Introduction

In the spring of 1924, the London Zoo unveiled a new and improved aquarium to great fanfare – its opening was presided over by no less than the king and queen themselves. It had been seventy-one years since the zoo had built the "Fish House," the very first public aquarium, which had sparked an "aquarium craze" among the Victorians. In the intervening years, the marine life on display had continued to draw large crowds, necessitating larger facilities in Regent's Park.[1] *The Nation and Athenaeum* ran a short review of the new aquarium a couple of weeks after its opening, an odd bit of prose which declined to offer any concrete information about the zoo's history, the renovation project, the public reception, or the species stocked. This review, penned by an up-and-coming writer named Virginia Woolf, reads as follows:

> Aesthetically speaking, the new aquarium is undoubtedly the most impressive of all the houses at the zoo. Red fish, blue fish, nightmare fish, dapper fish, fish lean as gimlets, fish round and white as soup plates, ceaselessly gyrate in oblong frames of greenish light in the hushed and darkened apartment hollowed out beneath the Mappin terraces. Scientifically, no doubt, the place is a paradise for the ichthyologist; but the poet might equally celebrate the strange beauty of the broad-leaved water plants trembling in the current, or the sinister procession of self-centred sea-beasts forever circling and seeking perhaps some minute prey, perhaps some explanation of a universe which evidently appears to them of inscrutable mystery. Now they knock the glass with their noses; now they shoot dart-like to the surface; now eddy slowly contemplatively down to the sandy bottom. Some are delicately fringed with a fin that vibrates like an electric fan and propels them on; others wear a mail boldly splashed with a design by a Japanese artist. That crude human egotism which supposes that Nature has wrought her best for those who walk the earth is rebuked at the aquarium. Nature seems to have cared more to tint and adorn the

[1] "The History of the Aquarium," *ZSL London Zoo*: www.zsl.org/zsl-london-zoo/exhibits/the-history-of-the-aquarium.

> fishes who live unseen at the depths of the sea than to ornament our old, familiar friends, the goat, the hog, the sparrow, and the horse.[2]

Woolf perceives the aquarium as simultaneously a space of scientific observation, where ichthyologists might study a multitude of living fish, and a source of aesthetic inspiration for the writer. The aquarium harbors a "strange beauty" of abstract colors and moving shapes, "sinister" and "inscrutable" rather than classical, reminiscent of the Japanese art forms that many poets and artists in Woolf's milieu appreciated and appropriated – in short, a modernist beauty.[3]

At the same time that Woolf links the zoological display of the aquarium to modernist aesthetics, she also pursues a Darwinian project of decentering humans. The review is resolutely secular in its assumption that nature is not for humans, that it was never created for us, and that to believe otherwise is arrogant and "crude." When Woolf points out that the fishes, rarely seen by human eyes, are more beautiful than the animals we live with, she echoes one of Darwin's most controversial claims: that the beauty of birds, orchids, butterflies, and other living beings was not designed by God for our enjoyment, but instead evolved for the species' own benefit.[4] As Darwin pointed out in *The Origin of Species*, some naturalists "believe that very many structures have been created for beauty in the eyes of man, or for mere variety. This doctrine, if true, would be absolutely fatal to my theory."[5] He doubled down on this notion in *The Descent of Man*, writing, "I know of no fact in natural history more wonderful than that the female Argus pheasant should be able to appreciate the exquisite shading of the ball-and-socket ornaments and the elegant patterns on the wing-feathers of the male."[6] Yet it is that bird's taste that selected for such beautiful plumage. Woolf, likewise, marvels at the

[2] Virginia Woolf, *The Essays of Virginia Woolf*, vol. 3, ed. Andrew McNeillie (Harcourt Brace Jovanovich, 1985), 404–5.

[3] On Anglo-American modernism's engagement with Japan and Japanese art, see Yoko Chiba, "Japonisme: East-West Renaissance in the Late 19th Century," *Mosaic* 31.2 (1998): 1–20; Andrew Thacker, "'Mad After Foreign Notions': Ezra Pound, Imagism and the Geography of the Orient," in *Geographies of Modernism: Literatures, Cultures, Spaces*, ed. Peter Brooker and Andrew Thacker (Routledge, 2005), 31–42; and Rupert Richard Arrowsmith, *Modernism and the Museum: Asian, African, and Pacific Art and the London Avant-Garde* (Oxford University Press, 2011), 103–27.

[4] For an account of how Darwin's evolutionary aesthetics disturbed Victorian thinkers, most notably John Ruskin, see Jonathan Smith, *Charles Darwin and Victorian Visual Culture* (Cambridge University Press, 2006), 3.

[5] Charles Darwin, *On the Origin of Species by Means of Natural Selection* [1859], ed. J. W. Burrow (Penguin Books, 1985), 227.

[6] Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, vol. 1 (John Murray, 1871; repr. in *The Complete Work of Charles Darwin Online*, ed. John van Wyhe: www.darwin-online.org.uk), 400–1.

fishes' splendor, the ornamentation that, evolutionary theory instructs, is not for us but for them.

Those "self-centred sea-beasts," displaced into tanks in metropolitan London for people to look at, subjected to the scientific gaze and to aesthetic contemplation, are also mysterious subjects in their own right. Woolf supposes that they are up to something when they gambol about the aquarium, looking for food or for answers, "perhaps some explanation of a universe which evidently appears to them of inscrutable mystery." They look back at the viewer, "knock[ing] the glass with their noses." The nature of their experience is impossible to surmise, but Woolf attributes some intention, however, nebulous and inaccessible, to their motions. They inhabit a "universe," a world overlapping with but utterly distinct from our own.

This book proposes that Woolf's review, which makes the aquarium a site of scientific interest, aesthetic novelty, and animal worlds, is not just a one-off, but represents a broader pattern in modern British culture. Woolf belonged to a network of writers and biologists who were deeply invested in the question of how to represent animal subjectivity, and whose forays into animal worlds shaped their understanding of science and literature. Coming of age after Darwin, these figures knew that there was good scientific reason for supposing that we evolved from animals and share with many animals some version of our "higher" traits, including the capacities for pain and pleasure, emotion, communication, some forms of intelligence, and, as Darwin made clear in the writings quoted above, an appreciation of beauty. They assumed, in other words, that many animals were sentient subjects rather than Cartesian automatons. Yet Woolf and her contemporaries also recognized the enduring difficulty of knowing or saying anything definitive about animal subjectivity, other than that it exists. Any claims they could make about it were speculative, provisional, open to accusations of anthropomorphism or excessive imagination. As the philosopher Thomas Nagel expressed the problem, "there is something that it is like to be a bat," but "there is no reason to suppose that it is subjectively like anything we can experience or imagine."[7] This quandary – one must understand animals as subjects, one cannot know animals' subjective experience – drove Woolf and her contemporaries to the very limits of literary and scientific representation.

[7] Thomas Nagel, "What Is It Like to Be a Bat?" *The Philosophical Review* 83.4 (1974): 435–50, quote on 438.

The obscurity of animal minds, however, did not preclude a blossoming of new zoological knowledge in the late nineteenth- and early twentieth centuries. An explosion of scientific and popular zoology was made possible by new technologies, new scientific approaches, and the new evolutionary theory, which created order out of the undifferentiated mass of facts collected by naturalists. Around the turn of the century, Christina Alt explains, "the long domination of taxonomic natural history was brought to an end by the combined impact of evolutionary theory and the new biology of the laboratory. As the twentieth century began, ethology [the study of animal behavior] and ecology also emerged as recognized disciplines and added a further dimension to the study of nature."[8] The change, she argues, was fundamental: the cataloging and categorizing of preserved specimens in museums gave way to a study of "the living organism, its behavior, and its interactions with its environment."[9] It was an age that saw the invention of the "ecosystem" and "niche" concepts; an era in which many naturalists traded in their guns for cameras; a time when behaviorists, ethologists, and psychologists, not to mention poets, competed over which theory afforded the best explanations of animal behaviors. It was also a period of mutual legibility between literature and science. Writers and scientists during this period went to the same movies, belonged to the same clubs, and wrote for the same presses. Drawing on each other's insights, they recognized the unsolved (and sometimes unsolvable) mysteries of animal life, but that recognition did not stymie their attempts to pursue greater knowledge.

This book examines animals in the literature of H.G. Wells, Aldous Huxley, D.H. Lawrence, and Virginia Woolf, as well as scientific and philosophical writings by Charles Darwin, Thomas H. Huxley, Charles Elton, Henry Eliot Howard, Julian Huxley, J.B.S. Haldane, Bertrand Russell, and C. Lloyd Morgan. These figures represent a wide range of intellectual approaches to animals and a variety of rhetorical tactics for writing about them, from the free verse animal poems of Lawrence to the spare, objective descriptions of Aldous Huxley; the revelatory calculations of Elton to the rich, ritualistic courtship scenes of Julian Huxley; the sensuous animal perspectives of Woolf to the ironic fables of Wells. Yet all of these writers and scientists can be understood as responding to the same two questions: how should we understand animal life after Darwin? and, how can we capture animals in words that are true

[8] Christina Alt, *Virginia Woolf and the Study of Nature* (Cambridge University Press, 2010), 38.
[9] Ibid., 39.

to life? The pursuit of answers to these questions led even further down the rabbit hole, to the question of what constitutes "true" for each discipline. The scientists found themselves turning to the methods of fiction and poetry to better express animal subjectivity, while the literary writers found themselves adopting the observational techniques of science. The study of animals thus blurred the boundaries between literary and scientific forms of description, and indeed between literary and scientific ways of knowing.

Science and literature, in late nineteenth- and early twentieth-century Britain, shared a common environment in which they coevolved, sometimes in symbiotic and other times in antagonistic ways. They exchanged zoological ideas and representational strategies, producing science writing that feels strangely modernist and literature that is surprisingly committed to realism. Together, they created new species of thought about animals, ones that ventured outside the well-trodden paths of scientific reductionism, primitivism, and anthropocentric humanism.

Animal Subjectivity: Darwin, Freud, James

To call animals "subjects" requires some explanation, since many philosophical understandings of subjectivity would seem to exclude animals. If one becomes a subject by tacitly signing the Enlightenment social contract (cf. Hobbes, Locke), or by learning language and entering the Lacanian Symbolic, or by the interpellation of the state and ideological state apparatuses, as Althusser proposed, then it makes little sense to speak of animal subjects.[10] Animals, after all, lack human language and exist primarily as objects under the state.[11] If, on the other hand, we take a posthumanist point of view, the very notion of a "subject" may seem antiquated and objectionable. Bruno Latour's actor-network theory, the rhizomes of Deleuze and Guattari, Donna Haraway's companion species, Stacy Alaimo's transcorporeality, the distributed agency of Jane Bennett's

[10] Western philosophy's exclusion of animals has been deftly explored by a number of philosophers and critics, including Giorgio Agamben in *The Open: Man and Animal*, transl. Kevin Attell (Stanford University Press, 2004), Kelly Oliver in *Animal Lessons: How They Teach Us to Be Human* (Columbia University Press, 2009), and Carrie Rohman in *Stalking the Subject: Modernism and the Animal* (Columbia University Press, 2009).

[11] Recent developments such as legal protections for great apes in some countries challenge the notion that animals exist as objects under the state but, with a few exceptions, the general claim is still true. A few researchers believe that certain animals – most famously Koko the gorilla, Kanzi the bonobo, and Alex the grey parrot – have demonstrated human-like language use, but these claims are controversial and not widely accepted among linguists or primatologists.

"vibrant matter": what these influential posthumanist concepts have in common is that they emphasize the interconnected, multiplicitous, entangled nature of things.[12] For posthumanism, it makes little sense to speak of a subject, human or animal, when it is intersubjectivity – and intercorporeality – all the way down.

These posthumanist concepts are generative and insightful, but rather than apply them to modernism, I would like to bracket them and ask instead, in a historicist mode, how British writers and scientists of the late nineteenth- and early twentieth centuries would have understood subjectivity. We will find in this period a conception of the subject that embraces both human and nonhuman animals. The evolutionary biology and psychology of that age produced a more elemental definition of a subject as any being capable of subjective experience. This school of thought emphasized continuity, not rupture, between humans and animals. It was not posthumanist in the sense of being after, or over, humanism and all its structuring binaries – subject/object, mind/matter, culture/nature, etc. But it did resist anthropocentrism and envision a permeable border between self and world, traits that resonate with posthumanist projects today.

Darwin's work provides a foundation for this notion of subjectivity by outlining a naturalistic worldview and an evolutionary understanding of mind. His groundbreaking *Origin of Species* (1859) proposed that the species in the world today evolved from one or a few ancestors, without divine intervention. Famously, the *Origin* barely mentions the evolution of humans, devoting only a single sentence to it in the conclusion: "Light will be thrown on the origin of man and his history."[13] Darwin understood that while his book might convincingly show that plants and animals had evolved via natural selection, to persuade readers that people, too, had evolved, he would have to amass another kind of evidence. He would have to offer some plausible naturalistic explanation for the most apparently magical trait of *Homo sapiens* – its mind. It was one thing to say that human lungs or kidneys or even eyes evolved via natural selection from some ancient animal ancestor, but what about human

[12] Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network Theory* (Oxford University Press, 2005); Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, transl. Brian Massumi (University of Minnesota Press, 1987); Donna Haraway, *When Species Meet* (University of Minnesota Press, 2008); Stacy Alaimo, *Bodily Natures: Science, Environment, and the Material Self* (Indiana University Press, 2010); Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Duke University Press, 2010).

[13] Darwin, *Origin of Species*, 458.

language or art or morality? Those seemed much harder to explain within the evolutionary framework.

Darwin aimed to answer these unresolved questions in his 1871 follow-up to the *Origin*, *The Descent of Man*. In order to show that the human mind evolved under the same forces of natural and sexual selection that shaped the body, Darwin needed to demonstrate that every mental trait in humans exists, in some related form, in other animals. "If no organic being excepting man possessed any mental power, or if his powers had been of a wholly different nature from those of the lower animals," then Darwin's theory of humans' evolution would have been proven wrong, for evolution does not make leaps. "But," he argues, "it can be clearly shewn that there is no fundamental difference of this kind. We must also admit that there is a much wider interval in mental power between one of the lowest fishes, as a lamprey or lancelet, and one of the higher apes, than between an ape and man; yet this immense interval is filled up by numberless gradations."[14] Accordingly, Darwin devoted two chapters to "Comparison of the Mental Powers of Man and the Lower Animals." He claimed that animals were capable of emotions, a capacity for attention, memory, reason, self-consciousness, a sense of beauty, even a primitive kind of religious belief. While the immediate aim of these chapters was to show that each human mental trait reflected a natural development of animals' mental traits, the result was a rich and detailed portrait of animal subjective life that remains deeply important for both zoology and literary animal studies.

After the *Descent of Man*, psychology diverged into two streams that would prove influential for twentieth-century biology and literary modernism. The better known of these is Freudian psychoanalysis. Freud saw himself as a successor to Darwin in more than one sense. Both men's theories, like that of their Renaissance precursor Copernicus, dealt "severe blows" to "the universal narcissism of men," as Freud argued. Copernicus showed that Earth (and therefore humankind) was not the center of the universe; Darwin showed that "[m]an is not a being different from animals or superior to them; he himself is of animal descent"; and Freud showed that the unconscious determined human actions and thus that "*the ego is not master in its own house*."[15] As Gillian Beer points

[14] Darwin, *Descent of Man*, 34–5.

[15] Sigmund Freud, "A Difficulty in the Path of Psychoanalysis," in *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, vol. 17, ed. James Strachey (Hogarth Press, 1971), 141, 143; quoted in Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot, and Nineteenth-Century Fiction* [1983] (Ark Paperbacks, 1985), 12–13.

out, the triad seems to imply that the process of debunking anthropocentric humanism is complete: "[t]he magical number three belies the possibility of a fourth great wound."[16] Freud's self-aggrandizing mythopoesis notwithstanding, he makes an important point. Evolutionary theory and psychoanalysis, like heliocentrism, are humbling doctrines. They figure the human as an ape, a well-adapted one in Darwin's view or a neurotic one in Freud's, but in either case an ape.

Freud's psychoanalytic theory borrows from Darwin in more direct ways too. Chief among them is his allegorical retelling of the story of human evolution in his account of individual psychological development. As Carrie Rohman shows, Freud drew on recapitulation theory, the belief (prominent in late nineteenth- and early twentieth-century biology but now mostly discredited) that the biological development of an individual from embryo to adult repeats the evolutionary changes undergone by its ancestors.[17] The same, Freud held, was true for the human psyche – as infants develop, they recapitulate the stages their ancestors went through on their journey from animal to civilized human being. In *Totem and Taboo* (1913), Freud cites Darwin's hypothesis that the earliest form of human society resembled the social organization of the gorilla, a primal horde in which one powerful male ruled over many wives and other subservient males.[18] At some point in human prehistory, Freud conjectured, a group of less powerful sons had banded together to kill the father who had dominated or expelled them, and their subsequent guilt over this crime led them to create the first law of human civilization: the prohibitions against murder and incest.[19] The child's passage through the Oedipal stage, for Freud, recapitulates and helps to decode this ancient transition from human as primal animal to human as subject of law and religion.[20] The originary desires to kill the father and sexually possess the mother must be repressed, the taboos against patricide and incest established, in order for the individual and the species to become truly human.

For Freud, the crucial stages in that journey are those that repress the animal self, which encompasses the drives of sex and aggression, in favor of the mores of civilization. Yet the primitive animal self remains potent in the unconscious, resurfacing in dreams, art, and neuroses.

[16] Beer, *Darwin's Plots*, 13.
[17] Rohman, *Stalking the Subject*, 6–7.
[18] Sigmund Freud, *Totem and Taboo* [1913], transl. James Strachey (W.W. Norton, 1950), 155–6.
[19] Ibid., 176–81.
[20] Ibid., 178.

In *Civilization and Its Discontents* (1930), Freud uses animal imagery to argue that the repressed instinct of aggression continues to pose a threat to human civilization. "[M]en are not gentle creatures who want to be loved, and who at the most can defend themselves if they are attacked," he claims; "they are, on the contrary, creatures among whose instinctual endowments is to be reckoned a powerful share of aggressiveness … *Homo homini lupus*" – man is wolf to man.[21]

Freud understood the human as essentially conflicted, torn between the primitive animal unconscious and the demands of civilization, internalized as the superego. This understanding offers extensive insight into the writings of Lawrence, Wells, and many of their contemporaries, and it has been deftly explored within the field of modernist animal studies, particularly in Rohman's *Stalking the Subject* and Philip J. Armstrong's *What Animals Mean in the Fiction of Modernity*. However, while Freud's theory offers an extraordinarily influential account of human subjectivity, it has much less to say about the subjectivity of actual nonhuman animals. One can surmise from Freud only that animal subjectivity is dominated by the sexual and aggressive instincts, and that it is fundamentally different from human subjectivity in lacking the conflict introduced by civilization. Freud did express curiosity about nonhuman subjectivity, but only as an aside. "Why do our relatives, the animals, not exhibit any such cultural struggle?" he asks, speculating that perhaps "a temporary balance has been reached between the influences of their environment and the mutually contending instincts within them … There are a great many questions here to which as yet there is no answer."[22] Darwin's account of animal life in the *Descent* was much fuller. It examined animal subjectivity in the service of describing humans' lineage, but it did not reduce animals to a mere metaphor for the primitive parts of human nature.

To understand how the writers and scientists under study in this book conceived of animal subjectivity, the more important school of psychology is not Freud's but William James's. James, too, was a Darwinian, but his evolutionism took a different, more concrete, form than Freud's. James saw psychological traits as at root physical traits, theoretically reducible to actions of the brain and nervous system. The goal of psychology, he claimed in *The Principles of Psychology*, is to "[ascertain] the empirical correlation of the various sorts of thought or feeling with

[21] Sigmund Freud, *Civilization and Its Discontents* [1930], transl. James Strachey (W.W. Norton, 1961), 68–9.
[22] Ibid., 83.

definite conditions of the brain," taking a "strictly positivistic point of view."[23] The first chapter of *The Principles* focus on physiology and neuroscience, reflecting James's wish to disentangle psychology from metaphysics and make it scientific.

James believed that psychological traits evolved just as physical traits did, and that they existed in different forms and degrees throughout the animal kingdom. "It is very generally admitted," he wrote, "though the point would be hard to prove, that consciousness grows the more complex and intense the higher we rise in the animal kingdom. That of a man must exceed that of an oyster."[24] Though he uses the anthropocentric metric of "higher" and "lower" to rank animals, in fact James's theory suggests that the oyster's form of consciousness is just as well adapted to its form of life as the human's is to hers. As Mark Nielsen and R.H. Day point out, one of James's early lectures argued that the simple *Aplysia*, a sea slug without a cerebellum, is a fine example of evolutionary adaptation; James said that its nervous system is responsive "to few stimuli but to them strongly and well."[25] Other animals in other walks of life benefit from more complex forms of consciousness, which, according to James, allow them to select which sensations from the external environment to pay attention to: "consciousness is at all times primarily *a selecting agency* … choosing one out of several of the materials so presented to its notice, emphasizing and accentuating that and suppressing as far as possible all the rest."[26] Consciousness thus benefits the organism by allowing it to respond flexibly to small changes in its environment. In the claim that consciousness is evolutionarily *useful* and thus operates under the action of natural selection, James was making an innovative argument. Thomas H. Huxley, another follower of Darwin, had declared the opposite: that consciousness was an extra, a by-product of evolution but with no efficacy of its own. "We are conscious automata," he wrote, referring to both humans and nonhuman animals.[27] James, on the other hand, assumed that consciousness evolved because it served an adaptive purpose.

For T.H. Huxley, then, consciousness constitutes subjective experience but does not affect the workings of the body; for James,

[23] William James, *The Principles of Psychology*, vol. 1 (Henry Holt, 1890), vi.
[24] Ibid., 138.
[25] William James, *Manuscript Lectures* (Harvard University Press, 1988), 25; quoted in Mark Nielsen and R. H. Day, "William James and the Evolution of Consciousness," *Journal of Theoretical and Philosophical Psychology* 19.1 (1999): 90–113, quote on 100.
[26] James, *Principles of Psychology*, 1:139.
[27] Thomas H. Huxley, "On the Hypothesis that Animals are Automata, and Its History" [1874], in *The Huxley File*, ed. Charles Blinderman and David Joyce: alepho.clarku.edu/huxley/.