Introduction
Adaptive Appearance in Nineteenth-Century Culture

Appearances matter. Thus contended the naturalist Henry Walter Bates in 1861 when he delivered a paper to the Linnean Society of London on curious patterns of resemblance among Amazonian flora and fauna. Bates had spent eleven years in the country studying animals (particularly insects) that took on the aspects of vegetation, terrain or other species. His interest in such resemblances ran against a growing tendency in science to disregard nature's impressive qualities as superficial distractions. The emerging discourse of objectivity advocated mechanised methods of observation supposedly purged of personal perceptions.[1] The scalpel and microscope promised to pierce through illusions that tricked the casual eye. Yet, instead of expunging illusions from his evidence, Bates placed them centre-stage. 'These imitative resemblances', he wrote, 'are full of interest, and fill us with the greater astonishment the closer we investigate them; for some show a minute and palpably intentional likeness which is perfectly staggering'.[2] Such appearances, Bates suggested, were not trivial but vital clues to evolutionary history.

This point was demonstrated by the interspecies resemblances which Bates called *mimicry*. These resemblances seemed to occur when two species with common foes lived side by side and one possessed some defence such as a noxious taste. Bates argued that, as predators learned to avoid the defended species, they were also likely to avoid other creatures that resembled it. This dynamic created a selective pressure favouring the survival of individuals that imitated the model species to ever-greater degrees. There might have been more to life's forms than met the eye, but how they met the eye could be key to their survival. Organisms, Bates suggested, were at once physical beings and clusters of signs that prospered and perished depending on other organisms' perceptions of them.

Protective mimicry was one of a web of theories in the second half of the nineteenth century that framed appearance as a factor in environmental adaptation. Camouflage and mimicry (now known collectively as *crypsis*)

could also disguise predators to help them catch prey.[3] Mimicry depended on aposematism, that is, organisms signalling their defences via striking features.[4] In 1878, the German biologist Fritz Müller proposed that such warnings could also be mimetic. Species with similar defences, he claimed, evolved resemblances to each other to spread the cost of predators learning to avoid them (which often involved individuals being killed).[5] Charles Darwin had also argued in *On the Origin of Species* (1859) that many species developed conspicuous features to attract mates, rendering aesthetics a factor in adaptation.[6] Darwin highlighted the newly pronounced role of appearance in biology in an 1863 review of Bates's findings, commenting that, 'to the perplexity of naturalists . . . Nature [has] condescended to the tricks of the stage'.[7] His view was echoed by the co-discoverer of natural selection, Alfred Russel Wallace, who had studied crypsis alongside Bates. Many animals, Wallace reflected, seemed 'like actors or masqueraders dressed up and painted for amusement, or like swindlers endeavouring to pass themselves off for well-known and respectable members of society'.[8]

As Darwin's and Wallace's images show, these theories of crypsis, aposematism and sexual display (which I collectively term *adaptive appearance*) were highly suggestive, spurring Victorians and Edwardians to rethink many aspects of life. Natural historians had long noted examples of organisms concealing themselves, resembling other species and standing out through conspicuous features. However, an intensified focus on survival adaptation and a new view of nature as dynamic and evolving gave a new resonance to such appearances. Representations of adaptive appearance troubled emerging divisions between objective and subjective knowledge, inviting readers to imagine the world through other species' eyes. Christopher Herbert finds many Victorians entertaining the thought that the world was only knowable as differences and relations rather than things-in-themselves, rendering knowledge relative.[9] Adaptive appearance extended this relativism by collapsing distinctions between illusion and reality: biological existence, it implied, was permeated to its core by interpretation and contingencies of perception. Adaptive appearance also encouraged new approaches to human deception and display. If nature was theatrical, then perhaps the theatricality of society could also be understood as natural. Jane Goodall and Kirsten Shepherd-Barr note that nineteenth-century drama could highlight the performativity of evolution through the physical-semiotic interactions of actors' bodies in the 'environment' of the stage.[10] I suggest that adaptive appearance further encouraged Victorians and Edwardians to reconceptualise human deceit, rhetoric and

self-presentation as biological phenomena rather than moral choices. Adaptive appearance came to serve as a vehicle for burgeoning uncertainties about the role of signification in nature, the human/animal divide, the place of deceit in human evolution, and the possibility of individual agency and authentic identity.

I will trace how adaptive appearance mediated these tensions through a combination of cultural history and literary criticism, modelled on the pioneering work of Gillian Beer, George Levine, Sally Shuttleworth and Laura Otis.[11] Adaptive appearance was not just scientific theories but what Beer has called a 'shared discourse' of 'metaphors, myths and narrative patterns' that traversed scientific and non-scientific communities.[12] *Mimicry and Display* has no truck with views of science in culture as a one-way dissemination from expert-originators to passive audiences. It views adaptive appearance as a pliable set of images and concepts that were reshaped to suit different perspectives and agendas, much like evolution in general.[13] Greg Garrard defines ecocriticism as the rhetorical analysis of 'ways of imagining, constructing or presenting nature in a figure' or 'trope'.[14] I identify adaptive appearance as a cluster of such 'tropes' (namely mimicry, camouflage and conspicuous display) which circulated unpredictably through late nineteenth- and early twentieth-century Anglophone culture with myriad connotations. Like the organisms that inspired it, adaptive appearance signified different things to different perceivers, from divine presence to a Godless world, progress to degeneration, creative individuality to mindless conformity.

Ecocriticism is further characterised as part of an avowedly environmentalist and animal-liberationist politics that critiques anthropocentrism and seeks alternative, 'posthuman' ways of conceptualising life.[15] A subfield of such critical theory adopts the linguistic-biological terminology of *biosemiotics* and *zoosemiotics* to challenge traditional binaries between mindful, human semiosis and mindless, non-human mechanism. At the same time, some theorists advocate a framework of *zoopoetics*, which, by questioning the construction of art or literature as exclusively human activities, attacks oppositions between mindful humans and mechanical non-humans.[16] *Mimicry and Display* engages tentatively with these discussions by showing that discourse of adaptive appearance in the long nineteenth century could undermine such binaries and, thus, seem to anticipate the political resonances of contemporary bio- or zoosemiotics. For authors such as Grant Allen and Thomas Hardy, adaptive appearance also cohered with wider critiques of capitalism and biological essentialism. Jerome McGann argued that Romantic ideals of the transcendent power of the imagination

obstructed progressive politics by downplaying life's material conditions.[17] By contrast, adaptive appearance could support a thoroughly materialist account of the mind, folding society, culture and biology into a single, dynamic whole characterised by contingency and potential change.

However, I am wary of smoothing out the complexities of the past by forcing it into teleological political metanarratives. Adaptive appearance certainly problematised human/non-human binaries, but this was not necessarily accompanied by an expanded sense of ethical responsibility toward non-humans. Imagining animals as sign-makers and interpreters inspired some Victorians to reinstate divisions between humans and non-humans (and, indeed, between different human groups) by hierarchising semiosis into ascending levels of mindedness. *Mimicry and Display* thus challenges the assumption that extending semiosis to non-humans necessarily extends agency and personhood to them as well. Indeed, I show that adaptive appearance could even deprive humans of these capacities, absorbing them into economies of advertisement and deception the same as non-humans. This perspective sometimes tended toward political pessimism, framing human behaviour as the inevitable product of fixed, amoral biology. Further, as Chapter 5 shows, conceptualising human society through the lens of adaptive appearance led some to regard the manipulation of the masses by elites as unavoidable and perhaps even desirable. Insofar, then, as this study contributes to an ecocritical (or, indeed, any progressive) politics, it shows that bio- or zoosemiotic discourse is not an automatic ally of such politics, and can bolster oppressive structures as well as resisting them.

English literature has long depicted human dissembling and dishonesty with metaphoric figures of chameleons and other elusive animals.[18] However, I argue that literary appropriations of adaptive appearance in the Victorian and Edwardian periods represented more than just updates of old metaphors. Beer notes that, through its revelation of common ancestry, evolutionary theory functioned 'to substantiate metaphor and particularly to find a real place in the material order for older mythological expression'.[19] Similarly, when applied to people, adaptive appearance could turn old metaphors into newly literal realities, suggesting that humans were embedded in the same dynamics of deception and display as their animal cousins.

At the same time, I recognise that scientific and literary or artistic communities defined themselves according to different goals, and developed different methods and identities, sometimes in conscious opposition to each other. Like Anne DeWitt, I view late nineteenth-century

science and literature as not just overlapping activities but also tectonic tensions between rival, shifting centres of authority.[20] Some of this study's protagonists (notably Charles Kingsley and Abbott Handerson Thayer) often seem more concerned with defending or expanding their territories of expertise than uniting in a utopian 'one culture' of interdisciplinarity.[21] Adaptive appearance is particularly suited to interdisciplinary analysis since its theory and practice necessarily blurred the boundaries between science and the arts. However, this lineality could also problematise its status as oppositional models of art and science gained influence toward the end of the century (see Chapter 1).

I suggest that, as a shared discourse, adaptive appearance interacted with certain literary forms. Caroline Levine, Charlotte Sleigh, Peter Garratt and Adelene Buckland have analysed Victorian realism as a response to scientific epistemologies, characterised by doubt, uncertainty and epistemic modesty.[22] Catherine Gallagher further portrays Victorian realism as a dynamic tension between the rival truth claims of the typical and the particular.[23] Recently, Pamela Gilbert has argued that Victorian realism co-developed with a new emphasis on bodily surfaces as foci of identity and subjectivity, 'posited at once as radically transparent to interpretation and as obscure'.[24] I submit that natural historians' representations of adaptive appearance reflected these tendencies, critiquing their impressions of nature in a manner reminiscent of John Ruskin's theories of artistic vision. Such representations also depended on conventions of natural-historical memoir, which combined systematic data-gathering with personal anecdote and aesthetic impressions. I argue that novelists such as Allen and Hardy similarly foregrounded the unreliability of perception with various narration devices, and promoted the virtue of interpretive restraint through plots involving adaptive appearance. Equally, such tales could frame generic conventions such as poetic justice as deceptions to be exposed similarly as science penetrated the deceptions of animals. I claim that adaptive appearance existed in tension (at least in Hardy's fiction) with pastoral tradition, which tended to construct nature as honest and transparent. I also show that adaptive appearance could undermine detective fiction's conventional faith in the power of science to unmask deceptions. Further, I suggest that the biology of appearance energised cultural criticism that conceived of culture in biological terms.

Although the literary and cultural contexts of crypsis and aposematism in the nineteenth century have been relatively neglected by scholars, this study builds on and responds to works concerned with science and appearance more generally.[25] Sexual selection has received more sustained

attention, with scholars exploring how this concept reshaped aesthetic experiences as material, transspecies phenomena.[26] *Mimicry and Display* argues that scientific naturalism similarly materialised deception and semiosis as activities that linked humans to animals instead of separating them. I expand on Margot Norris's claims that Darwinism influenced Modernist notions of mimesis, applying her concept of 'mimeophobia' to Victorian texts.[27] Sleigh has shown that studies of ants in the twentieth century evolved in dialogue with theories of communication such as semiotics and cybernetics.[28] I suggest that such discourse of communication-as-biology, and its problematisations of intentionality and individuality, were prefigured by nineteenth-century discourse of adaptive appearance. Srdjan Smajić and Martin Willis have highlighted Victorians' awareness of the hazards of inference, and I argue that adaptive appearance was built upon such problematising of perception.[29] I draw on Jonathan Smith's and George Levine's studies of Ruskin's opposition to Darwinism, but I also complicate this opposition.[30] Although Ruskin reviled materialism, I argue that his notion of apprehending nature 'innocently' unwittingly set a template for later representations of adaptive appearance. Anne Helmreich has shown that ideas of 'truth to nature' transformed through the nineteenth century as the virtues of accuracy and precision gave way to subjective impressionism, redrawing relations between art and science.[31] I contend that adaptive appearance contributed to this complication of natural truth, highlighting the importance of failures and partialities of perception in nature's economy. Tiffany Watt-Smith observes that the ideal of restrained, objective observation in the period was countered by physiologically responsive forms of scientific looking, notably in vivisection and psychology.[32] I extend her argument, suggesting that, in the case of adaptive appearance, embodied perception acted as a tool of interspecies empathy. The radical implications of adaptive appearance derived from its approach to the non-human world as a space of rhetoric and interpretation, so I will first sketch how this approach developed, before outlining its significance for human life.

Nature's Rhetoric and Primitive Interpretation

The framing of nature as rhetorical can be seen in the ways that researchers and popularisers of adaptive appearance evoked it. In 1897, the zoologist Edward Bagnall Poulton distinguished Bates's and Müller's theories of mimicry in terms of commercial branding. As mentioned previously, Batesian mimicry involved defenceless species passing themselves off as

better-defended ones, while, in Müllerian mimicry, species with equal defences resembled each other to spread the cost of communicating their unpalatability to their foes. Hence, Poulton wrote that, in Batesian mimicry, the relation between mimic and model species 'may be compared to that existing between a successful well-known firm and another small unscrupulous one which lives upon its reputation'. Conversely, in Müllerian mimicry, 'the relation may be compared to that between two successful firms which combine to use a common advertisement'.[33] At around the same time, the science writer and novelist Grant Allen was also emphasising nature's manipulativeness, writing,

> Human life and especially human warfare are rich in deceptions, wiles, and stratagems . . . Trade in like manner is full of shams . . . But Nature we are usually accustomed to consider as innocent and truthful. Alas, too trustfully: for Nature too is a gay deceiver. There is hardly a device invented by man which she has not anticipated: hardly a trick or ruse in his stock of wiles which she did not find out for herself long before he showed her.[34]

Allen's gendered language draws on long-standing associations between femininity and dishonesty, presenting adaptive appearance as a shocking blow to nature's supposed moral purity and authenticity. Rousseauian celebrations of nature as unmediated presence and goodness seem to have abruptly given way to Machiavellian skulduggery.

Yet Allen's vision of an innocent natural world destroyed by Darwinian adaptive appearance was somewhat exaggerated. Appearance had long been recognised as having at least some role in non-human life. The famous dictum 'Nature loves to hide' descended from Heraclitus, while Pliny the Elder had noted examples of animal camouflage.[35] Ancient ideas of animals possessing cunning were symbiotic with observations of seemingly deceptive behaviour such as foxes hiding in their dens.[36] In the late eighteenth century, Christian Konrad Sprengel had argued (although with little impact) that flowers' eye-catching colours served to attract insects, which aided fertilisation.[37] Charles Darwin's grandfather Erasmus observed that 'the colours of many animals seem adapted to their purposes of concealing themselves'.[38] Early nineteenth-century naturalists were well aware of resemblances between unrelated species, although they usually called these resemblances 'analogies' instead of mimicries. What changed between then and the time of Bates and Poulton was less the kind of data being collected than how it was interpreted.[39]

Pre-Victorian researchers often presented interspecies resemblances as a kind of divine decoration, signalling an intelligent creator. William Sharp Macleay argued that resemblances between species of different taxa

followed regular patterns. His quinarian system assumed that morphologically similar species occurred in rings of five, which overlapped symmetrically with other rings of kindred species. Such symmetry could be imagined as evidence of intelligent design, as in William Paley's comparison of the organic world to a watch, too perfect to have come about by chance.[40] However, zoologists increasingly doubted quinarianism toward the mid-century as examples mounted of species varying erratically. Prior to Darwin's evolutionary tree, asymmetrical 'maps' of species were replacing Macleay's rings.[41] Anthropocentric natural theology was giving way to a more ecocentric natural history that focussed on how organisms' traits adapted them for survival. This ecocentric orientation shifted the focus away from humans' aesthetic responses to nature and toward organisms' probable perceptions of each other.

Such ecocentrism undermined the tradition not only of admiring nature as divine art but also of regarding it as a legible text of the creator's mind. Notions of the 'book of Nature' had long figured organisms as moral allegories.[42] Although this symbolic view lost much of its potency through the Enlightenment, mild versions of it persisted into the nineteenth century. In 1824, for example, the entomologist John Oliver French described nature as 'a boundless theatre, in which moral and intellectual agency is ever active and employed'. The appearances and instincts of animals, he claimed, acted as 'a mirror' 'in which the various moral and intellectual powers of man are symbolically reflected', from 'industry, integrity, justice and order' to 'dishonesty, injustice ... selfishness and cowardice'.[43]

Susan Lorsch claims that Victorian culture witnessed a 'designification' of nature as secular science progressively emptied it of such spiritual meaning.[44] I argue that the change was more complex. Nature was not simply voided of significance; rather, signification was reduced to a material process within nature instead of being a spiritual process external to it. Rather than constituting a coherent statement of divine values, the world fragmented into a cacophony of signs and interpretations between organisms, which were bound up with the business of survival and reproduction. Chapter 2 explores this disturbance to divine nature symbolism through the parson-naturalist Charles Kingsley's engagements with adaptive appearance. Kingsley struggled to reconcile the phenomenon with his faith that nature expressed God's personality and instructions. His efforts to control nature's significations show that adaptive appearances interacted with wider anxieties in the period about the variability of interpretation and instability of meaning.

The construction of nature as rhetorical placed its appearances on a spectrum with other forms of communication, culminating in human language. The sense of commonality between human and non-human communication was further aided by philosophers increasingly locating meaning in receivers' interpretations instead of senders' intentions. The ancient art of rhetoric approached language as a means of eliciting audience responses, but this had not usually been regarded as the essence of communication. John Locke had depicted words and, by extension, all signs, as arbitrary markers of thought which people used to transmit their ideas to each other.[45] Signs and the exchange of meanings (including deceitful ones) seemed to be primarily purposeful acts of transmission. However, the emergence of historical philology undermined this logic, showing that languages evolved through deep time regardless of human intentions. Humans seemed moulded by the specific histories of their mother-tongues, which were held to embody and shape unique national characters.[46] This new outlook rendered translation a matter of indefinite approximations between different collective experiences; and perhaps what applied on the national level also applied to individuals.

The logician Benjamin Humphrey Smart elaborated this point in *An Outline of Sematology* (1831), asserting that communication consisted not of transmitting one's thoughts outward but of 'touch[ing] the chords' and 'awaken[ing] the associations' in others. Rejecting the claim that rhetorical devices, or 'expedients', as he called them, were simply 'instruments of deception', Smart declared: 'It is only by expedients that mind can unfold itself to mind . . . there is no such thing as an express and direct image of thought'.[47] He argued that speakers ascribed meanings to words through the contexts in which they heard them used, rendering signification associative and receiver-focussed. Language functioned, Smart concluded, 'rather to put other minds into a certain posture or train of thinking, than pretend to convey at once what the speaker thinks'.[48] Theories of adaptive appearance were similarly receiver-focussed. Wallace explained in 1867 that the term 'mimicry' denoted not 'the sense of voluntary imitation' but 'a particular kind of resemblance only . . . As this kind of resemblance has the same effect as voluntary imitation or mimicry, and as there is no word in the language that expresses the required meaning, "mimicry" was adopted.'[49] Insect mimicry had struck Bates as 'palpably intentional'. Yet, similarly as Darwinism obviated the origin of a creator for the world, adaptive appearance obviated the origin of an intentional agent for signs, true or false.

Shifting the emphasis in signification from intention to reception placed humans and animals on a semiotic continuum. Smart claimed that

beneath artificial language there was a 'Rhetoric of nature, namely, tone, looks, and gesture', as well as 'the inarticulate cries of the mere animal'.[50] Similar thinking underlay Henry Lord Brougham's observation that animals 'seem to have some knowledge of conventional signs. If I am to teach a dog or a pig to do certain things on a given signal, the process I take to be this. I connect his obedience with reward, his disobedience with punishment.'[51] The young Charles Darwin read both of these authors in the late 1830s when he was first working out his theory of evolution (and, aptly, worrying about how it might be received). Darwin's notes praised Smart's and Brougham's insights, and their influence can be seen in his later arguments that language had grown out of animal communication, and that humans shared a repertoire of emotional expressions with animals.[52] However, as Smart and Brougham had made clear, the crux of semiosis lay in interpreting signs rather than producing them. Hence, Darwin argued in *The Descent of Man* (1871), non-linguistic beings could still reason as they learned to interpret the world around them. 'Animals', he wrote, 'may constantly be seen to pause, deliberate, and resolve'.[53] Humans and animals could be conceptualised as fellow-interpreters of the world.

This view legitimised efforts to imagine the mental worlds that other species inhabited. From Lockean sensationalism, it followed that the closer animals were to humans anatomically, the more similar their nervous systems and, so, their mental lives would be. 'We are perfectly justified', Alexander Bain wrote in 1850, 'in conceiving of the feelings engendered in a flying bird, a cantering horse, or by the loiterings of a flock of sheep; our own bodily states can approach sufficiently near to any of these to enable us to form some estimate of the resulting sensations'.[54] Bain argued that the homology of the 'organs of sense' between vertebrate animals supported the inference that 'the outer world must impress the sentient organs in very nearly the same way'. Animals learned to associate these sensations with consequences, enabling them to be deceived, as Bain commented: 'the animal tribes, no less than humanity itself, come to know a whole class of things from a single specimen . . . Both man and brute are liable to be misled by apparent similarities, and to miss such as are real.'[55]

Bain's levelling of human and animal perceptions recalls W. J. T. Mitchell's insight that depictions of animals being deceived have often emphasised these creatures' similarities to humans. Mitchell cites an anecdote in Pliny's *Natural History* in which birds fly at a painting of grapes, mistaking the image for real fruit. He notes that 'Pliny presents "being taken in" as consistent with a kind of judgment', a capacity for 'verdict