

TEXTS · IN · CULTURE

Charles Darwin's
THE ORIGIN
OF SPECIES

New interdisciplinary essays

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Manchester University Press
Manchester and New York

*distributed exclusively in the USA
and Canada by St Martin's Press*

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Introduction: difficulty and defamiliarisation—language and process in *The Origin of Species*

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Defamiliarisations

By the spring of 1838, Charles Darwin seemed well aware of the revolutionary potential of his developing materialist theories of nature, though expressing that awareness – even to himself – in characteristically hesitant fashion. ‘Mention’, he wrote in his transmutation notebook C, ‘persecution of early Astronomers, then add chief good of individual scientific men is to push their science a few years in advance only of their age...’¹ Over twenty years later, in the third edition of the *Origin*, this instruction came to fruition via an insertion made in one of the text’s most memorable passages: that suggesting the possibility of the eye, in its complexity and apparent perfection, having been formed by the process of natural selection rather than by an act of Divine creation. Having freely confessed that this proposition would seem ‘absurd in the highest possible degree’, Darwin nevertheless interposed: ‘When it was first said that the sun stood still and the world turned round, the common sense of mankind declared the doctrine false; but the old saying of *Vox populi, vox Dei*, as every philosopher knows, can never be trusted in science.’²

It is significant enough that in these instances Darwin chose to align himself with figures, such as Galileo, who had initiated

irrevocable changes in cosmological thinking. This helps to complicate the long-received image of a man so overburdened with timidity and humility that the defence of his theories had largely to be conducted by others. But of equal significance is a particular representation of the nature of scientific revolutions and, by extension, of the manner in which scientific knowledges might exert their general influence. Cosmologies become transformed into a 'common sense', held by 'mankind', which can then only be shattered by a science willing to confront popular opinion with the 'absurd.'

In fact, as a mid-nineteenth-century natural scientist, Darwin's relation to notions of 'common sense' was a contradictory one, reflecting the complex transformations occurring within 'science' both as an ideology and as a set of practices and institutions in British culture. It has been argued, with particular reference to the founding of the British Association for the Advancement of Science in 1831, that the word 'science' took on new and narrower meanings in the 1830s and 1840s, ceasing to be a synonym for all knowledge and becoming instead the definition of a specific and allegedly more powerful mode of understanding.³ This coincides with a process of professionalisation which gained momentum throughout the Victorian period. Yet it remained crucial for the ideological maintenance of that power for science to retain a kind of invisibility – to continue to appear not as the instrument of bourgeois hegemony it was becoming but, in the words of its most prominent practitioners and popularisers, as 'nothing but *trained and organized common sense*' (T. H. Huxley) or 'simply a higher development of common knowledge' (Herbert Spencer).

The Origin of Species (1859) exhibits this tension between the familiar and the absurd, tradition and revolution, in its own form. Led by a mingled tone of painstaking honesty, caution and self-criticism, it is not impossible to read the *Origin* as a humble enquiry, paradoxically deriving its astonishing facts and conclusions from a method of empirical observation which the layman would adopt as a matter of course. At the same time, however, the text issues frequent reminders that its reception is dependent upon a decisive epistemological break or paradigm shift. Darwin's readers would need to be jolted out of their

'common-sense' complacencies, whether these took the form of that 'familiarity' which 'alone prevents our seeing how universally and largely the minds of our domestic animals have been modified by domestication' (p. 240), or of the 'load of prejudice' and 'blindness of preconceived opinion' which in the final 'Recapitulation and Conclusion' chapter are taken to characterise the widespread opposition to theories of the mutability of species. Such opposition, it should be noted, is here seen to reside within the established scientific community; Darwin's greatest hopes for the success of the *Origin* lay in the educated general public for whom it was orientated and in the generation of 'young and rising naturalists' whose minds were yet resistant to the hardening of creationist dogma (pp. 453–4). But the model of scientific world-pictures, assuming a notion of influence which pervades universalised entities such as 'mankind', can effectively subsume such specificities, and has certainly carried over into writing about the *Origin* itself. Thus, Ernst Mayr writes in the introduction to his 1966 edition of the text that 'every modern discussion of man's future, the population explosion, the struggle for existence, the purpose of man and the universe, and man's place in nature rests on Darwin'.⁵ Mayr's important work lies firmly within a heroic mode which is familiar in Darwin criticism.

How appropriate are these models of influence for representing the enormous significance of a text like Darwin's *Origin*? How useful are they for exploring the complex and varied impacts of the text within a particular culture or cultures? Perhaps any fresh approach to the *Origin*, such as this volume of essays seeks to adopt, should start with the same kind of process of defamiliarisation, both of the text and of its cultural status, as Darwin himself hoped to achieve with his work. As the Russian Formalist critics of the early twentieth century maintained, habitualised perception prevents us from seeing things as they are. Faced with the most commonly abbreviated forms of the text's lengthy title, *The Origin of Species* or, more familiarly within intellectual life, the *Origin*, we may need to confront a process of linguistic naturalisation by reminding ourselves that Darwin's text is about the *origin of species*.

Or is it? One recent authority has suggested that, had

Darwin published his best-known book under its existing title today, 'he would have been in trouble under the Trades Descriptions Act', because, 'if there is one thing which the *Origin* is not about, it is the origin of species. Darwin knew nothing about genetics.'⁶ This provocative observation reminds us that we should not be completely misled by the second part of the text's main title, 'by Means of Natural Selection'. While the theory, or metaphor, of natural selection as a mechanism of species-generation was clearly the central and most revolutionary proposal of the text, it was not the only form of species-generation, as Darwin was all too ready to admit. Natural selection was the 'steady accumulation' and preservation of differences beneficial to individual organisms in the 'struggle for life', eventually giving rise to the emergence of new species – an external process working on internal variations across countless generations. Such variations are rooted in 'the strong principle of inheritance', but the laws governing inheritance remained 'quite unknown' (p. 76). It has thus remained customary (though, as Robert Young has pointed out, somewhat 'crude and anachronistic' in the light of Darwin's work as a whole) to view the *Origin* as existing in a state of anticipation, awaiting Gregor Mendel's discoveries of 1863, though yet having to wait until the early twentieth century for the full revelation of those discoveries, when a new synthesis of knowledge could be produced to revive the by-now flagging fortunes of Darwinian natural selection as a theory for explaining evolutionary change.⁷

To prise Darwin's title out of its self-evidence and look at it afresh is thus to expose ambiguities. To the previous considerations we can add two further, and apparently polarised, senses in which the word 'origin' might signify within the text. First, if the *Origin* is not about genetic origin, then neither is it about the origin of life itself, upon which the development of species is clearly predicated. While Darwin felt compelled to challenge the principles of independent species-creationism with a concept of 'the laws impressed upon matter by the Creator', determining production and extinction through 'secondary causes', the issue of an ultimate beginning for species inevitably impinged upon his project in the *Origin*. In the final chapter of the first edition, the issue is approached with a

caution which verges on indecision and contradiction: the belief that 'animals have descended from at most only four or five progenitors, and plants from an equal or lesser number', is swiftly but hesitantly modified to allow the inference 'from analogy' that 'probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed' (pp. 454–5). Perhaps appropriately, the closing lines of the work refer to life, 'with its several powers, having been originally breathed into a few forms or into one...' (pp. 459–60). In subsequent editions there is some tinkering with these lines, including the attempt to suggest of the inference concerning one primordial originary form that 'it is immaterial whether or not it be accepted'. Darwin was later to regret what he called the 'truckling to opinion' implicit in his reluctant broaching of such issues; yet it was perhaps disingenuous to claim that the text simply had 'nothing to do' with the origin of life itself (p. 234). Predictably enough, creationist critics exploited his hesitancy over the creation of one or several original forms; as Thomas Wollaston argued:

To our mind, the wonder consists in the act *at all*, and not in the number of times that it may have been repeated: for a Being that *can create* may surely do so as often as he pleases; and we have no right therefore to limit that act, – at any rate on the question of its *probability*; for, if we admit that it has been exerted so much as once, there is no *a priori* reason why it should not have been a million times repeated, or why, if he had so willed it, it might not, at some period or other, have been in constant operation.⁹

Howard Gruber's view that 'by avoiding the issue of the origin of life, the *Origin of Species* gains in simplicity what it loses in scope' therefore needs some revising.¹⁰ Wollaston's objection is not just a reasonable response to the logical frailty of this aspect of the text; it is also a useful indication that Darwin could not draw up his own interpretative parameters for the *Origin*.

In this light, there may be only one sense in which we can state unequivocally that the *Origin* is about the origin of species. According to this view, the 'origin' lies neither in the power of a Creator, nor in material genetic changes within organisms, but in the human systems of taxonomy, and there-

fore of language, which define 'species' – a concept of species which is 'morphological' rather than 'biological', at the same time expressing Darwin's distance from the practice of 'speciesism' *per se*. The key to this lies in Darwin's admission that:

I look at the term species, as one arbitrarily given for the sake of convenience to a set of individuals closely resembling each other, and that it does not essentially differ from the term variety, which is given to less distinct and more fluctuating forms. The term variety, again, in comparison with mere individual differences, is also applied arbitrarily, and for mere convenience sake. (p. 108)

'Does not essentially differ' here embodies the radical challenge posed by the *Origin* to the possibility of defining species in either of the two senses previously discussed. To assert as much is, of course, to do a kind of hermeneutic violence to Darwin's intentions: the *Origin* is not a work of linguistic philosophy, and Darwin was not in any explicit sense committed to dissolving the question of the origin of species into semantic relativity. For him, the effort was to make categorisation coincide with complex but actual existences and developments in nature.¹¹ Yet in noting his belief that 'species come to be tolerably well-defined objects' (p. 210), we must register a crucial element of vagueness. Increasingly, commentators have cited various forms of textual ambiguity as a basis for claims of a momentous revolutionary significance – for example, as the precise means by which Darwin in the *Origin* effectively problematised the relationship between human knowledge and the material world, and sought to deconstruct the essentialism underpinning the metaphysics of Western culture.

These initial 'defamiliarisations' bring us to the limits of the analogy with Formalist poetics: while helping us to see the *Origin* anew, they also reveal that there no thing itself to which defamiliarisation can give us access – no 'stone' to be seen in its original 'stoniness'.¹² Even if it is true, as Loewenberg usefully suggests, that in the *Origin* 'the word "origin" was never used in its sense of "beginning"; it always implied changes in the development of life-forms already in existence', neither Darwin's text nor his culture could allow him to limit the word thus.¹³ Nor can Loewenberg deduce from his point the more general thesis that 'Darwin was rarely inhibited by epistemo-

logical reservations'.¹⁴ On the contrary, epistemological uncertainty was central to an already-fertile discourse of evolutionary debate into which the *Origin* inevitably stepped: the pervasive interpenetration of the philosophical, ideological and religious with the scientific in this discourse makes attempts to fix the *Origin* as a work unclouded by doubt, metaphysics or linguistic ambiguity look like the bizarre effect of a subsequent academic culture itself obsessed with disciplinary essences.

Darwin criticism has nevertheless been overburdened by variations on the search for a purified, essential thing-in-itself. In some studies, we look over Darwin's shoulder as he annotates the margins of his reading, in an attempt to deduce the processes actually taking place at that time.¹⁵ Such analysis is, of course, an inevitable product of the vast stock of Darwin papers now collected in the Darwin Archive at Cambridge University, giving rise to an extensive literature enabling us to reconstruct in some detail the psychological and intellectual formation of Darwin's thought from his return from the *Beagle* voyage in 1837 to the first publication of the *Origin* and beyond. Re-entering the arena of Darwin studies in 1982 after a decade's absence, Robert M. Young observed: '[S]cholars are looking deeper and deeper and in greater and greater detail into the minutiae of Darwin's notes and thought processes. What is it that we wish to find there? Is it the key to genius? Why is a higher and higher power microscope applied to rethinking the thoughts of the "great"?'¹⁶

Young's questions are important. In an ideal world, such studies could co-exist happily alongside more 'externalist' studies of Darwin's texts and their varying cultural interpretations. But all too often, the tendency either in the studies themselves or in our reading of them has been to view the establishing of an accurate picture of Darwin's mental landscape as a corrective to the inherently precarious condition of a textuality which can somehow never quite transcribe the presence and plenitude of thought. In the next two sections of this chapter, I want to address two kinds of perceived threat to the purity or integrity of Darwin's *Origin*. First I will consider the way in which debates around 'Social Darwinism' highlight the methodological issues and anxieties surrounding the attribution of a political

position to Darwin and/or the *Origin*. Then I want to question the tendency to isolate the text as a single and radically discontinuous act, principally by surveying the history of its successive editions. Finally, in exploring particular aspects of the form and reception of the *Origin*, I want to indicate how difficulty and uncertainty – prerequisites of a defamiliarised perspective – are built into the fabric of its language and are thus integral to what David Amigoni calls its 'epistemology of representation'.

Cumulatively, I want to suggest a sense of the problems posed for any understanding of the *Origin's* cultural impact by reducing the text to the hypostatised expression of Darwin's scientific mind. Elsewhere in this volume, Fiona Erskine points to the contradictory readings which emerge as the *Origin* is disseminated across the late-nineteenth-century field of debate over gender and emancipation. Dermot Killingley's survey of Indian culture and Hindu theology in the same period reveals an equally complex process of appropriation, within which the specificity of texts matters less than the legitimating power of Darwin's name in conjunction with a cultural encounter of great indeterminacy. By contrast, Kate Flint examines mediation and transformation in the more precise context of the encounter between Darwinian science and Charles Dickens's writing of *Great Expectations*. 'Defamiliarisation' in these senses leads us to see the text as a cultural process, in which formation involves complex patterns of influence, reception implies a constantly shifting encounter between text and readers, and in which textual form itself constitutes a provisional realisation perpetually dissolving under the gaze of historians, scientists, the broader readership which the *Origin*, since its publication, has always enjoyed – and of Darwin himself.

Political Darwin or Social Darwinism?

James Moore, one of the most important recent figures in a tradition of articulating Darwin's work as a social and political phenomenon, has been able to identify the power of the impulse to 'purify' his subject by reflecting on his own attempt to 'launder Darwin's language' in his earlier work, *The Post-Darwinian Controversies* (1979). It is not coincidental that, in a

text which attempts to save Darwin from various misrepresentations and thus to exculpate him from the ideological taints of Social Darwinism (even in the nuanced form of declaring that 'Darwin was not a social Darwinist in any straightforward or unambiguous sense'), Moore should lay claim to having located 'at least one passage in the *Origin of Species* that remained substantially unaltered throughout the book's six editions (1859–72)', and which therefore – though Moore might now dispute this implied logic – 'distills the essence of Darwinism into less than five hundred words'.¹⁷ Here, a welcome moment of textual stability is used to guarantee the very notion of an 'essence' of Darwinism which can affirm a stability in the real thought of Darwin the individual and protect both text and thought from subsequent misappropriations. This 'essence', then, simultaneously protects Darwin's thought from the vagaries of textual change and reception, and protects science from politics.

Moore's strategy differs somewhat from Valentino Gerratana's observation that in Darwin we encounter a 'mind ... virtually devoid of economics and philosophy'.¹⁸ Yet they coincide, both in terms of the theoretical construct of the pure empirical scientist which haunts their accounts and in terms of that tradition, outlined earlier, of speculations on the contents of Darwin's mind. Since Gerratana's essay in 1973, and even before, research into Darwin's intellectual formation can be said to have discredited his view. But such knowledge does not fully account for a question which his comment continues to beg: what kind of relationship do we need to assume between the contents of Darwin's texts and the contents of his mind?

The language of the *Origin* suggests in fact that Darwin's mind was far from devoid of economics and philosophy. On the contrary, the theory of natural selection is consistently and explicitly cast as a theory of political economy in nature. The initial analogy between artificial and natural selection prepares the ground for this: discussions of breeding and cultivation are always closely related to the 'state of civilisation' of the society in question, and factors of human economic change such as land enclosure recur in Darwin's analysis of ecological balance. In the articulation of natural selection proper, the vocabulary

becomes more explicit, with the predication of a field of intense competition for places within a 'polity' or an 'economy of nature', or a 'natural economy of the country'. Unmistakably, the imputation of willed activity which Darwin seemed to find impossible to expunge from his representation is that of thrifty capitalist enterprise, where bees are 'anxious ... to save time' and natural selection itself 'continually trying to economise in every part of the organisation' (pp. 141 and 186). There is an effort to acknowledge that this discourse, while in some sense borrowed, has a substantial basis and pre-history in natural science – 'no naturalist doubts the advantage of what has been called the "physiological division of labour"' – while the dictum 'in order to spend on one side, nature is forced to economise on the other side' is traced to Goethe but also to Geoffroy Saint-Hilaire (pp. 141 and 185).

The spatial implications of Darwin's theory in the *Origin* also produce a discourse of territoriality which gives a more expansive feel to the principles of competitive economy. In speculating upon the progress of natural selection in a country undergoing climatic change, he notes: 'If the country were open upon its borders, new forms' (subsequently, 'intruders') 'would certainly immigrate, and this would seriously disturb the relations of some of the former inhabitants'; the impossibility of perfect adaptation means that natural selection will always have its work of improvement to do, for 'in all countries, the natives have been so far conquered by naturalised productions, that they have allowed foreigners to take firm possession of the land. And as foreigners have thus everywhere beaten some of the natives, we may safely conclude that the natives might have been modified with advantage, so as to have better resisted such intruders' (pp. 131–2). Thus in 'the great and complex battle of life', thrift and competitiveness in the domestic economy combines with the need for strong defensive policies of immigration control and a policy of rational imperial expansion, the 'naturalisation of plants through man's agency in foreign lands' acting as an analogy for this process. This 'war' necessitates strength in alien conditions: geological history is figured as military campaign, whereby 'the arctic and temperate productions will at a very late period have marched a little further

north, and subsequently have retreated to their present homes'; they will have 'been exposed to nearly the same climate' and will have 'kept in a body together' (pp. 361–2). Yet such strength is founded upon stability at home: in his 'little' experiments on a 'little' pond, Darwin's imagery is of the 'table-spoons' and the 'breakfast cup', in a section ending with nature characterised as a 'careful gardener', distributing her seeds in appropriate places. The discourses of war and domesticity may seem contrastive: but they could be said to gell perfectly at the level of Victorian bourgeois ideology.

A reading of the *Origin* thus makes it difficult to assert that Darwin's mind was 'devoid' of economics and philosophy. A more sustainable conclusion is that it was permeated by principles of political economy and philosophy in the form of a language which did not differentiate between the political and the biological. Here, in other words, we need a theory of language which incorporates a concept of the political or ideological unconscious, missing from Gerratana's account. Yet this remains problematic: if we describe the language of the *Origin* as inherently political, how far can we assume that Darwin was unaware of such a sub-text? And where does it leave the matter of 'placing' Darwin or the *Origin* in political terms?

In the light of his famous identification of a reading of Malthus's *Essay on the Principle of Population* (1798) as the key element in the precipitation of his theory of 'struggle for existence' – 'the doctrine of Malthus applied with manifold force to the whole animal and vegetable kingdoms' (p. 117) – it has been possible to relate Darwin quite explicitly to the dominant capitalist ideology of Victorian *laissez-faire* liberalism. Some definitions encourage us to see Darwin as a bourgeois scientist with either mildly conservative leanings – thus James Moore again, in 1979: 'Clearly, Darwin's world-view may be variously regarded as Christian, Victorian, Anglo-Saxon, capitalist, and middle-class. It forms the setting apart from which the theory of natural selection, and Darwin's theory of human evolution in particular, can hardly be understood' – or, in the case of Howard Gruber's gloss on Darwin's own definition of his position on the political spectrum as 'Liberal or Radical', as a 'radical' only in a strictly non-revolutionary sense:

[C]oncerned more with the preservation and extension of individual liberty than with the preservation of hallowed social institutions; concerned more with human rights than with property rights; favourably yet cautiously disposed towards social change; unattached to any organised group that would pursue the desired aims in a manner disturbing to the comfort and tranquility of upper-middle-class life.¹⁹

Yet, another glance at the trajectory of James Moore's work on Darwin indicates a significant shift in conceptualising the 'great man's' political identity. In Moore's 1985 essay, he presented a 'squarson-naturalist' Darwin poised between epochs, 'neither a clergyman *manqué* nor a professional scientist in the manner of his later-Victorian followers, but a sort of transformed "vicar" in the root sense of the word, the mediator of a struggling, improving, but law-bound nature to a struggling, improving but law-abiding society'.²⁰ In the recent biography, however, Moore and Adrian Desmond lay far greater emphasis on the depth of a Dissenting tradition in Darwin's formation, the prominence of radical materialist debate during the years of his scientific apprenticeship, and a consciousness of the deeply subversive implications of his own materialism which led to a 'double-life' symbolised in the secret transmutation notebook he began in 1837. To peer into Darwin's mind at this point is, for Moore and Desmond, to find a 'pandemonium', mirroring the turmoil of a country deep in recession and Chartist agitation, but drawing its internal energy from a theory which would transform the 'whole [of] metaphysics'.²¹

However much Darwin scholarship might strive to reconstruct the condition of his mind in the years before 1859, the *Origin* itself reveals, as I hope to show, the schizoid, contradictory position of 'my theory' within its culture, and more particularly its political culture, more pointedly than any such psychological speculations. As many commentators have noted in different ways, Darwin's language in the *Origin* is not so much his own as that of his culture: and again, not so much a unitary thing as a tapestry of discourses, borrowed or inherited, with varying degrees of mindfulness, from the evolutionism already evident in much social theory, from the Natural Theology the *Origin* is in other ways an answer to, from the

literature, perhaps of Shakespeare, and certainly of Milton, Dickens and Wordsworth, as well as from a common stock of rhetoric which he raided in order to make the text the object of popular consumption he wanted it to be.

In political terms, therefore, the language of the *Origin* acts out the struggle taking place within Darwin between the various contradictory impulses both feeding into and emanating from his theory of transmutation by natural selection. If the text voices the assumptions and sentiments of a bourgeois political economy founded on natural inequalities, it also embodies what Gillian Beer has called a 'levelling tendency', emphasising community and equality through the organic historical links between all life forms and their continuing ecological interdependence. If it gives biological validation to an individualist relativity, rooted in the critique of 'species' as Platonic abstraction and the crucial importance of individual differences in the struggle for life, it equally validates an overriding collectivity predicated upon the idea of the structured population as the basic functional unit of geographical space.

Such contradictions are not to be resolved in the imaginary space of Darwin's mind, or even in a consideration of his explicit political actions and positions (though these were complex and contradictory enough). They are, rather, the cultural material out of which his text was forged, and out of which a seemingly endless number of political or Social Darwinisms could be constructed. One reason for dissociating the *Origin* from its origin lies in Raymond Williams's suggestion that 'Darwin was much too humane a man to think in terms which were later to become possible — of the elimination of unfavourable variations, or of social policy in this conscious sense, to which he never fully applied himself' (and this despite the observation in the *Origin* that 'hardly anyone is so careless as to allow his worst animals to breed' (p. 91)).²² Yet Williams himself belongs to that group of critics on the Left of Darwin studies, along with Robert M. Young and James Moore, who have insisted on the always-already social nature of Darwin's work, and thus to the problems inherent in a term, Social Darwinism, predicated upon an initially guiltless scientific theory which is not or was not Social but which is capable of

being injected with the virus of ideology.

The work of these writers undeniably lays the foundations for our present volume. Yet there is a danger, perhaps most apparent in the polemical work of Young, of reinstating an unnecessarily strict dichotomy. Once the inescapably social and political nature of Darwinian theory is established, the function of that position need not be to discredit the value of 'Social Darwinism' in denoting a process of tailoring and appropriation which did undoubtedly occur. Spencer's synthetic philosophy and its enormous influence in late-nineteenth-century Britain and America, Galton's eugenics and the extension of this science into pre-war British policies and propaganda, or Thatcherite and Reaganite free-market liberalism in the 1980s, all benefited from naturalisations which could be derived from the theories, and even the name, of Darwin. In collapsing Social Darwinism into the formula 'Darwinism is Social', we risk losing the value of a formulation which identifies certain concrete and contentious uses of Darwin's work in the realms of policymaking and *realpolitik*, and which at the same time does not necessarily threaten the epistemological position that his work is inherently political. More precisely, the value of the term is perhaps to indicate how Darwin's work, with the *Origin* as its initial and most revolutionary public face, marked to an unprecedented extent the explicit incorporation of natural science into all kinds of value system within our cultures.

In, however, seeking to modify the force of Moore's assertion that 'The routine distinction between "Darwinism" and "Social Darwinism" would have been lost on the author of the *Descent of Man*, and probably on most of his defenders until the 1890s', we must acknowledge the innovatory importance of the essay from which it is taken. In 'Socialising Darwinism: Historiography and the Fortunes of a Phrase' (1986), Moore not only suggests that it is the pervasive presence of evolutionary discourse in contemporary Western life which constitutes the political force of Darwin's work; he also argues that Social Darwinism itself is an effect of discourse, 'invented as a problem for social theory in the 1890s, when it became a matter of urgency to pacify and contain the demands of labour in newly expanding and restructuring economies'.²³ Reified by academic

professionalisation and the accompanying fragmentation of disciplines and knowledges, Social Darwinism is for Moore 'an artefact of bourgeois perception':

The problem for radicals is ... to reconstruct the common context of language and assumptions in which biological and social theories once intermingled, in which Darwinism was Social (Young, 1985), and then to explain why this 'commons' was enclosed, how the language and assumptions were parcelled out among professional interests, and what impact this had on the masses of lay people who thereafter were barred from 'informed' debate on biological and social questions that affected their political destinies.²⁴

In the next two sections of this chapter, I want to concentrate on aspects of the form and language of the *Origin*, adopting Moore's position that it is language which constitutes the rich yet 'common context' of an influence which is at once scientific and cultural.

Text in process

The *Origin of Species* had, in the space of thirteen years, undergone a textual evolution. Variations, in the form of Darwin's changes, had appeared throughout the work in five successive editions. Despite the fact that each separate change was both a continuation of the general thesis, and consistent with it, it was nonetheless change. Consequently, just as in organic evolution, the cumulative result of a long, successive, and interrelated series of changes was a product no longer consistent with the original.

Peter J. Vorzimmer, 1970.²⁵

Only in one restricted sense could the *Origin* be said to constitute a distillation or essence of Darwin's work on transmutation theory up to 1859; namely, the literal sense in which the first edition of the text was an abstract of a larger abstract, written over a period of some eight months and precipitated by the necessity of declaring his findings alongside those of Alfred Wallace after the famous co-presentation of papers at the meeting of the Linnaean Society on 1 July 1858. Despite his often-noted struggle with linguistic expression, we should not be too quick to assume that the composition of the *Origin* placed

Darwin under unforeseen and intolerable pressure: many of the text's most significant polemical points and rhetorical structures had already been outlined in the sketches of 1842 and 1844; and if, as Desmond and Moore have recently stressed, the issue of publication and its perils had been prominent in Darwin's mind for some considerable time, it seems likely that a reservoir of potential devices and formulations would already be in place. Nevertheless, the first edition bears the marks of an author determined to convince his readership that distillation in this case meant an unsatisfactorily partial and even provisional demonstration of work either already completed on a larger scale or yet to be undertaken. 'I have discussed the probable origin of domestic pigeons at some, yet quite insufficient, length...' (p. 88); 'If I had space I could quote numerous passages...' (p. 90); 'To treat this subject at all properly, a long catalogue of dry facts should be given; but these I shall reserve for my future work...' (p. 101) – such formulations periodically resurface to remind us of the acknowledged insufficiency of the argument as it stood.

This is not to underestimate the confidence with which the original text makes its claims. The fact that, for some time now, the first edition has been the only version in print, is seen as a testimony to its qualities of freshness and directness: for the Harvard editor, Ernst Mayr, it 'represents Darwin in his most revolutionary spirit', while for the Penguin editor John Burrow it is 'a more clear-cut and forceful' version of its five successors. Yet Gillian Beer introduced an intriguing modification to this view when she suggested, in 1983, that the 'expressive' qualities of the first edition are precisely the condition of a linguistic indeterminacy and thus potential multivalency which, in subsequent editions, it was Darwin's task to limit and control.²⁶

Beer's emphasis on the comparative openness of the first edition, combined with the process of modification subsequently undertaken, invites us to question the sufficiency of the received notion of the *Origin* of 1859 as a single act of momentous significance, and directs our attention instead towards the text as a process. The *Origin* might thus be viewed not just as a culmination but also as an intervention, both in

Darwin's own trajectory (Vorzimmer has called it a 'stop-gap') and in a set of firmly-established debates around development hypotheses and their broader implications.²⁷ What made the *Origin* particularly susceptible to absorption into an arena of questioning and debate, and thus to the need for periodical textual response on Darwin's part, was its peculiar combination of scientific rigour and accessible structure and register, necessitating the urgent attention of the scientific community while issuing, in its own form, a challenge to the sole authority of that community to pronounce on its validity; Gillian Beer has elsewhere noted Darwin's Wordsworthian project in the *Origin*, 'to resolve scientific and common discourse as thoroughly as possible'.²⁸

The process of revising the *Origin* fell into two clear stages. After its publication by John Murray and sell-out in late November 1859, work on a revised edition of the text was in hand almost immediately. While the second edition, which was on sale by the turn of the year, embodied mostly minor changes, Darwin did take the opportunity to make certain more significant revisions in response to a critical furore which was already mounting: he chose, for example, to delete a key sentence in his speculations concerning a race of bears growing more aquatic till a creature might be produced 'as monstrous as a whale', though not, as Ellegård has pointed out, before critical damage had been done;²⁹ and he also deleted the comparison of the 'face of Nature' with a 'yielding surface' of 'ten thousand sharp wedges', which was to prove prominent and ambiguously suggestive for subsequent commentators. When, almost a year later and with about 3,800 copies sold, Murray indicated the need for a third edition, Darwin promised many 'corrections, or additions, ... in hopes of making my many rather stupid reviewers at least understand what is meant'.³⁰ Published in April 1861, this edition contained one important structural innovation, the 'Historical Sketch of the Progress of Opinion on the Origin of Species', and saw Darwin beginning to revise his position on – and thus, his formulation of – certain key issues such as the nature of evolutionary change through saltation. Extended reflections on the terms 'natural selection', with particular regard to the attributions of conscious volition to

which they had given rise, were directed towards those reviewers whose 'stupidity' can perhaps be deduced from the role of the exclamation mark here: 'Others have objected that the term selection implies conscious choice in the animals which become modified; and it has even been urged that as plants have no volition, natural selection is not applicable to them!'.³¹ Yet the third edition contained only 14 per cent of the total amount of variation to which the text was to be subjected.

It was thus in the second phase of revision, from 1866 to 1872, that the *Origin* underwent its most extensive transmutations, leading in Vorzimmer's words to a product 'no longer consistent with the original' or, more pointedly, to a 'mass of contradictions and incongruities' amounting to considerable 'structural weakness'. There is some critical consensus on this view: for James Moore, Darwin's theory still stood in the sixth edition, though 'neither so elegantly nor impressively as before', while for Robert Young it is a 'useful exaggeration' to say that the book should by then have been re-titled '*On the Origin of Species by Means of Natural Selection and All Sorts of Other Things*'.³² In the intervening period, Darwin had of course had time to reflect upon the accumulation of responses to the text while continuing the work on the laws of variation which was to lead to the publication of his *Variation of Animals and Plants under Domestication* (1868); and the fourth edition, published in December 1866, was the most thoroughly revised yet. But it was in the last two editions that Darwin was obliged to respond most fully to criticism in a way which led to the expansion and, as critics imply, the mis-shaping of the text.

Two particular critiques are of note here: the Scottish engineer Fleeming Jenkin's extensive review in the *North British Review* of June 1867, and the Catholic biologist St George Mivart's book *On the Genesis of Species* (1871). Arguing from what he modestly decried as 'mere mathematics' – notoriously, one of Darwin's theoretical weak spots – Jenkin constructed a powerful case against the efficiency of natural selection to perpetuate slight favourable differences. The careful statistical reasoning behind his insistence on the 'swamping' effect in nature exposed the weakness of Darwin's adherence to 'blending inheritance' as the mechanism of genetic variation. Just before

completing work on the fifth edition of the *Origin* in February 1869, Darwin was expressing his debts to Jenkin – 'has given me much trouble, but has been of more real use to me than any other essay or review'³³ – and acknowledged the debt explicitly in the edition (August 1869) which, as Vorzimmer has noted, revealed the 'full extent' to which the theory of natural selection had changed since the first edition.

The major structural changes to the sixth and final edition of the text were largely the result of Darwin's response to Mivart, against whose distortions and misrepresentations he felt lasting bitterness. Mivart had attempted to reconcile evolutionary theory with Catholic theology by insisting that the theory applied to the material world only; yet this did not prevent him at the same time from challenging Darwin's evolutionary mechanisms, reinstating saltation as a metaphysically-charged principle of transmutation and undermining Darwin's position on the retention of useless organs. In a new chapter VII, 'Miscellaneous Objections to the Theory of Natural Selection', Darwin incorporated his critique of Mivart alongside responses garnered from earlier sections of the text; this final edition was some 20 per cent larger than the first. But the inclusion of a Glossary of necessary scientific terms points towards what was, for the cultural status and reception of the *Origin*, perhaps the most significant aspect of change: this was the first edition of the text to be aimed at a popular market, completely re-set in a much smaller typeface and, at 7s6d, selling at half the previous price. Ellegård's study of the reception of the *Origin* has clearly established that the momentous public debate occasioned by the text throughout the 1860s could in no sense be described as a 'popular' debate; yet the first run of 3,000 copies of the sixth edition had sold out within a year, sales rising from 60 copies a month to 250.³⁴ It is thus worth emphasising this important disjunction: while in 1872 Darwin, in a condition of nervous stress, felt that he had at last exhausted his role in that cultural process which was the revision of and debate surrounding the *Origin*, the process was barely beginning for a wider audience set to benefit from the 1870 Education Act. The text which reached this audience, the sixth edition, was a rather different animal from the first edition which we

are obliged to read today; yet it was arguably this sixth edition which achieved the great popular impact now associated with the *Origin*.

To this sense of the text itself as a process, several contributors in this volume add a sense of the continuity of the *Origin* with its historical and discursive contexts. Harriet Ritvo maintains that the revolutionary 'discontinuity' of the *Origin* is a direct result of 'the inevitable selectivity of the historical gaze'; in contrast to the 'constructed isolation' framed by a retrospect which perhaps combines Kuhnian theory with heroic Darwinian narratives, she argues with a subtle irony that the text 'would have seemed to emerge *naturally* from contemporary scientific debates and preoccupations' (italics mine). Wilberforce's outrage at the suggestion of anthropoid connections pales in the popular cultural context of Victorian monkey shows, where such connections were taken for granted. David Amigoni notes the extent to which the *Origin* is 'never quite the intellectual dynamite that speculations about the "Darwinian revolution" have led us to expect', while Ted Benton's emphasis on the specificity of Darwin's explanatory purposes requires us to situate his thought in the context of a 'distinctive discourse of natural history'. Even on the question of that deafening silence in the *Origin*, the position of humankind in the evolutionary order, Peter Bowler has elsewhere noted the effect of Chambers's *Vestiges of the Natural History of Creation* (1844) in preparing the ground of debate, so that 'by the time Darwin published the *Origin of Species* in 1859, no one could be in any doubt as to the implications of applying the theory of evolution to mankind'.³⁵ If therefore the *Origin* can be defined as an ongoing process in Darwin's own work, these accounts equally place it within rather than outside a whole cultural and intellectual process: there is indeed a sense in which 'the world' was ready for the text.³⁶

In identifying the denial of teleology as the true element of radical discontinuity in the *Origin*, Thomas Kuhn also highlights something of the contradictory nature of this discontinuity. 'Evolution' was well established as a development hypothesis when Darwin wrote, articulated in the work of Lamarck, Chambers, Spencer and the German *Naturphilosophen*, but it was

clearly seen as a 'goal-directed process', with each new evolutionary development a step on the road towards 'the "idea" of man'. Natural selection was thus at its own historical juncture an *anti-evolutionary* theory, making terms such as 'evolution', 'development' and 'progress' 'suddenly seem[ed] self-contradictory'.³⁷ The dialectic between continuity and discontinuity in the *Origin* is a complex one; but to appreciate the extent to which defamiliarisation, in the form of a certain self-contradictoriness, was integral to Darwin's project in the text, we need to look more closely at some specific aspects of its rhetoric and reception.

Difficulty and ingenuity: language and science

It is known that for a long time Darwin was worried by the difficulty which he saw in the absence of a long chain of intermediate forms between closely-allied species, and that he found the solution of this difficulty in the supposed extermination of intermediate forms. However, an attentive reading of the different chapters in which Darwin and Wallace speak of this subject soon brings one to the conclusion that the word 'extermination' does not mean real extermination; the same remark which Darwin made concerning his expression: 'struggle for existence', evidently applies to the word 'extermination' as well. It can by no means be understood in its direct sense, but must be taken 'in its metaphoric sense'.

Petr Kropotkin, 1902³⁸

Let us turn, then, to the other hypothesis, and see how it would solve the problem. Adaptation, it says, is not merely elimination of the unadapted; it is due to the positive influence of outer conditions that have molded the organism on their own form. This time, similarity of effects will be explained by similarity of cause. We shall remain, apparently, in pure mechanism. But if we look closely, we shall see that the explanation is merely verbal, that we are again the dupes of words, and that the trick of the solution consists in taking the term 'adaptation' in two entirely different senses at the same time.

Henri Bergson, 1911.³⁹

These extracts from early-twentieth-century critiques of Darwin, both taking the *Origin* as their point of engagement, seem to

offer a marked contrast in orientation. Kropotkin's influential work of anarchist theory, *Mutual Aid*, took Darwinian evolutionary theory to task for its overweening emphasis on competitive struggle in nature, positing instead, and with particular reference to human life, the principle of co-operation as the fundamentally social means by which both individuals and species strive to maintain their existence and development. Bergson's *Creative Evolution*, which for Greta Jones had a considerable effect on evolutionary debate in Britain after its translation in 1911, helping to 'sharpen all the issues which had accompanied the original publication of the *Origin*', undertook a criticism of the explanatory logic of natural selection in the name of a vitalistic force or 'elan vital' driving transmutation in constantly unpredictable and non-teleological ways. Both, then, are libertarian texts, yet attributable to different ends of a spectrum of interest – Kropotkin's a basis for socio-political action, Bergson's an intervention in the realm of abstract philosophy or, as his critics might have it, of metaphysics.

It is thus important to note the common ground of analysis in these instances: to observe how the reader is enjoined to 'look closely' at, to 'an attentive reading of', Darwin's text, as the necessary basis of scientific and philosophical critique. For Kropotkin, Darwin's use of the word 'extermination', like the deployment of 'struggle for existence', is potentially misleading because of its metaphoric function, while for Bergson it is the term 'adaptation' in Darwin's lexicon which poses the crucial problem of ambivalence. Such examples indicate the centrality of linguistic analysis to the debate surrounding the *Origin*. Ted Benton's chapter in this volume makes a compelling case for the retention of a distinction between 'two interconnected but still analytically distinguishable struggles' in Darwin's work: 'to analyse Darwin's language', he notes, 'is not the same thing as to analyse his theory'. Nevertheless, Kropotkin and Bergson demonstrate the sense in which words inevitably constitute the ground upon which the scientific and philosophical veracity of Darwin's theory of natural selection is fought over; linguistic analysis appears inseparable from questions of scientific epistemology and procedure once we restore a text like the *Origin* to its earlier contexts of reception and debate. Thus,

David Amigoni finds Max Müller and Leslie Stephen simultaneously responding to the *Origin* as 'a form of dense, linguistic representation'. We glimpse here Moore's 'common context of language and assumptions', a relatively undifferentiated 'commons' which is subsequently enclosed by the same disciplinary formations that helped create the concept of Social Darwinism.

More surprising, perhaps, in the responses of Kropotkin and Bergson, is the sharing of a quite precise theoretical position on language itself. Kropotkin assumes a 'real' or 'direct' sense of 'extermination' which must be clearly distinguished from Darwin's 'metaphoric' use of the word. For Bergson, there is a realm of the 'merely verbal' from which Darwin's 'trick' of an ambivalent 'adaptation' must be rescued. Language in each case is an untrustworthy device, capable of achieving a pure referential fit with the world but equally capable of magical deception: we must guard against being 'the dupes of words'. Such attitudes to the waywardness of language, particularly in the form of metaphorical expression, are deeply inscribed in late-nineteenth- and early twentieth-century culture. The surprise lies only in the fact that inquisitive philosophical minds such as Kropotkin and Bergson, engaged in radical critiques of scientific orthodoxy, should reproduce a position on language which achieved its clearest theoretical expression in nineteenth-century positivist science. Herbert Spencer maintained an absolute distinction between 'real' and 'symbolic' conceptions, pointing out the 'perpetual danger' and 'error' of mistaking the latter for the former and grounding his positivist faith in the language of a civilisation evolving inexorably towards greater precision and definiteness.⁴⁰ T.H. Huxley, defending scientific knowledge against those 'extremely worthy, well-meaning persons' who might raise theological doubts, invoked the myth of Diogenes, who refuted the sophist's claim that all motion was an impossibility by 'simply getting up and walking round his tub'; the refusal of dialogue – 'the man of science says nothing to objections of this sort' – establishes a disdain of the verbal in the name of a mode of knowledge more practical and immanent.⁴¹ And again, David Amigoni characterises metaphor for Max Müller as 'a principle of degeneracy inherent in the evolution of language'.

No less than his more voluble compatriots in scientific popularisation, Darwin can frequently seem to adhere to the existence of a fundamental divide between a language enclosed in its own world of narcissistic trickery and a language which realised truth. In a letter to Lyell in 1861, he arrives at a characteristic position:

If you say that God ordained that at some time and place a dozen slight variations should arise, and that one of them alone should be preserved in the struggle for life and the other eleven should perish in the first or few generations, then the saying seems to me mere verbiage. It comes to merely saying that everything that is, is ordained.⁴²

'Verbiage' and 'mere verbiage' reappear periodically as terms of denunciation in Darwin's private dialogues and responses to criticism. In the *Origin*, this emphasis emerges, with a scare-quoting to embody a specifically linguistic alertness, in the conviction that 'It is so easy to hide our ignorance under such expressions as "the plan of creation," "unity of design," &c., and to think that we give an explanation when we only restate a fact' (p. 453). However, the grounds upon which Darwin can deny heuristic value to such formulations and claim it for the language of science, by which he can distinguish between a language which signifies only itself and one which signifies some reality outside of itself, may, as Edward Manier's excellent study indicates, be more complex than we might expect.⁴³ Manier indicates how the Scottish enlightenment philosopher Dugald Stewart almost certainly provided Darwin with a 'realist theory of metaphor', through which human language could be seen as grounded in a lexicon of 'natural signs' out of which the use of a more sophisticated 'artificial' language develops. This natural/artificial polarity, together with the suggestion of an organic process of growth which binds them together, could create an alertness for points at which the 'artificial' use of language departed from its natural base; yet it equally facilitates a historicist view of language which undermines any simple idealist sense of linguistic essentialism.

Accordingly, the *Origin* reveals tensions in its assumed relationship between language and scientific knowledge which often hinge on the role of metaphor. In the concluding chap-

ter, and looking ahead confidently to the 'considerable revolution in natural history' he expects to follow, Darwin seems unequivocally Spencerian: 'The terms used by naturalists of affinity, relationship, community of type, paternity, morphology, adaptive characters, rudimentary and aborted organs, &c., will cease to be metaphorical, and will have a plain signification' (p. 456). Even in the first edition, he is frequently careful to apologise for his 'convenient' uses of metaphor, for example in the 'large and metaphorical' sense in which 'struggle for existence' also carries a sense of 'dependence', and to alert us to the perhaps misleadingly anthropomorphic tendencies of his own terms – 'But to use such an expression as trying to make a fantail is, I have no doubt, in most cases, utterly incorrect' (p. 96). Yet a key passage in his thirteenth chapter, on Classification, indicates a more complex role for metaphor:

Naturalists frequently speak of the skull as formed of metamorphosed vertebrae: the jaws of crabs as metamorphosed legs; the stamens and pistils of flowers as metamorphosed leaves; but it would in these cases probably be more correct, as Professor Huxley has remarked, to speak of both skull and vertebrae, both jaws and legs, &c., – as having been metamorphosed, not one from the other, but from some common element. Naturalists, however, use such language only in a metaphorical sense: they are far from meaning that during a long course of descent, primordial organs of any kind – vertebrae in one case and legs in the other – have actually been modified into skulls or jaws. Yet so strong is the appearance of a modification of this nature having occurred, that naturalists can hardly avoid employing language having this plain signification. On my view these terms may be used literally; and the wonderful fact of the jaws, for instance, of a crab retaining numerous characters, which they would probably have retained through inheritance, if they had really been metamorphosed during a long course of descent from true legs, or from some simple appendage, is explained. (pp. 418–19)

This is not one of the *Origin's* most elegant passages, perhaps because of the contradictions it is required to negotiate. First, the language of metamorphosis is characterised as metaphorical or, more to the point, 'only' metaphorical, in the tradition of natural history. Yet we must note that metaphor in this context is not opposed to 'plain signification'; on the contrary, the

metaphor of metamorphosed parts impresses itself upon the naturalist precisely because it is a 'language' carrying 'plain signification'. Darwin can thus see no inconsistency in re-defining or 'using' the metaphor in a 'literal' sense – neither does he appear to see the extent to which his account has already problematised the divide between the literal and the metaphorical. Here it is worth reflecting back on the irony of the common root of 'metaphor' and 'metamorphosis': if Darwin affirms perpetual change or transformation as a law of the natural world, then he must equally divest metaphor of its inferior connotations of artifice and affirm it as a 'natural' law of language.

When, therefore, Darwin observes elsewhere that 'it is scarcely possible to avoid comparing the eye to a telescope' – that we 'naturally infer' that the eye has been formed by a process analagous to the operation of the highest human intellects – he crystallises some characteristic tensions produced by a growing awareness of the role of language in nineteenth-century scientific epistemology. In its context, the 'Difficulties on Theory' chapter of the *Origin*, the observation prefigures an extended reflection on the inadequacy of such anthropomorphic figurations to the complex material reality and development of the eye. Yet it also embodies an acknowledgement of the inevitably or 'naturally' metamorphic functioning of human knowledge, underpinned by a belief that this mode is not simply a symptom of a humanity's fallen condition but does have some necessary relationship to the order of nature. Darwin may have exhibited some of the necessary positivist machismo about the 'plain signification' of scientific language and its proud distance from 'mere verbiage', but the fractures and tensions we find in the *Origin* tell a different and more complex story.

When we turn to the immediate reception of the *Origin* from within the scientific community, certain recurrent patterns of response reinforce a sense of the singularity of the text as a linguistic artefact. It seems clear that, in the words of the French scientist Jules Pictet, Darwin was perceived to have represented his evidence 'in a novel form, and in a way freed from the ordinary routine'.⁴⁴ The text elicits frequent observations on its language and form, and central to such observations are the terms 'ingenious' and 'ingenuity': 'thus', Pictet notes of the

transition from Lamarckian to Darwinian evolution, 'in an ingenious manner, he brings in a new agent which he calls *natural selection*', ending his review with carefully-qualified praise for Darwin's 'beautiful book' and 'seducing argument'. In different hands the same terms could appear to be a far less equivocal indictment: Thomas Vernon Wollaston's damning yet patronising review culminates in the sarcastic imputations that the text was 'eloquently written' in a 'pleasant medium', finally quoting Darwin's concluding 'entangled bank' passage as 'certainly very beautiful, though we can scarcely believe that our author was in earnest when he wrote it'.⁴⁵ Earlier in the review, Wollaston slurs Darwin's observation on descent from one primordial form with 'This is plain language, at any rate!', then immediately characterises it as an 'ingenious fancy'. Sir William Armstrong, referring to the 'profound sensation' caused by the *Origin* in his opening address to the British Association for the Advancement of Science meeting at Newcastle in 1863, noted that 'The novelty of this ingenious theory, the eminence of its author, and his masterly treatment of the subject have perhaps combined to excite more enthusiasm in its favour than is consistent with that dispassionate spirit which it is so necessary to preserve in the pursuit of truth'.⁴⁶ Fleeming Jenkin, in his powerful but even-handed critique, could observe:

Some persons seem to have thought his theory dangerous to religion, morality, and what not. Others have tried to laugh it out of court. We can share neither the fears of the former nor the merriment of the latter; and, on the contrary, own to feeling the greatest admiration both for the ingenuity of the doctrine and for the temper in which it was broached, although, from a consideration of the following arguments, our opinion is adverse to its truth.⁴⁷

while in a similar spirit of hard-edged scepticism the American philosopher C. S. Peirce maintained, in 1893, the following:

What I mean is that his hypothesis, while without dispute one of the most ingenious and pretty ever devised, and while argued with a wealth of knowledge, a strength of logic, a charm of rhetoric, and above all with a certain magnetic genuineness that was almost irresistible, did not appear, at first, at all near to being proved; and to a sober mind its case looks less hopeful now than it did twenty years ago.⁴⁸

What did it mean to characterise the *Origin* as 'ingenious'? The term clearly embodies a varying faintness of praise, with the likes of Jenkin and Peirce at one end of the spectrum and Wollaston at the other. While Samuel Johnson's *Dictionary* of 1785 (sixth edition) gives 'witty, inventive; possessed of genius', with 'mental; intellectual' as secondary and anachronistic uses, it seems that in Darwin's context the term was mutating towards the present, somewhat diminished connotations of 'skilful contrivance'. Thus, in the context of scientific writing, it is not coincidental that Darwin's 'ingenuity' should lie in close association with his way with words in the production of an argument variously 'beautiful' and 'pretty', 'seductive' and 'charming'. This is clearly a skill – but what man of science would want it? The potentially wayward and magical qualities of language, and the manipulative skills of its practitioners in the realms of art and rhetoric, are a deeply feminised influence, embodying a mischievous intelligence which threatens to pull a man from the straight-and-narrow (to borrow Sedgwick's phrase) 'tram-road of all physical truth'.⁴⁹

In the comparative anatomist Richard Owen's critique of the *Origin* in the *Edinburgh Review* of April 1860, these kinds of connotation are woven into a more complex example of the extent to which cultural values might surround and inform scientific criticism. The review was, in effect, the moment at which an uneasy build-up of professional and personal antagonisms, characteristic of the politics of evolutionary science within which Darwin was obliged to operate, could surface and become public.⁵⁰ The full extent of what it meant to be an 'ingenious writer' is revealed in Owen's explicit application of the terms to Robert Chambers, the anonymous author of the *Vestiges of the Natural History of Creation*, so important in preparing the cultural landscape for the entry of the *Origin* yet so heavily criticised for its speculative character and cavalier approach to scientific proof. Darwin is nevertheless linked by association, being accused by Owen of ungratefully ignoring his debts to Chambers and of speculating in a similarly 'rash' and 'unlawful' fashion. The review begins, however, with a set of biographical observations on Darwin which set an interpretative framework for the critique that follows. Here, Owen

asserts, Darwin 'has long been favourably known, not merely to the Zoological but to the Literary World', thanks to the 'charming style' of his *Beagle* narrative. He then chooses to note that Darwin is of 'independent means', thus giving him 'full command of his time for the prosecution of original research': his 'tastes' have led him to Natural History and his 'favourite subject' has become the origin of species. In the *Origin* itself, 'the same pleasing style' which marked his earlier work and 'a certain artistic disposition' and structure of argument have led 'several, and perhaps the majority, of our younger naturalists' to be 'seduced into the acceptance' of the theory of transmutation by natural selection.

The explicit linking of a feminised linguistic ingenuity with the 'Literary World' – 'charming', 'pleasing', 'seductive' – is here supplemented by an unmistakable discourse on class. 'Taste', an aesthetic category deriving from that 'artistic disposition' and polite culture of the Literary World to which his independent means gave access, led Darwin to science rather than – we assume – hard work or professional commitment. Owen succeeds in establishing a distance between the 'scientific world' and Darwin which at the same time separates the manly 'labourer' or 'fellow-labourer' – terms used by Owen to denote the scientific community – from an effeminate culture of privilege. Beneath the tone of sometimes-strained politeness in Owen's review is a barely-disguised insinuation that Darwin is not a proper scientist – just as Jenkin was able to become gradually more satirical in his own review about the ability of 'believers' to 'invent' any necessary set of circumstances, such as an unlimited amount of geological time, in order to make a theory work.⁵¹ Such insinuations were a hazard always faced by Darwin because of his lack of formal education and training in science. Less obvious, but nevertheless manifest in them, was the suggestion that scientific integrity could be measured in inverse proportion to rhetorical skill and exertion.

There is, however, an irony in Darwin's association with the 'ingenious' which surfaces if we turn again to reflect upon the historical relationship of the adjective to 'ingenuity', whose primary definition in Johnson's *Dictionary* of 1785 affiliates it rather with 'ingenuous' – that is, to 'openness, fairness, candour,

freedom from dissimulation'. Only secondarily, 'from ingenious', do we have 'wit, invention, genius, subtlety, acuteness' – meanings which, according to the 1983 *Chambers*, are derived from 'ingenious' 'by confusion'. It thus appears that 'ingenuity', in undergoing gradual change in use, has acted as a hinge between virtually contradictory meanings: openness and freedom from dissimulation in its actual source, 'ingenuous', a subtle and inventive wit or 'skilful contrivance' (1983 *Chambers* again) in its trajectory of change towards 'ingenious'.

We can only speculate on the degree of intermixture inscribed in the deployment of these terms by Darwin's critics from the 1860s onwards. What is arresting is the extent to which the ambivalence of 'ingenuity' is appropriate to a central ambivalence in representations of Darwin's scientific method. Against the view of ingenuity we have been pursuing, perpetuated though turned to positive effect in James Moore's estimation of Darwin as 'the outstanding conjuror of all time', we can set the claim that Darwin possessed 'an instinct for truth-telling which had hardly ever been surpassed' and strove 'to perfect himself as a fact-and-dust man'; against Gillian Beer's uncovering of Darwin's deep youthful pleasure in 'the power of lying, of invention, of telling and not-telling' – 'I recollect when I was at Mr. Case's inventing a whole fabric to show how fond I was of speaking the *truth!*' – we can set Emma Darwin's belief that 'he is the most open, transparent man I ever saw, and every word expresses his real thoughts'.⁵²

The substantial and growing body of work on Darwin's language and rhetorical strategies might be prefaced by Edward Manier's observation that 'the *representation* of his theory is the key to its scientific and its cultural interpretation'.⁵³ In the remainder of this section of the chapter I want to offer a reading of the structure and some of the rhetorical features of the *Origin*, exploring in particular some characteristics of the linguistic ingenuity which has both troubled and impressed Darwin's critics. My aim will be to move towards a precise delineation of the kind of ambivalence identified, for example by C. S. Peirce as 'a certain magnetic genuineness that was almost irresistible', or more recently by David Hull as the desire on Darwin's part to 'tell' in the *Origin* 'a totally consistent natu-

ralistic story or none at all'.⁵⁴

The telling of this story, or alternatively the unravelling of its 'one long argument', spanned fourteen chapters in the original edition. The misgivings of Vorzimmer and others concerning the mis-shapen growth of the final sixth edition may in part be due to an overestimation of the perfected 'organic' form of the first: the *Origin* is neither a realist novel nor a romantic poem, though it does have affinities with each, and a fascinating organisational logic. Chapter I, 'Variation under Domestication', is an exercise in safety and tact: Darwin's appeal to what breeders and gardeners have long known is an appeal to practical, observed and common knowledge as the basis of the theory of natural selection, which terms are tentatively introduced towards the end of the chapter and only after the previous tentative introduction of the alternative 'Unconscious Selection'. 'Theoretical writers' are stigmatised, in the manner of Huxley's Sophists, as the only ones to have doubted the strong principle of inheritance; yet, Darwin's deference to the breeders is not total: his recollection of being 'laughed to scorn' by a celebrated raiser of Hereford cattle over the suggestion that his stock might have descended from long-horns is the pretext for a warning to naturalists not to adopt the same kind of narrowmindedness – breeders in general 'well know that each race varies slightly, for they win their prizes by selecting such slight differences, yet they ignore all general arguments, and refuse to sum up in their minds slight differences accumulated during many successive generations' (pp. 88–9). This is a brief glimpse, allowed to us in this otherwise cautious opening chapter, of the supreme confidence Darwin can show in his theory.

Chapter II, 'Variation under Nature', completes the famous analogy between natural selection and the practices of breeding and cultivation, whether conscious or unconscious, which constitutes the opening gambit of the *Origin*. Yet this short chapter does not press home the analogy with rhetorical force: the subject of variation in nature is instead approached as demonstrating the difficulty of distinguishing in any absolute sense between species and varieties. Some statistical analysis is used to demonstrate that 'species are only strongly marked and permanent varieties', prefiguring the necessary prominence of

this mode of analysis in the following chapter. It is in the next two chapters, however, that the *Origin* reaches its dramatic and argumentative core; here the twin arms of his theory, struggle for existence and natural selection, are articulated together. Chapter III marks a profound shift in tone and address appropriate to the active and emotive concept of Malthusian 'struggle' with which it is concerned. By contrast with the opening pair, this is a piece of romantic writing, with an expressive register (the early references to 'beautiful co-adaptations' such as the woodpecker and the mistletoe mark a break from the preceding text and set the tone for what follows), a more personal note of address ('Nothing is easier than to admit in words the truth of the universal struggle for life, or more difficult – at least I have found it so – than constantly to bear this conclusion in mind' – pp. 115–16), and a gradually mounting tone of Wordsworthian awe at the incessant process of struggle and its often incredible corollaries. The chapter is, for example, animated and given a cumulative rhythm by the increasing use of exclamation in its later stages; like Wordsworth, Darwin uses the exclamation mark to lift the denotation of a natural process or phenomenon into a sense of wonder: 'Hence it is quite credible that the presence of a feline animal in large numbers in a district might determine, through the intervention first of mice and then of bees, the frequency of certain flowers in that district!' (p. 125). While partly a response to the colourful implications of 'struggle', such animation is also borne out of the realisation that some mental energy and projection is required on the part of his reader to envisage some of the practical effects of the abstract process of species 'striving to increase at a geometrical ratio'; the final paragraph thus appropriately begins with the recommendation that it is good 'to try *in our imagination* to give any form some advantage over another' (p. 129 – my italics).

If chapter III is dominated by the exclamatory mode, Chapter IV, the key articulation of 'Natural Selection', is both more interrogative and more strongly assertive of the legitimacy of its own arguments. Rhetorical questions figure prominently, in combination with a didactic insistence: 'Let it be borne in mind...', 'let it be remembered...', 'let us now take...' This

mode, reinforced by the well-known branching diagram or 'great Tree of Life' simile (see Ritvo, p. 56–7), gives momentum to an argument growing in authority; Darwin has his own theory in the dock, but the apparent rigour of his cross-examination allows moments of almost unequivocal confidence: 'and as modern geology has almost banished such views as the excavation of a great valley by a single diluvial wave, so will natural selection, if it be a true principle, banish the belief of the continued creation of new organic beings, or of any great and sudden modification in their structure' (p. 142).

These first four chapters, establishing the basic proposals of the *Origin*, constitute the opening phase. From this point onwards, in both structural and linguistic terms, 'difficulty' becomes the dominant principle in Darwin's negotiation of the relationship in the text between self-criticism and assertion. Significantly, a chapter is immediately devoted to the 'Laws of Variation', before the sixth chapter 'Difficulties on Theory', reflecting the profound awareness on Darwin's part of the lack of a coherent genetic theory upon which to predicate the mechanism of natural selection. 'Difficulties on Theory' then initiates that process of extensive questioning which has led Fleming to speak of Darwin's unsurpassed 'instinct for truth-telling': 'has there ever been another scientist who included in his great book all the arguments against it that he could ever think of?'³⁵ Chapter VI outlines these main 'difficulties' and then proceeds to confront two of them, the absence of visible transitional forms in nature and the origin and development of common organs in creatures of widely different habit, reserving the following two chapters for a separate discussion of further major difficulties, the problem of the evolution of complex instincts through natural selection, and the questions of sterility, hybridism and the possibility of fluid transmutation through intercrossing in nature. While the latter chapter constitutes a return to the deconstruction of the species–variety distinction initially undertaken in chapter II, it also marks the end of the discussion of what might be called the internal or organic difficulties confronting natural selection theory. In the four chapters which follow, Darwin turns his attention to problems inherent in the external dimensions of the theory: in the

adequacy or otherwise of geological evidence to account for the gradual succession of organic beings, including the vexed issue of extinction; and in the possibility of harmonising the actual geographical distribution of the world's inhabitants with transmutation through natural selection. A thirteenth and penultimate chapter thus stands somewhat on its own, though its focus on taxonomy via the 'Mutual Affinities of Organic Beings' serves as an important reminder that the whole structure of the *Origin* might be viewed as a debate around human systems of classification as much as an attempt to give unmediated access to the true principles of development in organic life.

'Difficulty' is, however, an ambivalent, and possibly therefore an ingenious, weapon in the rhetorical strategies of the *Origin*. At times, the reader could be mistaken for thinking that the function of the text is to convince her of the extent of our ignorance on all of the issues that bear significantly on an understanding of evolution: reiterations of the parlous state of this knowledge are frequent, 'nor', Darwin maintains, 'do we know how ignorant we are' (p. 440). Yet such admissions of difficulty become, paradoxically, the precise condition of the text's truth-claims. Darwin's rhetorical skill is to impress upon his reader the extreme intricacy, precariousness and lack of substance of his theory, yet simultaneously to give a sense that the same reader already has, in their own observation of nature, a fundamental insight into the basis of the theory: we know hardly anything about this, and yet we know a lot, partly because of our own common sense, and partly because knowing the true and vast extent of our ignorance clarifies and enhances the basis of real knowledge we do possess.

There are a number of ways in which the *Origin* achieves this effect. First, there is a recurrent tendency to counterbalance expressions of extreme difficulty with a coolly-rational negation of them:

Long before having arrived at this part of my work, a crowd of difficulties will have occurred to the reader. Some of them are so grave that to this day I can never reflect on them without being staggered; but, to the best of my judgement, the greater number are only apparent, and those that are real are not, I think, fatal to my theory. (p. 205.

The reader could be forgiven for admiring here the speed with which Darwin is able to recover from being 'staggered' by the gravity of his problems, courtesy of the deft use of the semicolon and what follows it. Similarly, approaching the conclusion of chapter IX, on the imperfection of the geological record, Darwin declares the 'several difficulties here discussed' to be 'all undoubtedly of the gravest manner', to which the adherence of 'all the most eminent palaeontologists' to the theory of immutability of species seems eloquent testimony; yet this does not discourage him from invoking Lyell's doubts, and his metaphor of the geological record as 'a history of the world imperfectly kept, and written in a changing dialect', in order to arrive at a final striking sentence: 'On this view, the difficulties above discussed are greatly diminished, or even disappear' (pp. 315–16). Thus, radical scepticism and radical optimism co-exist *within* the concept of difficulty; by placing his theory on a knife-edge, Darwin is able to impress the reader both with his brutal honesty and with the resistance of his theory to a Popperian falsifiability: 'If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find no such case' (p. 219).

In a perhaps more ingenious sense, therefore, such as we find in the example of the electric organs of fishes – 'impossible to conceive by what steps these wondrous organs have been produced' – impossibility in the present is the very ground of possible proof in the future: if we cannot say definitively how these organs have originated, we cannot *not* say that a transitional development may have occurred:

[A]s Owen and others have remarked, their intimate structure closely resembles that of common muscle; and as it has lately been shown that Rays have an organ closely analogous to the electric apparatus, and yet do not, as Matteuchi asserts, discharge any electricity, we must own that we are far too ignorant to argue that no transition of any kind is possible. (p. 222)

This instance points to the prominence of two further strategies. First, 'difficulty' in the *Origin* operates in two distinct

temporal senses: while it is often 'grave' and apparently almost insuperable in the present, it is to be confidently eradicated in the future. We should not therefore be misled by its frequent recurrence in the text, because that recurrence is often in the form of variants on the formula, 'I can see no difficulty', 'I can see no great difficulty', 'I can see no very great difficulty', 'I cannot see that it would be an insuperable difficulty'. The formula is not selective, for it is used in negotiating the most unlikely hypotheses and examples of transmutation, such as the aquatic bear and the evolution of the eye. Second, Darwin is adept and consistent in his deployment of the multiple negative form:

[Y]et in the case of any organ, if we know of a long series of gradations in complexity, each good for its possessor, then, under changing conditions of life, there is no logical impossibility in the acquirement of any conceivable degree of perfection through natural selection. In the cases in which we know of no intermediate or transitional states, we should be very cautious in concluding that none could have existed, for the homologies of many organs and their intermediate states show that wonderful metamorphoses in function are at least possible ... We are far too ignorant, in almost every case, to be enabled to assert that any part or organ is so unimportant for the welfare of a species, that modifications in its structure could not have been slowly accumulated by means of natural selection. (pp. 231-2)

Here too, it is difficult to avoid linking the indirectness and evasiveness associated with this linguistic form to a subtle ingenuity in Darwin's procedure: what does the *Origin* have to hide? The answer proposed for example by Desmond and Moore, and confirming what is explicit in the notebooks from 1837 onwards, would seem to be, a great deal: Darwin had long been preoccupied by the potentially incendiary materialism of his theory, and the long years of reluctance and failure to publish had produced a nervously-fraught, wary and defensive consciousness. Studies of Darwin's reading and intellectual influences have also suggested a depth and sophistication to modify the image of the 'anaesthetic' scientific man.⁵⁶ The 'ingenious' Darwin has thus re-emerged in recent Darwin criticism as an important alternative to Darwin's own self-fashioned image as

a simple, honest but inarticulate toiler at the scientific chalk-face. Charles Kay Smith has proposed that Darwin cultivated 'rhetorical ambiguities' in order to avoid critical controversy, while Gillian Beer's seminal work has consistently stressed that the multivalent 'quagmire' of the metaphoric was necessary for the articulation of his theory: 'He needs its tendency to suggest more than you meant to say, to make the latent actual, to waken sleeping dogs, and equally its powers of persuasion through lassitude, through our inattention'.⁵⁷

It is true that a certain guile becomes manifest at times: accounting for the absence of frogs, toads and newts on the 'peculiarly well-fitted' oceanic islands in the Pacific with the explanation that they could not be transported across the seawater which kills them, Darwin cannot resist a final gibe: 'But why, on the theory of creation, they should not have been created there, it would be very difficult to explain' (p. 382). Yet this is an instance of the broader and paradoxical fact that as the *Origin* moves through its substantial investigation of 'difficulties', so it becomes stronger and more self-assured in its argument: scepticism and confidence nourish each other. The vision of the 'revolution in natural history', the opening of 'a grand and almost untrodden field of enquiry' anticipated in the glowing utopian prose of the final 'Recapitulation and Conclusion' chapter are difficult to recognise as parts of the same work as the cautious opening 'Variation under Domestication'.

The 'ingenious' Darwin, subtly aware of the linguistic balancing acts necessary for the representation of a highly speculative theory in the terms of empirical method and observation, is an important aid to our understanding of the particular form of the *Origin*. Yet the image is inadequate if it leads to a wrenching of form from theory – that is, if it creates a sense of dichotomy between clever rhetorical contrivance and the scientific, epistemological and philosophical orientations of the work. This dichotomy, initially constructed by contemporary reviewers of the *Origin* who were often also professional opponents of Darwin, can be read as an attempt to discredit and defuse what was radically new not simply in the language of the text but in its wide-ranging and subversive cultural implications. If, on the contrary, 'difficulty' performs such a prominent role in the

shaping of the text, this may be because it is a central constitutive aspect of Darwin's innovatory and challenging vision. In concluding this chapter, I want to suggest that 'difficulty' in the *Origin* is an inherent factor in the text's relation to the linked concepts of relativity and modernity, and that Darwin's relationship to Romantic discourse and representation is a necessary starting-point for such a reading.

In his 1981 essay 'Darwin and Landscape', James Paradis presents a Darwin who anticipates and prepares the ground for the development of Cubist art. In the *Origin*, Paradis asserts, Darwin had arrived at a way of seeing nature, of organising the visual field, in terms of a 'repetitiousness of form, geometrics of organisation', which represented a radical break from the Romantic tradition: 'beyond the impression of the moment, which is likely to fill one with a feeling of the beauty, the spontaneity and harmony of life in the natural landscape, there is an unsuspected geometry of great preciseness and definition'. Through this radical defamiliarisation, nature is re-thought – or re-visualised – as a spatial economy of incredible density, a 'perpetual disequilibrium' of contending forces; and, for Paradis, 'it would take art fully half a century to follow him into the labyrinth of lines and patterns he had discovered in the familiar landscape'.⁵⁸

Romanticism had, however, exerted a powerful influence on Darwin's earlier vision, exemplified for Paradis by the *Beagle* narrative and its 'celebration' of 'transcendent moments of timelessness in the wilderness', and it clearly survives in, for example, the 'Struggle for Existence' chapter of the *Origin* briefly considered above. We would be quite wrong, as Paradis himself acknowledges, to see Romanticism totally displaced in the *Origin*; but we can say that the Romantic sense of the grandeur and sublimity of nature which pervades the text is shifted to a new object – no longer an inscrutable workmanship evident in things themselves and their harmoniousness with human subjectivity, but the unthinkably slow and complex processes of transformation in nature. Thus, in the revealing conclusion to the chapter on 'Instinct', Darwin could declare that while it might not be a 'logical deduction', it was far more satisfactory to his 'imagination' to see complex instincts as

'small consequences of one general law'; or in reflecting on the possible denudation of some 12,000 feet of rock in Merionethshire, he could exclaim: 'The consideration of these facts impresses my mind almost in the same manner as does the vain endeavour to grapple with the idea of eternity' (pp. 263 and 296).

Wordsworthian parallels are inevitably brought forth by an examination of the *Origin's* rhetoric. But Darwin's esteemed Wordsworth could also apostrophise Coleridge thus:

Thou, my Friend! art one
More deeply read in thy own thoughts; to thee
Science appears but what in truth she is,
Not as our glory and our absolute boast,
But as a succedaneum, and a prop
To our infirmity. No officious slave
Art thou of that false secondary power
By which we multiply distinctions, then
Deem that our puny boundaries are things
That we perceive, and not that we have made.
To thee, unblinded by these formal arts,
The unity of all hath been revealed.⁵⁹

It is worth reflecting upon the contradictory relationship between this passage and Darwin's science in the *Origin*, in order to signal something of the complexity of Darwin's inheritance and appropriation of Romantic epistemology. A science which both multiplied and then reified its own distinctions is, of course, precisely what Darwin was conscious of in his deconstruction of the species–variety distinction – to him also, in this sense, 'the unity of all' had been revealed. Yet nature in the *Origin* is no less systematic, and therefore amenable to description and classification, for being unified; Darwin could accept Wordsworth's critique of the inherently anthropomorphic nature of all representation – indeed, it was a problem with which he continually wrestled, as the work of Robert M. Young and Gillian Beer has shown – while refusing the characterisation of representation as 'secondary'.⁶⁰ Rather, the 'officious slavery' against which the *Origin* was sent to do battle lay in the 'false distinctions' multiplied by Creationists or 'species-mongers' in the name of a specious 'unity of all' with which Wordsworth, in his critique of science, perhaps unconsciously colluded.

Two 'unities' therefore emerge: one guaranteed by an Absolute, spiritualised nature, the other guaranteed by the complex and specific interrelatedness of a physical system of disequilibrium in nature. As Paradis notes, the *Origin* of 1859 showed how Darwin had arrived at a new, naturalistic and physical understanding of the landscapes he had first seen and interpreted on the *Beagle* voyage, eclipsing spiritual law by acknowledging the 'conditions of existence' rather than the end of existence as the highest law of development. But 'naturalistic' must here be grasped in its full, paradoxical sense: a theoretical understanding of the physical or ecological interrelatedness of things brings with it a realisation of the impossibility of any stable, absolute knowledge of that condition.

Thus, half a century before an illustrious successor whose new physics became synonymous with the moment of cultural modernism, Darwin produced in the *Origin* a general theory of relativity. 'By the experiment itself', he notes in his discussion of experimentation in domestic breeding, 'the conditions of life are changed' (p. 77) – a recognition of the relativity of knowledge to the observation process which constituted his basic understanding of the relation between theory and practice: 'without the making of theories I am convinced there would be no observation...'; 'How odd it is that anyone should not see that all observation must be for or against some view if it is to be of any service!'⁶¹ If, however, results are relative to the frameworks in which they are interpreted, theoretical frameworks must also be relative to results: 'systematists', he reminds us, 'are far from pleased at finding variability in important characters, and ... there are not many men who will laboriously examine internal and important organs, and compare them in many specimens of the same species'; the result of such empirical rigour is that 'parts which must be called important, whether viewed under a physiological or a classificatory point of view, sometimes vary in the individuals of the same species' (p. 102). What constitutes 'importance' or 'fitness' is entirely relative even to individuals, almost always possessing a 'plasticity' of organisation, within a species – a key statement of the anti-essentialism which has been seen as the *Origin's* fundamental challenge to Western metaphysics. When applied to the

human and moral sphere, fascinating tensions result: underlining the conviction that savages must practise unconscious if not conscious selection processes in the breeding of their animals, the word 'even' in the following sentence condenses a perhaps unseen moral ambiguity: 'We see the value set on animals even by the barbarians of Tierra del Fuego, by their killing and devouring their old women, in times of dearth, as of less value than their dogs' (p. 94). The challenge, which the work of James Rachels has recently explored, of Darwin's moral individualism to the traditional morality by which humans and non-humans occupied separate moral categories, could clearly produce ambivalent results: a principled opposition to the practice of vivisection on the one hand, while on the other, as Ellegård observed of the 'relativistic view of human morality' implicit in Darwinian theory,

There was no reason to expect the systems of values, whether ethical or aesthetical, which were actually to be found in human societies, to have any sort of universal and absolute validity. They had been developed in response to the particular conditions under which the different communities had found themselves. Communities adopting a moral code which made them prosperous and strong would tend to proliferate. To the extent that they succeeded in inculcating their beneficial code in their descendants, or in others who came under their influence, such a moral system would tend to gain ground. But the fact that a certain moral code had established itself did not prove that it was a perfect one, even for the society which had developed it.⁶²

Finally, as Stanley Hyman has suggested, even death can be seen as an implicitly relative term in the *Origin*: 'death is not inherent in the properties of the protoplasm (the simplest organisms do not die), but is a trait evolved by natural selection, permitting a speedier improvement of the higher organisms, and thus an advantage for competition and a good for life'.⁶³

Given this pervasive relativism, it is entirely appropriate that Darwin should have chosen for the *Origin* a mode of systematic uncertainty, inconsistency and contradiction. An irresistible and magnetic 'genuineness' is of course integral to this mode: the fact that Darwin can sustain the illusion of naturalism, guaranteed by a narrative voice of complete integrity,

in the face of so much difficulty, and of such a radical assault on the common sense of the implied reader, is precisely the condition of his story's contradictoriness. In a recent essay, Phillip Barrish finds in the *Origin's* 'oxymoronic' laws of variation a 'family resemblance' with deconstructive, psychoanalytic and Marxist models of theory, in all of which we find the 'intellectual necessity of theorising the agency of anonymous effects'.⁶⁴ The invisible or inaccessible origins of material effects can be formulated in laws only retrospectively, 'once the "natural order" they contribute to is in place'; Darwin's characterisation of natural selection, like Foucault's problem of having to name Power, bespeaks that 'snare of language (of the arch-fallacies of reason petrified in language)' which for Nietzsche obliged the scientist to present all activity as 'conditioned by an agent – the "subject"': 'for all its detachment and freedom from emotion, our science is still the dupe of linguistic habits; it has never got rid of those changelings called "subjects"'.⁶⁵ Darwin may have been trapped in this snare, but his struggles in the *Origin* produced a dialectic – the refusal of law, yet the necessity to formulate law; the scientific verification of the absence of law – which identifies him precisely with the anxieties surrounding knowledge and expression so characteristic of the conditions of modernity. We might note that the origins of these conditions can be traced in the Romanticism which was such a formative influence on Darwin. While perhaps bearing himself the physical and psychological scars of an 'irritable reaching after fact and reason' for much of his mature life, Darwin's work is positively impelled by a 'negative capability' which produced, in the *Origin*, a critical and creative state of doubt and uncertainty.

Notes

- 1 Quoted in Howard E. Gruber and Paul H. Barrett, *Darwin on Man: A Psychological Study of Scientific Creativity, together with Darwin's Early and Unpublished Notebooks* (London: Wildwood House, 1974), p. 40; see chapter 2, 'The Threat of Persecution'.
- 2 Morse Peckham (ed.), *The Origin of Species by Charles Darwin: A Variorum Text* (Philadelphia: University of Pennsylvania Press, 1959), p. 337.
- 3 J. Morrell and A. Thackray, *Gentlemen of Science: The Early Years of the British Association for the Advancement of Science* (1981; Oxford: Oxford

- University Press, 1983).
- 4 T. H. Huxley, 'On the Educational Value of the Natural History Sciences' (1854), in Huxley, *Man's Place in Nature and Other Essays* (London: J. M. Dent, 1906), p. 268; Herbert Spencer, *First Principles* (1862; London: Watts & Co., 1937), p. 14.
 - 5 Charles Darwin, *On the Origin of Species by Means of Natural Selection*, edited by Ernst Mayr (Cambridge, MA: Harvard University Press, 1966), p. vii.
 - 6 Steve Jones, *London Review of Books*, 22 April 1993.
 - 7 Robert M. Young, 'Darwin's Metaphor: Does Nature Select?,' in *Darwin's Metaphor: Nature's Place in Victorian Culture* (Cambridge: Cambridge University Press, 1985), p. 113.
 - 8 Peckham, *Variorum*, p. 753.
 - 9 Thoms Vernon Wollaston, 'Review of the *Origin of Species*', from *Annals and Magazine of Natural History* (1860) 5: in David L. Hull, *Darwin and His Critics: The Reception of Darwin's Theory of Evolution by the Scientific Community* (Cambridge, MA: Harvard University Press, 1973), p. 139.
 - 10 Gruber and Barrett, *Darwin on Man*, p. 152.
 - 11 See Michael T. Ghiselin, *The Triumph of the Darwinian Method* (1969; Chicago and London: University of Chicago Press, 1984), pp. 89–102.
 - 12 Victor Shlovsky, 'Art as Technique', in K. M. Newton, ed., *Twentieth Century Literary Theory: A Reader* (Basingstoke: Macmillan, 1988), p. 24.
 - 13 For alternative observations on the title of the text, see Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (1983; London: Ark, 1985), pp. 64–65.
 - 14 Bert James Loewenberg, 'The Mosaic of Darwinian Thought', *Victorian Studies* III: 1 (1959), p. 13.
 - 15 See for example John Greene, 'Darwin as a Social Evolutionist', *Journal of the History of Biology* 10 (1977), pp. 1–27.
 - 16 Robert M. Young, 'Darwinism is Social', in David Kohn, ed., *The Darwinian Heritage* (Princeton: Princeton University Press, 1985), p. 633.
 - 17 James Moore, *The Post-Darwinian Controversies: A Study of the Protestant Struggle to Come to Terms with Darwin in Great Britain and America 1870–1900* (Cambridge: Cambridge University Press, 1979), p. 125. Moore's reflections are contained in the essay 'Socializing Darwinism: Historiography and the Fortunes of a Phrase', in *Science as Politics*, ed. Les Levidow (London: Free Association Books, 1986).
 - 18 Valentino Gerratana, 'Marx and Darwin', *New Left Review* 82 (1973), p. 79.
 - 19 Moore, *The Post-Darwinian Controversies*, p. 159; Gruber and Barrett, *Darwin on Man*, p. 69.
 - 20 James Moore, 'Darwin of Down: The Evolutionist as Squarson-Naturalist,' in *The Darwinian Heritage*, ed. David Kohn, p. 474.
 - 21 Adrian Desmond and James Moore, *Darwin* (London: Michael Joseph, 1991), p. 237; see especially chapter 16, 'Tearing Down the Barriers'.
 - 22 Raymond Williams, 'Social Darwinism', in *Problems in Materialism and Culture: Selected Essays* (London: Verso, 1980), p. 89.
 - 23 Moore, 'Socializing Darwinism', in *Science as Politics*, ed. Levidow, p. 62.
 - 24 *Ibid.*, p. 63.

- 25 Peter J. Vorzimmer, *Charles Darwin: The Years of Controversy: The Origin of Species and its Critics 1859–1882* (Philadelphia: Temple University Press, 1970), p. 270.
- 26 Beer, *Darwin's Plots*, p. 38.
- 27 *Ibid.*, p. 71.
- 28 Gillian Beer, 'Darwin's Reading and the Fictions of Development', in *The Darwinian Heritage*, ed. David Kohn, p. 561.
- 29 *Origin*, p. 215; Peckham, p. 333; Alvar Ellegård, *Darwin and the General Reader: The Reception of Darwin's Theory of Evolution in the British Periodical Press 1859–1872* (Gothenburg: Elanders Boktryckeri Aktiebolag, 1958), on 'The Bear becoming a Whale', pp. 238–41.
- 30 Quoted in Peckham, *Variorum*, p. 20.
- 31 Peckham, *Variorum*, p. 165.
- 32 James Moore, *The Post-Darwinian Controversies*, p. 127; Robert M. Young, *Darwin's Metaphor*, p. 119.
- 33 Letter to J. D. Hooker, 16 January 1869. Quoted in Hull, *Darwin and His Critics*, p. 302.
- 34 Desmond and Moore point out that the cheaper edition was at the insistence of Darwin himself; at a time when 'working men in Lancashire were clubbing together to buy the fifth at fifteen shillings', Darwin 'wanted them all to have copies' (*Darwin*, p. 582).
- 35 Peter J. Bowler, *Theories of Human Evolution: A Century of Debate, 1844–1944* (Baltimore and London: Johns Hopkins University Press, 1986), p. 2.
- 36 Mayr (ed.), *Origin*, p. ix.
- 37 Thomas Kuhn, *The Structure of Scientific Revolutions* 2nd edition (Chicago: University of Chicago Press, 1970), p. 172.
- 38 Petr Kropotkin, *Mutual Aid: A Factor of Evolution* (1902; Boston: Extending Horizons Books, date unknown), pp. 63–4.
- 39 Henri Bergson, *Creative Evolution* (1911; Trans. Arthur Mitchell. Lanham, MD: University Press of America, 1983), p. 57.
- 40 'Strike out from our sentences everything but nouns and verbs, and there stands displayed the vagueness characterizing undeveloped tongues. Each inflection of a verb, or addition by which the case of a noun is marked, by limiting the conditions of action or of existence, enables men to express their thoughts more precisely ... Again, in the course of its evolution, each tongue acquires a further accuracy through processes which fix the meaning of each word. Intellectual intercourse slowly diminishes laxity of expression. By-and-by dictionaries give definitions. And eventually, among the most cultivated, indefiniteness is not tolerated, either in the terms used or in their grammatical combinations'. Spencer, *First Principles*, pp. 337–8.
- 41 Huxley, 'The Method by which the Causes of the Present and Past Condition of Organic Nature are to be Discovered. – The Origination of Living Beings', in *Man's Place in Nature*, pp. 186–7.
- 42 Darwin to Lyell, 21 August 1861; quoted in Hull, *Darwin and His Critics*, p. 63.
- 43 Edward Manier, *The Young Darwin and his Cultural Circle: A Study of Influences which helped Shape the Language and Logic of the first Drafts of*

- the Theory of Natural Selection* (Dordrecht and Boston: Reidel, 1978). On Dugald Stewart, see especially pp. 37–40.
- 44 'On the *Origin of Species* by Charles Darwin', *Archives des Sciences de la Bibliothèque Universelle* 3 (1860) pp. 231–255 (translated by David. L. Hull), in Hull, *Darwin and His Critics*, p. 142.
- 45 Wollaston, in Hull, *Darwin and His Critics*, pp. 139–140.
- 46 Quoted in Ellegård, *Darwin and the General Reader*, p. 73.
- 47 Jenkin, quoted in Hull, *Darwin and His Critics*, p. 305.
- 48 C.S. Peirce, *Scientific Metaphysics*, vol. VI of *Collected Papers of Charles Sanders Peirce*, eds Charles Hartshorne and Paul Weiss (Cambridge, MA: Belknap Press of Harvard University, 1935). Quoted in Hull, *Darwin and His Critics*, pp. 33–4.
- 49 The phrase used by Adam Sedgwick in accusing Darwin in the *Origin of* deserting the established Baconian methodology of induction; see Hull, *Darwin and His Critics*, pp. 159–66.
- 50 See in particular the work of Adrian Desmond for this specific political context in relation to Darwin and Owen: e.g. *Archetypes and Ancestors: Palaeontology in Victorian London 1850–1875* (Chicago: University of Chicago Press, 1984) and *The Politics of Evolution: Morphology, Medicine and Reform in Radical London* (Chicago: University of Chicago Press, 1989).
- 51 Of Darwin's estimation of the process of the denudation of the Weald at some 300,000,000 years, Jenkin noted: 'The whole calculation savours a good deal of that known among engineers as "guess at the half and multiply by two."' This may be less of a comment on Darwin as a genuine scientist than it is the condescension of the physical sciences to the relatively-nascent biological sciences.
- 52 Moore, 'Socializing Darwinism', in *Science as Politics*, ed. Les Levidow, p. 74 – Moore's phrase follows Engels's emphasis on a language which becomes widely popularised and therefore integrated into the basic ways of seeing of a culture; Donald Fleming, 'Charles Darwin, The Anaesthetic Man', *Victorian Studies* 4 (March 1961), pp. 219–36; Beer, *Darwin's Plots*, pp. 29–30; quoted in Moore and Desmond, *Darwin*, p. 259.
- 53 Manier, *The Young Darwin and His Cultural Circle*, p. 16.
- 54 Hull, *Darwin and His Critics*, p. 54.
- 55 Donald Fleming, 'Charles Darwin, The Anaesthetic Man', p. 233.
- 56 See e.g. L. Robert Stevens, 'Darwin's Humane Reading: The Anaesthetic Man Reconsidered', *Victorian Studies* 26:1 (autumn 1982), pp. 51–63.
- 57 Charles Kay Smith, 'Logical and Persuasive Structures in Charles Darwin's Prose Style', *Language and Style*, III:4 (1970), pp. 243–73; Gillian Beer, "'The Face of Nature": Anthropomorphic Elements in the Language of *The Origin of Species*', in *Languages of Nature: Critical Essays in Science and Literature*, ed. Ludmilla Jordanova (London: Free Association Books, 1986), p. 238.
- 58 James Paradis, 'Darwin and Landscape', in *Victorian Science and Victorian Values: Literary Perspectives*, eds James Paradis and Thomas Postlewait (1981; New Brunswick: Rutgers University Press, 1985).
- 59 William Wordsworth, *The Prelude*, Book II, lines 210–221.
- 60 See e.g. Young, 'Darwin's Metaphor: Does Nature Select?', in *Darwin's*

Metaphor, and Beer, *Darwin's Plots*.

- 61 Letter to Charles Lyell, 1 June 1860; letter to Henry Fawcett, September 1861. Quoted in Hull, *Darwin and His Critics*, pages 229 and 277.
- 62 Ellegård, *Darwin and the General Reader*, pp. 321–2.
- 63 Stanley Edgar Hyman, *The Tangled Bank: Darwin, Marx, Frazer and Freud as Imaginative Writers* (New York: Atheneum, 1962), p. 41.
- 64 Phillip Barrish, 'Accumulating Variation: Darwin's *Origin* and Contemporary Literary and Cultural Theory', in *Victorian Studies* 34 (summer 1991), p. 443.
- 65 Friedrich Nietzsche, *The Genealogy of Morals* (1887), reprinted in *The Birth of Tragedy and the Genealogy of Morals* (New York: Doubleday Anchor, 1956), pp. 178–9.