarily an explanatory rather than predictive function, then new experimental methods and models not designed around the expectation of prediction will be necessary.

While there is a consensus based on empirical evidence that chimpanzees use categories to make basic judgements (one might call this a form of reasoning) researchers have not been able to form a consensus regarding mental state attribution in animals. Both methodological impediments and philosophical questions remain regarding how ToM is currently understood. The current discussion of ToM in animals continues to refer to a class-based, binary system of thought that frames questions of animal capability in anthropocentric terms. Because ToM is viewed as an important distinguisher that is supposed to represent unique powers of the human mind, the way research is conducted has implications for making conclusions about animal minds.

Avoiding Anthropofabulation

Critics of the way ToM has been studied allude to the influence of anthropocentrism in many studies. Buckner identifies three possible expressions of this anthropocentrism, those being methodological, evaluative and semantic (2013). Honing

in on the semantic errors, Buckner notes a tendency to represent systems according to inflated notions of human mental function such as the representation of ToM by Povinelli and Vonk (2004). Buckner also notes the methodological concerns brought by Boesch (2007) who in a comprehensive review of ToM literature noted "how nearly every experiment violates these ideals of fairness by pitting captive chimpanzees against free-ranging humans, humans working with conspecifics against chimpanzees working with heterospecifics, humans with parents nearby against apes without parents nearby, or humans on familiar materials against apes on unfamiliar materials" (Morgan's Canon 866). Buckner terms these transgressions anthropofabulation. Anthropofabulation is both the overestimation of human capacity and comparison of animal minds against an exaggerated understanding of human cognition. Such an error serves to devalue other minds for lack of complete compliance with some human capacity; a classic anthropocentric and domineering move. Theory of mind, a marker of cognition and expression of a rational faculty, is an example of the way a research area can perpetuate certain hierarchical notions and dualisms which ultimately work to establish animals as, in the eyes of science, lesser than rather than non-hierarchically different. Some research is being conducted in less anthropocentric terms. From this view, animal minds are considered not in contrast to humans but in relation to their respective species-specific ecological contexts.

Executive Control and Rational Inference

One way to move past the rational/non-rational dualism is to speak more specifically about what is meant by the term 'rationality' and breaking it down into its constituent parts. Cameron Buckner pivots away from the term rationality arguing that

rationality is at base level inference and refers to inference as the "mental process of arriving at a conclusion on the basis of reasons which support it" (Rational Inference 2). Buckner questions whether language is an important part of establishing rationality in order to "defend a model of nonlinguistic inferences that shows how they could be practically rational" (Rational Inference 1). Buckner's "aim is to establish the lowest bounds of rational inference, arguing that many (though not all) of these opaque judgments in nonlinguistic animals should be counted as inferential" (Rational Inference 1). This requires, he argues, doing conceptual work in assessing which actions in a sense fall into the Cartesian category of automaticity, which have "inferential status" and which occupy a middle ground in between (3). Setting up a contrast between theoretical and practical inference, Buckner proceeds to argue that "A theory of inference must minimally solve this "demarcation problem" by identifying a shared character that inferences possess and non-inferential judgments lack" (2). It is his conclusion that many of the observational studies done on elephants, and lions leave open the "possibility of rational decision making" in "non-linguistic agents" (Rational Inference 1). Buckner's model for studying and classifying animal cognition is based on a spectrum rather than a dichotomy. Such a model can better represent the wide range of cognitive abilities across the animal kingdom including capacities for rational inference. Additionally, Buckner is drawing on ecologically contextualized studies.

Cognitive research, so long as it is done in ways that do not harm animals and do not further remove animals from wilderness and do not perpetuate narrow paradigms for assessing capabilities can assist humanity in part in achieving Gruen's goal of learning more about others and also reflect back ways that we view ourselves as a species. The

theory of entangled empathy requires us to attempt to take the perspective of other animals. One way this can be done is with a recognition of species-based difference but also a scientifically grounded understanding of a given species' capabilities, including cognitive ones. Despite the controversies within animal cognition, the scientific literature is clear that animals not only have minds, but they use them in ways that varyingly resemble our own. This would ideally be viewed as neither a compliment to nor slight against non-human animal cognition. However, such information often has the unintended effect of either affirming or disproving preconceived notions about the value of non-human animals. Ultimately, the human/nature or more specifically rational/non-rational dualism will be more difficult to deconstruct than simply observing that other animals can demonstrate to varying degree a wide range of cognitive abilities formerly denied to them. While it will be difficult to establish a healthy relationship with other animals, I will present one possible existential imperative for doing so. As I will propose in the final section, the Western view of animals as mindless, non-rational beings available for instrumental use by humans presents potentially problematic implications.

Section 4

Conclusion

> The master culture must now make its long-overdue homecoming to the earth. This is no longer simply a matter of justice, but now also a matter of survival.
>
> — *Val Plumwood, Feminism and the Mastery of Nature*

I began to conceive of this work with an interest in understanding the hyper-separation between humans and animals. I wondered whether this dynamic might have something to do with the way most animals, with the rare exception of certain domesticated ones, are not just deplorably treated but are systematically and profitably abused and slaughtered for human consumption. My interest in this question led me to notice traces of a kind of dualistic thinking that pitted humans against animals in some of the formative works chosen from the Western canon. In my research, I detected the presence of a system of thought surrounding other animals with rationality at its center. I began to question whether current popular opinion about animal cognition was evidenced-based or socially constructed. Based on my review of relevant philosophical and scientific literature, I concluded that traditional Western conceptions of animal minds as minimally conscious and essentially non-rational is more social construct than scientific consensus. To come to this conclusion, I reviewed some of the more prominent works from the Western canon through an ecofeminist lens, taking note of passages in which, the establishment of a clear hierarchy and dualistic thinking could be read. From this analysis, a logic of domination emerged. I contend this logic is one of many forces which drive the animal agriculture industry and in doing so, has contributed in part to the problem of climate change. In this final section, one possible implication of maintaining

the traditional conception of animal cognition will be explored. While there are many consequences of animal agriculture including risks to public health such as antibiotic resistance and novel influenza, I will limit my summary in this final section to a description of how a logic of domination in which humans assume superiority and justify subordination of animals based on a hierarchy of value that places "rational" humans above "non-rational" animals in part bolsters animal agricultural practices which in turn contribute partially to climate change. In what follows, I will describe the role of animal agriculture in the climate crisis and how I see the ecofeminist constructs of value hierarchy and oppositional value dualisms at work in the multifaceted issue of climate change. Finally, I will suggest how transitioning away from an animal-based agricultural system as ecological feminist praxis may help to reach goals set out by the most recent Intergovernmental Panel on Climate Change (IPCC) report *Global Warming of 1.5*° C.

The Livestock Sector Impact

The word livestock is etymologically interesting as it encapsulates the instrumentalization of nature for human use through the conjunction of counterintuitive terms. The term live in the context of the word livestock refers to living, domesticated animals such cows, chickens and pigs which are raised for human use and consumption. The term stock refers to something that is owned but can be bought and sold. As opposed to other forms of property, animals are most notably alive and capable of not just sentience but in some cases, higher forms of cognition. The conflation of a conscious being with a commodity problematically suggests that living beings are things to be owned and used for the profit of others and are to be treated in the same way as inanimate objects. The word livestock is only one example of standard industry jargon that has been

sterilized to the point of unquestioning acceptance and usage without concern for its implications. While there are several known contributors fueling climate change, one underestimated yet influential sector is the livestock industry. In 2006, the United Nations Food and Agricultural Organization (FAO) published a startling report entitled *Livestock's Long Shadow: Environmental Issues and Options*. This report set out to assess the full impact of the livestock industry on various environmental measures. The study found the livestock sector to account for 18% of greenhouse gas emissions (GHG) which at the time was a larger proportion than the transportation sector (Steinfeld xxi). With improved data collection methods and analysis, the GHG number now stands, according to the FAO, at 14.5%. Even at this more conservative number, the livestock sector remains one of the major contributors to climate change. In the latest IPCC report, "dietary shifts away from emissions-intensive livestock products" in addition to other improvements pertaining to the livestock sector "(e.g., improved management of water in rice production, manure and herds, and better livestock quality through breeding and improved feeding practices)" will be key to following mitigation pathways that are compliant with not exceeding a 1.5°C change (Rogellj 147). The report states "Residual agricultural emissions can be further reduced by limiting demand for GHG-intensive foods through shifts to healthier and more sustainable diets" (147). To clarify, less healthy diets are associated with "high animal shares" and healthy diet with "low animal-calorie shares" (147). While it is noted in the report that "plant based and synthetic proteins" will play a role, the extent to which diet will need to be altered is detailed in a complimentary report I will reference in the section on diet shift. Given these findings and the strong recommendations from the IPCC to transition our agricultural system

away from animal to plant-based agriculture, it is worth considering how the human species might be incentivized to begin to change the human-animal dynamic from one of oppressive mass instrumentalization to one that ceases to see animals, as Cora Diamond put it, in the category of 'edible.'

Ecofeminist Constructs

While the effects of climate change will be far reaching, some groups are predicted to be more vulnerable than others to its impacts. Due to structural inequalities, women are projected to be disproportionately affected by climate change "primarily as they constitute the majority of the world's poor and are more dependent for their livelihood on natural resources that are threatened by climate change" (UN Fact Sheet Women, Gender Equality and Climate Change). Additionally, producers of what Carol J Adams has called "feminized proteins" bear the greatest burden in the agricultural sector (location 438). Climate change is, among many other classifications, a feminist issue. As such, ecofeminist constructs can assist in the analysis of and reveal conceptual mechanisms which contribute to the climate crisis. Due to the historical glorification of rationality and devaluation of non-human animals, a Western hierarchical model would place rationality at the top and non-rationality toward the bottom. Humans have always occupied the upper thresholds along with rationality and conversely, animals a lower threshold. Given this historical conception, animals have traditionally been deemed lesser than and due to their supposed non-rational status, subject to the control and domination of "higher" powers. It has been my contention that the modern agricultural system, based in part on a livestock sector which utilizes the bodies and lives of innumerable animals (many of them female) is arguably aided in part by the Western view of animal cognition.

Because of the location of animals on the value hierarchy, the labor done by animals to produce food is largely made invisible. While value hierarchies and value dualisms help to make visible previously unrecognized relationships, a logic of domination provides the reasoning necessary to justify power of one over another. Operating concurrently with a value hierarchy are value dualisms such as culture/nature and rational/non-rational disjuncts which have reinforced the assumed inferiority of animal lives. It is my contention that the same logic of domination that is at work in the Western canon to establish the non-rational status of non-human animals and thereafter justify their inferiority and separateness may in part facilitate an animal agricultural system that commodifies animal lives at the expense of the biosphere.

One of the minimal criteria for distinguishing ecofeminist scholarship from other disciplines and fields of study is the agreement that "important connections between the domination of women and the domination of nature" can be made (Warren). As Warren describes, the ecofeminist project is to "make visible these connections" and "where harmful dismantle them." This women-nature connection has many formulations. I suggest here that the conceptual link between humans and rationality and animals and non-rationality should be questioned considering the published research. The dismantling of this disjunct is not to be conflated with promoting the notion of sameness or uncritical equality (Plumwood, Feminism and Mastery 27). As Gruen explains, "like us" or "extentialist" arguments are problematic because they end up reinforcing the dichotomies one might seek to deconstruct. In conclusion, I assert that "anti dualist remedies" are needed (Plumwood 41). One such remedy, I contend, is diet.

Diet Change

One way to begin to deconstruct the logic of domination is to shift the food system away from one that perpetuates a relationship characterized by instrumentalization of other conscious and cognitive beings. Gruen's model provides insight into how this can be done. One of her first steps is to acknowledge that "we are already in relationships with animals" (Gruen Entangled loc. 174). Once this is done, the second step is to assess the "quality and meaning of these relationships" (Gruen Entangled loc. 886). It is clear from only a cursory look into conditions in commercial livestock operations that they are characterized by abuse and general disregard for animal life. Afterall, the express purpose of many facilities is to efficiently snuff animal life out for the purposes of human consumption. Knowing this to be the case, on an individual scale, aspiring for Veganism is one option (Gruen & Jones).

Additionally, according to the most recent IPCC report, diets worldwide will need to shift towards more plant-based foods to avoid a 1.5 degree Celsius change in temperature (above pre-industrial levels). One study from the Oxford Martin Programme on the Future of Food, in response to the IPCC investigated the various dietary measures that could be taken to have the greatest probability of meeting the UN's goal. The study's authors stated, "Dietary changes towards healthier diets can reduce the environmental impacts of the food system when environmentally intensive foods, in particular animal products, are replaced by less intensive food types" (Springmann 3). The report couches dietary changes in terms of baseline, moderate and ambitious. Under the ambitious guidelines, the world will have the greatest likelihood of meeting targets and mitigating the predicted catastrophic effects of climate change. While the authors note a multi-

pronged approach will be most advantageous, they do also acknowledge that “In line with the differentiated impacts of the different measures of change, dietary change contributes the most to the reductions in GHG emissions, and technological and management related changes contribute the most to reductions in the other environmental impacts, while reductions in food loss and waste contribute up to a third to the overall reductions” (Springmann). The authors make clear the impact meat consumption has through their quantitative data, explicitly stating that:

> Changes in meat consumption dominate the impacts on GHG emissions, while for the other domains the environmental pressures associated with greater consumption of fruits, vegetables, nuts and legumes are more important but outweighed by the environmental benefits associated with lower consumption of meat, staple crops and sugar, and a generally lower energy intake in line with healthy body weights and recommended levels of physical activity. (Springmann et al. 3).

With regard for reducing environmental pressures, the greatest reductions would come about as a result of high ambition measures being taken.

> Combining all measures of medium ambition could reduce environmental pressures by around 25–45% compared with the baseline projection for 2050, resulting in total environmental impacts that are within 15% above and below present impacts. Combining all measures of high ambition could deliver reductions of 30–60%, resulting in environmental impacts that are 20–55% less than the current ones. (Springmann et al. 3)

Considering the threat that climate change poses, it seems that a rational choice for the human species given the available options and presumed shared value of sustaining life on earth, would be to adhere to a strategy that will provide the best odds of avoiding the worst impacts of unprecedented changes to the climate. I have maintained in this work that reconceiving of non-human animal minds and reconstructing the human-animal relationship from one characterized by instrumentalization to one of interdependence may play a role in promoting a change in the habits which support an unsustainable animal agricultural system that is in part fueling climate change. Becoming aware of the historical and cultural conceptions of non-human animal cognition, while not guaranteed to directly impact human behavior, may at the very least lead to an examination of one's own relationship to other animals and the environment. Learning more about the mental lives of other animals, may nurture a stronger sense of empathy by allowing humans to better take the perspectives of non-human animals. Ultimately, time spent pondering historical conceptions of non-human animal cognition may illuminate something about human cognition that may in turn help humans to live in more interdependent and interconnected ways in the world. In the face of climate change, a shift in the Western perspective is needed more than ever.

Works Cited

Andrews, Kristin. "Chimpanzee Theory of Mind: Looking in All the Wrong Places?" *Mind and Language*. 20.5 (2005): 521-536. Print.

Adams, Carol J. *Sexual Politics of Meat*. Bloomsbury Publishing, 2015. Internet resource.

Ares, Elena. "Animal Sentience and Brexit." *Commons Library Briefing - UK Parliament*, 8 Aug. 2018, researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-8155.

Aristotle, , A L. Peck, and D M. Balme. *Historia Animalum*. London: William Heinemann, 1970. Print.

Arkes, H. R., & Ayton, P. (1999). The sunk cost and concorde effects: Are humans less rational than lower animals? *Psychological Bulletin, 125*(5), 591-600. doi:http://dx.doi.org.ezproxy.rollins.edu:2048/10.1037/0033-2909.125.5.591

Bastian, Brock, et al. "Don't Mind Meat? The Denial of Mind to Animals Used for Human Consumption." *Personality and Social Psychology Bulletin*, vol. 38, no. 2, Feb. 2012, pp. 247–256, doi:10.1177/0146167211424291.

Blaisdell, Aaron P, Kosuke Sawa, Kenneth J Leising, and Michael R Waldmann. "Causal Reasoning in Rats." *Science (New York, N.Y.)* 311.5763 (2006): 1020-2. Web.

Buckner, Cameron. "Morgan's Canon, Meet Hume's Dictum: Avoiding Anthropofabulation in Cross-species Comparisons." *Biology & Philosophy* 28.5 (2013): 853. Web.

Carlson, Stephanie M., Melissa A. Koenig, and Madeline B. Harms. "Theory of Mind." *Wiley Interdisciplinary Reviews: Cognitive Science* 4.4 (2013): 391-402. Web.

Descartes, Rene. *Discourse on the Method*. New York: Sheba Blake Publishing, 2015. Internet resource.

EFRA Select Committee, Pre-Legislative Scrutiny of the draft Animal Welfare (Sentencing and Recognition of Sentience) Bill, 2nd report of Session 2017-19, 31 January 2017

FAO. "Animal Production." *International Rice Commission Newsletter Vol. 48*, FAO of the UN, www.fao.org/animal-production/en/.

Gruen, Lori. *Entangled Empathy: An Alternative Ethic for Our Relationships with Animals*. , 2015. Print.

Gruen, L., & Jones, R. (2015). Veganism as an Aspiration. In The Moral Complexities of Eating Meat. : Oxford University Press.

Haraway, Donna J. *When Species Meet*. Univ of Minnesota Press, 2007. Print.

"Animal Production." *International Rice Commission Newsletter Vol. 48*, FAO of the UN, www.fao.org/animal-production/en/.

Heyes, Cecilia. "Simple minds: a qualified defence of associative learning"*Philosophical transactions of the Royal Society of London. Series B, Biological sciences* vol. 367,1603 (2012): 2695-703.

Hills, Adelma M. (1995) Empathy and Belief in the Mental Experience of Animals, Anthrozoös, 8:3, 132-142, DOI: 10.2752/089279395787156347

hiperf289. "Jacques Derrida And The Question Of 'The Animal.'" *YouTube*, YouTube, 18 Dec. 2008, www.youtube.com/watch?v=Ry49Jr0TFjk.

Hobbes, Thomas. Leviathan. Tustin: Xist Publishing, 2015. Internet resource.

IPCC, 2018: *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)].

Krupenye, Christopher, et al. “Great Apes Anticipate That Other Individuals Will Act According to False Beliefs.” *Science*, vol. 354, no. 6308, Oct. 2016, pp. 110–114. *EBSCOhost*, doi:10.1126/science.aaf8110.

Low, Phillip. “The Cambridge Declaration on Consciousness.” Ed. Jaak Panksepp and Diana Ross and David Edelman and Bruno Van Swinderen and Christof Koch. Francis Crick Memorial Conference, 2012. Web 22 March 2019.

Marticorena, Drew C. W. ; Ruiz, April M. ; Mukerji, Cora ; Goddu, Anna ; Santos, Laurie R. Monkey’s represent others’ knowledge but not their beliefs. Developmental Science, November 2011, Vol.14(6), pp.1406-1416

Maust-Mohl, Maria, John Fraser, and Rachel Morrison. "Wild Minds: What People Think about Animal Thinking." *Anthrozoös* 25.2 (2012): 133-47. Web.

Morgan, Conway L. *An Introduction to Comparative Psychology*. London: Walter Scott Pub. Co, 2012. Internet resource.

Penn, Derek C and Daniel J Povinelli. “On the lack of evidence that non-human animals possess anything remotely resembling a 'theory of mind'” *Philosophical*

transactions of the Royal Society of London. Series B, Biological sciences vol. 362,1480 (2007): 731-44.

Plato, and Robin Waterfield. *Phaedrus*. Oxford: Oxford University Press, UK, 2002. Internet resource.

Pope, Alexander. "Against Barbarity to Non-human animals." The Chain of Being and the Cry of Nature. Ed. Soame Jenyns, Samuel Johnson, and John Oswald. Bristol, England: Thoemmes Press, 2000. 260-267. Internet resource.

Pope, Alexander. An Essay on Man: Moral Essays and Satires. London: Cassell, 1891. Internet Resource.

Porphyry. and Taylor, Thomas. *Select works of Porphyry : containing his four books On abstinence from animal food; his treatise on The Homeric cave of the nymphs; and his Auxiliaries to the perception of intelligible natures / translated from the Greek by Thomas Taylor ; with an appendix, explaining the allegory of the wanderings of Ulysses / by the translator* Printed for Thomas Rodd London 1823

Povinelli, Daniel J, and Jennifer Vonk. "Chimpanzee Minds: Suspiciously Human?" *Trends in Cognitive Sciences*. 7.4 (2003): 157-160. Print.

Premack, David, and Guy Woodruff. "Does the Chimpanzee Have a Theory of Mind?" *Behavioral and Brain Sciences*. 1.4 (1978). Print.

Regan, Tom. *The Case for Animal Rights*. Berkeley: University of California Press, 2004. Print.

Risaliti, Valentina. "Ariel Salleh, Ecofeminism as Politics (Interview)." *YouTube*, YouTube, 19 June 2017, www.youtube.com/watch?v=GI5TjFOIXes.

Rogelj, J., D. Shindell, K. Jiang, S. Fifita, P. Forster, V. Ginzburg, C. Handa, H. Kheshgi, S. Kobayashi, E. Kriegler, L. Mundaca, R. Séférian, and M.V. Vilariño, 2018: Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

Schmelz, Martin et al. “Chimpanzees know that others make inferences”*Proceedings of the National Academy of Sciences of the United States of America* vol. 108,7 (2011): 3077-9.

Singer, Peter. *Animal Liberation*. New York, N.Y: New York Review of Books, 1990. Print.

Spence, Osman, and Mcelligott. "Theory of Animal Mind: Human Nature or Experimental Artefact?" *Trends in Cognitive Sciences* 21.5 (2017): 333-43. Web.

Springmann, Marco; Clark, Michael; Mason-D’Croz, Daniel; Wiebe, Keith D.; Bodirsky, Benjamin Leon; Lassaletta, Luis; de Vries, Wim; Vermeulen, Sonja J.; Herrero, Mario; Carlson, Kimberly M.; Jonell, Malin; Troell, Max; DeClerck, Fabrice; Gordon, Line J.; Zurayk, Rami; Scarborough, Peter; Rayner, Mike; Loken, Brent; Fanzo, Jess; Godfray, H. Charles J.; Tilman, David; Rockström, Johan; and

Willett, Walter. 2018. Options for keeping the food system within environmental limits. Nature 562(10 October 2018): 519-525. https://doi.org/10.1038/s41586-018-0594-0.

Stanovich, KeithE. “Why Humans Are (Sometimes) Less Rational than Other Animals: Cognitive Complexity and the Axioms of Rational Choice.” *Thinking & Reasoning*, vol. 19, no. 1, Feb. 2013, pp. 1–26. *EBSCOhost*, doi:10.1080/13546783.2012.713178.

Steinfeld, Henning. *Livestock's Long Shadow: Environmental Issues and Options*. Rom: FAO, 2006. Print.

Sosis, Clifford, and Michael A Bishop. "Rationality." *Wiley Interdisciplinary Reviews: Cognitive Science* 5.1 (2014): 27-37. Web.

Taylor, Angus, John W. Burbidge, and Angus Taylor. *Animals & Ethics: An Overview of the Philosophical Debate*. Peterborough, Ont: Broadview Press, 2009. Internet resource.

MacKinnon, Mary H, and Moni McIntyre. *Readings in Ecology and Feminist Theology*. Kansas City, Mo: Sheed and Ward, 1995. Print.

Plumwood, Val. “Nature, Self, and Gender: Feminism, Environmental Philosophy, and the Critique of Rationalism.” *Hypatia*, vol. 6, no. 1, 1991, pp. 3–27. *JSTOR*, JSTOR, www.jstor.org/stable/3810030.

Plumwood, Val. *Feminism and the Mastery of Nature*. London: Routledge, Taylor & Francis Group, 2015. Print.

Vaart, Elske, and Charlotte Hemelrijk. "‘Theory of Mind’ in Animals: Ways to Make Progress." *Synthese* 191.3 (2014): 335-54. Web.

Warren, Karen. *Ecofeminist Philosophy: A Western Perspective on What It Is and Why It Matters*. Lanham: Rowman & Littlefield Publishers, 2000. Print.