

DARWIN'S PLOTS

*Evolutionary Narrative in Darwin, George Eliot
and Nineteenth-Century Fiction*

Third Edition

GILLIAN BEER



CAMBRIDGE
UNIVERSITY PRESS

Contents

<i>Foreword by George Levine</i>	page ix
<i>Preface to the first edition</i>	xv
<i>Preface to the second edition</i>	xvii
<i>Preface to the third edition</i>	xxxiii
Introduction	1
I The remnant of the mythical	1
II ‘The second blow’	8
III Problems of knowledge	14
Part I. Darwin’s language	23
1. ‘Pleasure like a tragedy’: imagination and the material world	25
2. Fit and misfitting: anthropomorphism and the natural order	44
Part II. Darwin’s plots	71
3. Analogy, metaphor and narrative in <i>The Origin</i>	73
4. Darwinian myths	97
I Growth and its myths	97
II Growth and transformation	99
III Transformation, retrogression, extinction: Darwinian romance	114
Part III. Responses: George Eliot and Thomas Hardy	137
5. George Eliot: <i>Middlemarch</i>	139
I The vital influence	139
II Structure and hypothesis	148
III The web of affinities	156

6. George Eliot: <i>Daniel Deronda</i> and the idea of a future life	169
7. Descent and sexual selection: women in narrative	196
8. Finding a scale for the human: plot and writing in Hardy's novels	220
9. Darwin and the consciousness of others	242
<i>Notes</i>	256
<i>Select bibliography of primary works</i>	282
<i>Further reading related to Charles Darwin</i>	288
<i>Index</i>	290

Foreword

George Levine

Early in *Darwin's Plots*, Gillian Beer argues that *On the Origin of Species* is 'one of the most extraordinary examples of a work which included more than the maker of it at the time knew, despite all that he *did* know'. With these words Professor Beer initiated an enterprise that itself probably included more than she knew, despite all that she *did* know – which, to say the least, was a lot. For the book remains as alive and important now as it was when it appeared in 1983, on the first crest of the booming 'Darwin Industry', which has in the past fifteen years expanded even beyond the imagination of those who already understood how enormously rich and fertile Darwin's thought remained. Unlike most great scientists of the past, whose work has been absorbed by science (and often by culture) and marked as a brilliant stage toward later developments, Darwin remains strangely and almost charismatically alive – he 'has grown younger in recent years', says Professor Beer – and evolutionary biology remains an active force in science and beyond.

Darwin's Plots identifies a 'remnant of the mythical' in his arguments, a not quite complete fit 'between material and theory', a willingness to fall back on 'unknown laws', a passion for multiplicity and for aberrations. In teaching us how Darwin's metaphors and language work, by refusing any simple placement of his thought, either historical or philosophical, Professor Beer in effect predicted his continuing power to fertilise and disturb.

Darwin's name long ago entered the language to mark off a dog-eat-dog, cruelly competitive world. But, as Beer demonstrates, Darwin's language had shown him as much a believer in cooperation and what Kropotkin called 'mutual aid' as in ruthless competition. Beyond the popular imagination, up through the continuing human interest of the *Beagle* voyage and the continuing worry over the religious implications of evolutionary theory, the sustained interest of scholars and scientists

in his work has made him perhaps the most discussed writer in English besides Shakespeare. Like the language that Professor Beer so brilliantly analyses, Darwin has remained endlessly interpretable, and the work of understanding him and using his ideas has accelerated during the past two decades.

As Professor Beer herself notes, the most impressive achievement of the Darwin industry in that time has been the extraordinary edition of Darwin letters, which to the moment of this writing, through nine volumes, takes us only up to 1861, that is, two years after the publication of *On the Origin of Species*. The notebooks – richly suggestive in their indications of the way Darwin was thinking in the run-up to his great work – have been published. An enormously useful register and summary of all his correspondence is now available. Perhaps most interestingly of all, as a result of the crucial archival work that produced the *Letters*, several notable biographies have appeared, particularly *Voyaging*, by Janet Browne, and *Charles Darwin*, by Adrian Desmond and James Moore. These studies, while refusing anything like the traditional hagiographical approach and while thickening our understanding of Darwin as a creature of his moment and a complex and multiply motivated man, give us a Darwin who might begin to correspond in life to the complex artist/scientist who produced the language that Professor Beer so richly analyses. But, as she rightly notes in addressing the Desmond–Moore biography, her own approach, fastening on the particularities of the complex and remarkably flexible language of Darwin’s texts, undercuts the implication that Darwin was absolutely a man of his time, explicable in terms of the conventions of the middle-class society to which he so nervously and doggedly adhered.

At the same time as the biographical and archival interest in Darwin has intensified, there has been an explosion of interest in Darwinian theory, particularly through evolutionary psychology: Daniel Dennett has pronounced Darwin’s idea ‘dangerous’ in a study that provocatively follows out the line that sees Darwin as unrelentingly and courageously materialist and antimetaphysical. Richard Dawkins has carried the myth of Darwin’s commitment to a pervasively competitive world deep into microbiology with his theory of *The Selfish Gene*. E. O. Wilson and Steven Pinker, prominently among others, take Darwin as the patron saint of sociobiology and evolutionary psychology, which pursue reductionism into the intricacies of human consciousness and behaviour. Each of these writers claims Darwin as his own but in effect together they simply multiply the number of different Darwins his posterity

has created. The Darwin Gillian Beer gives us will not stand still for such unequivocal cooptations. Her new preface gives us some sense of how the approach of *Darwin's Plots* would have handled these later versions of Darwin, would have placed *them* inside the myths of our own culture and of the cultures they presume to transcend, and would have raised the kinds of questions that would make resting in their extreme versions of Darwin impossible. And beyond these struggles, within the limits of yet stricter science, Darwin remains controversial in the continuing combat between palaeontological and microbiological evolutionary biology. Outside of the official confines of science, the Victorian battle between God and Darwinian materialism continues in the attacks of creationism. *Darwin's Plots* prepared us for the tensions within and against Darwinian thought, as it worried the forms of our 'plots', the possibilities of meaning, order, futurity, development, death.

It is a mark of the significance of *Darwin's Plots* that it remains undeniably the single indispensable study of Darwin as a *writer* and as a presence in the language and consciousness of modern literature. Nobody has so rigorously and imaginatively addressed Darwin's work as literature, or so insistently read him as a creative writer, on an imaginative par with Charles Dickens or Thomas Hardy or George Eliot or Virginia Woolf.

Though it is deliberately 'literary' in its approach and sets out to read Darwin as a writer who also happened to be a scientist, it is also thoroughly multidisciplinary. The new preface gives another sharp glimpse of the way Professor Beer's remarkable attention to language extends beyond language into the widest range of intellectual and cultural connections. She demonstrates again that Darwin's language has its significance not merely in its literal meanings, but in the way tone, syntax, semantic substance play against each other and help shape thought and open up more possibilities than it can openly articulate. Such analysis has helped this book outreach the best of literary studies that have followed it, and to anticipate many of the moves made in current studies of Darwin and evolution. It is entirely compatible with the views promulgated by sociologists and historians of science with increasing force after its publication that ideas must be seen in the flesh-and-blood context of the moment of their production. Yet it refuses historical or social reductionism; Professor Beer historicises but she never loses sight of the ramifying possibilities of Darwin's special genius.

Thus she never adopts the extreme position, so prominent in much contemporary history and sociology of science and in cultural studies, that the social provides total explanation – that it is not a matter of

ideas half-perceived, half-created, but of ideas virtually entirely ‘constructed’. She notes bemusedly in the new preface how some people read the book as arguing that science is merely a ‘fiction’. But her point, richly made over and over again, is that the language in which Darwin’s theory is articulated is thick with the culture in which Darwin lived and that fully to understand the ‘science’, one must recognise how the language contributed to it, evoked resistances, entailed compliance. The language and the arguments cannot be disentangled. So the book marks the strenuous, inevitably incomplete resistances of the theory to the cultural forces that shape it. Beer’s study, emphasising the implication of Darwin’s thought in culture, responsibly worries through the question of the degree to which Darwin can be thought of as ‘discoverer’ or as ‘inventor’. Tracing much of Darwin’s thought back to Romantic predecessors, in poetry as well as in science, Professor Beer shows through both argument and enactment that the recognition of the creative and imaginative aspects of science does not in any way diminish the importance or distinctness of scientific work. Though nobody can come away from a reading of the book without a sense that science is thoroughly and crucially (and creatively) inside of culture, every reader must also see that it brilliantly enriches our understanding of our own culture precisely because it enriches our understanding of Darwin and the enormous difficulty of his enterprise.

The distinctiveness of *Darwin’s Plots* even now has not been adequately assimilated into literary study. What distinguished the book, and what continues to distinguish it in literary study, is not only its meticulous attention to Darwin’s language, but a bold and convincing demonstration that Darwin should be read not only as someone whose ideas profoundly influenced his culture, but as someone whose ideas were also importantly shaped by culture. *Darwin’s Plots*, that is to say, indicates that the cultural traffic ran both ways. Finding echoes in Darwin’s writings of Milton (whose works, along with Lyell’s *Principles of Geology* accompanied him everywhere on the *Beagle*), of Wordsworth and Coleridge and Dickens, Professor Beer identifies Darwin as a Romantic materialist and traces the movement of literary language thick with assumptions of intention and agency into arguments that deny those very assumptions.

Earlier interest in Darwin and literature usually manifested itself in the useful work of locating Darwinian ideas moving from him to writers, from science to literature and politics. Some pioneering studies like Lionel Stevenson’s important *Darwin Among the Poets* (1932) focussed

almost entirely on Darwin's 'influence' on later writers. Darwin was a figure difficult to ignore even for the most literary of critics. But while there had been some earlier work that attended to the language of Darwin's books, particularly Stanley Edgar Hyman's *The Tangled Bank* (1962), nobody before Professor Beer had attended so meticulously and learnedly to the texture of Darwin's language and its deep historical roots. Nobody before Professor Beer traced so carefully the constraints of inherited language on the shaping of Darwin's arguments, or recognised the creative implications of his resistance to the traditions he used, or thought through so carefully and yet imaginatively the ways in which his metaphors opened up possibilities and created an argument that included more than the maker of it knew. Darwin's metaphors, Professor Beer argues, 'attempt to press upon the boundaries of the knowable within a human order'. *Darwin's Plots*, then, describes adventures in language and its possibilities, moves from the minute particulars of individual words to a recognition of how Darwin's work transformed the fundamental myths of the culture, myths upon which its language was built and whose vestiges help give Darwin's writing its capacity to escape monolithic impositions of meaning.

'Discourse', Professor Beer claims, 'can never be expunged from scientific enquiry'. Professor Beer's 'discourse' has its own distinctive and really inimitable qualities. *Darwin's Plots* marks the emergence of an unmistakable critical voice that speaks with authority and grace across a broad range of intellectual disciplines. Its strength comes in part from an unusual angularity, its capacity to evoke unexpected meanings and connections, to point toward multiplicity and contradiction. Beer's prose both entices and, one might say in a Beerism, disequilibrates: it makes it impossible for readers to relax, for it forces them to see that language does not hold still, neither Darwin's nor her own. Her words are never casual and serve not only the obvious utilitarian effect of getting it right but of getting it right in ways that expand possibilities and intimate abundance; they press to a broader realisation of how much might emerge from a creative imagination watching the play of words shifted from context to context. Such shifting is not only a function of the self-conscious human perceiver; it is the (Darwinian) way of the world. The seductive strenuousness of Beer's prose derives from her sense of the relentless fluidity of language and experience, the multiple possibilities of relationships, between ideas, people, cultures, disciplines.

This is the voice that makes *Darwin's Plots* one of the indispensable critical works of the past two decades and that accounts for its remarkable

capacity to open out into the intellectual struggles over Darwin, Darwinism, science and culture which followed in the years after first publication of the book. While in her new preface Professor Beer suggests ways in which she might have changed the book were she to be writing it now, what we have needs no alteration, in part because, like the Darwinian language Professor Beer explores, it suggests more than it can literally say. Professor Beer has set the standard for how to read Darwin and how to connect his amazing enterprise to the stories our culture has been able to tell itself, and continues to tell. She has shown that the language of Darwin's arguments is 'not a layer that can be skimmed off without loss'. *Darwin's Plots* takes us through that language into the cultural centres of Darwin's thinking and into a recognition of the ways in which it continues to proliferate and to enrich us.

Introduction

I THE REMNANT OF THE MYTHICAL

Most major scientific theories rebuff common sense. They call on evidence beyond the reach of our senses and overturn the observable world. They disturb assumed relationships and shift what has been substantial into metaphor. The earth now only *seems* immovable. Such major theories tax, affront, and exhilarate those who first encounter them, although in fifty years or so they will be taken for granted, part of the apparently common-sense set of beliefs which instructs us that the earth revolves around the sun whatever our eyes may suggest. When it is first advanced, theory is at its most fictive. The awkwardness of fit between the natural world as it is currently perceived and as it is hypothetically imagined holds the theory itself for a time within a provisional scope akin to that of fiction. Throughout the 1850s and well into the 1860s, for example, evolutionary theory was commonly referred to as ‘the Development Hypothesis’.

In *The Structure of Scientific Revolutions* Kuhn discusses this phase in the conception and reception of a new scientific idea:

Discovery commences with the awareness of anomaly, i.e. with the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science. It then continues with a more or less extended exploration of the area of anomaly. And it closes only when the paradigm theory has been adjusted so that the anomalous becomes the expected. Assimilating a new sort of fact demands a more than additive adjustment of theory, and until that adjustment is completed – until the scientist has learned to see nature in a different way – the new fact is not quite a scientific fact at all.¹

A hundred years earlier Claude Bernard in his *Cahier Rouge* had noted that science proceeds by revolution and not by addition pure and simple.² This revolution must take place not only in the minds of scientists but in the beliefs of other inhabitants of the same culture if the theory

is to reach its full authority – an authority which rests upon an accepted congruity between theory and nature. The willed, half-consciously fictive and incomplete nature of hypothesis is touched on by Mackay in *The Progress of the Intellect* which George Eliot reviewed for the *Westminster Review* in January 1851. She there chose the following passage from his chapter ‘The Mediation of Philosophy’ as part of an extract to show him at his best. Mackay is arguing about the relationship between myth and science:

A remnant of the mythical lurks in the very sanctuary of science. Forms or theories ever fall short of nature, though they are ever tending to reach a position above nature, and may often be found to include more than the maker of them at the time knew.³

In its imaginative consequences for science, literature, society and feeling, *The Origin of Species*⁴ is one of the most extraordinary examples of a work which included more than the maker of it at the time knew, despite all that he *did* know.

In this study I shall explore some of the ways in which evolutionary theory has been assimilated and resisted by novelists who, within the subtle enregisterment of narrative, have assayed its powers. With varying degrees of self awareness they have tested the extent to which it can provide a determining fiction by which to read the world. The book is concerned with Victorian novelists living, in relation to evolutionary theory, in the phase when ‘a fact is not quite a scientific fact at all’ and when ‘the remnant of the mythical’ is at its most manifest. I shall analyse works by writers as various in their responses as Kingsley, George Eliot and Hardy. But evolutionary ideas are even more influential when they become assumptions embedded in the culture than while they are the subject of controversy. As Barry Barnes writes in *Scientific Knowledge and Sociological Theory*:

A successful model in science frequently moves from the status of an ‘as if’ theory to a ‘real description’. From here it may develop into a cosmology, before eventual disintegration into a mass of techniques and procedures, wherein what were key theoretical conceptions become mere operators, the ontological status of which is scarcely given a thought, (c.f. force, temperature, frequency).⁵

That process of naturalisation is the other major topic of my enquiry. We pay Darwin the homage of our assumptions. Precisely because we live in a culture dominated by evolutionary ideas, it is difficult for us to recognise their imaginative power in our daily readings of the world. We need to do so.

In the earlier chapters of this study I shall analyse some of the problems Darwin faced in precipitating his theory as language. He sought to appropriate and to recast inherited mythologies, discourses, and narrative orders. He was telling a new story, against the grain of the language available to tell it in. And as it was told, the story itself proved not to be single or simple. It was, rather, capable of being extended or reclaimed into a number of conflicting systems.⁶

In speaking of evolutionary theory I take as my focus the work of Darwin, though in the course of my argument I shall give some account of other writers such as Lamarck, Lyell, and Robert Chambers whose earlier writings had contributed to the acceptance of evolutionary ideas.⁷ I concentrate on Darwin partly because his appreciation of the means through which change, development, and extinction of species took place was to revolutionise our understanding of natural order (though when his book first came out it was not immediately obvious to all that his work did more than substantiate and give authority to ideas already current). A second reason for focusing sharply on *The Origin of Species* is that it was widely and thoroughly read by his contemporaries. Reading *The Origin* is an act which involves you in a narrative experience. The experience may seem to diverse readers to be tragic (as postulated by Jacques Barzun) or comic (as Dwight Culler argues) but it is always subjective and literary.⁸

Related to this question of focus is another, of evidence. Perhaps I can best express it by an analogy. We now live in a post-Freudian age: it is impossible, in our culture, to live a life which is not charged with Freudian assumptions, patterns for apprehending experience, ways of perceiving relationships, even if we have not read a word of Freud, even – to take the case to its extreme – if we have no Freudian terms in either our active or passive vocabulary. Freud sufficiently disrupted all possible past patterns for apprehending experience and his ideas have been so far institutionalised that even those who query his views, or distrust them, find themselves unable to create a world cleansed of the Freudian. This was the nature also of Darwin's influence on the generations which succeeded him. Everyone found themselves living in a Darwinian world in which old assumptions had ceased to *be* assumptions, could be at best beliefs, or myths, or, at worst, detritus of the past. So the question of who read Darwin, or whether a writer had read Darwin, becomes only a fraction of the answer. The related question of whether the reader had read Darwin turns out also to have softer edges than might at first appear. Who had read what does not fix limits. On

the face of it, then, a very generous use of evidence would have been possible for this study, which would see it as inevitable that all writers were affected by such theory. This would have permitted me to point out analogies of theme and order in almost anyone I chose.⁹ But although I do not believe that this would be an improper enterprise, it seems to me to be in one sense an insufficient one, because it does not take account of the *act of reading* and reaction.

Reading creates uncertainty as well as satisfaction. As Richard Ohmann remarks:

The very act of predication is an emotional act, with rhythms of its own. To state something is first to create imbalance, curiosity, where previously there was nothing, and then to bring about a new balance. So prose builds on the emotional force of coming to know, of pinning down part of what has previously been formless and resolving the tensions which exist between the human organism and unstructured experience.¹⁰

One's relationship to ideas depends significantly on whether one has read the works which formulate them. Ideas pass more rapidly into the state of assumptions when they are *unread*. Reading is an essentially question-raising procedure. This is one reason why in this study I have limited close discussion to the work of novelists whom we know to have read Darwin, and usually Lyell, Spencer and Huxley as well. I want to track the difficult flux of excitement, rebuttal, disconfirmation, pursuit, forgetfulness, and analogy-making, which together make up something of the process of assimilation.

In the mid-nineteenth century, scientists still shared a common language with other educated readers and writers of their time. There is nothing hermetic or exclusive in the writing of Lyell or Darwin. Together with other scientific writers such as G. H. Lewes, Claude Bernard, John Tyndall, W. K. Clifford, and even so far as his early work is concerned Clerk Maxwell (writers whose works ranged through psychology, physiology, physics and mathematics), they shared a literary, non-mathematical discourse which was readily available to readers without a scientific training. Their texts could be read very much as literary texts. In our own century scientific ideas tend to reach us by a process of extrapolation and translation. Non-scientists do not expect to be able to follow the mathematical condensations of meaning in scientific journals, and major theories are more often presented as theorems than as discourse. We unselfconsciously use the term 'layman' to describe the relationship of a non-scientist to the body of scientific knowledge. The

suggestion of a priestly class and of reserved, hermetic knowledge goes mostly unremarked. In the mid-nineteenth century, however, it was possible for a reader to turn to the primary works of scientists as they appeared, and to respond directly to the arguments advanced. Moreover, scientists themselves in their texts drew openly upon literary, historical and philosophical material as part of their arguments: Lyell, for example, uses extensively the fifteenth book of Ovid's *Metamorphoses* in his account of proto-geology, Bernard cites Goethe repeatedly, and – as has often been remarked – Darwin's crucial insight into the mechanism of evolutionary change derived directly from his reading of Malthus's essay *On Population*. What has gone unremarked is that it derived also from his reading of the one book he never left behind during his expeditions from the *Beagle*: *The Poetical Works of John Milton*.¹¹ The traffic, then, was two-way. Because of the shared discourse not only *ideas* but metaphors, myths, and narrative patterns could move rapidly and freely to and fro between scientists and non-scientists: though not without frequent creative misprision.

The second premise of my argument is that evolutionary theory had particular implications for narrative and for the composition of fiction. Because of its preoccupation with time and with change evolutionary theory has inherent affinities with the problems and processes of narrative. 'There is not one great question relating to the former changes of the earth and its inhabitants into which considerations of time do not enter,' wrote Lyell in *The Principles of Geology* (1830, I:302).¹² And although Lyell at this time still believed in the fixity of species his exploration of an infinitely extended time-scale for the earth was one of the necessary preconditions of later theory. When Lyell wanted to point out how too short an imagined time-scale had misled geologists into a catastrophist view of the past, he did it by invoking the metaphor of romance time as opposed to historical time:

How fatal every error as to the quantity of time must prove to the introduction of rational views concerning the state of things in former ages, may be conceived by supposing that the annals of the civil and military transactions of a great nation were perused under the impression that they occurred in a period of one hundred instead of two thousand years. Such a portion of history would immediately assume the air of a romance; the events would seem devoid of credibility, and inconsistent with the present course of human affairs. A crowd of incidents would follow each other in thick succession. Armies and fleets would appear to be assembled only to be destroyed, and cities built merely to fall in ruins. (I:78–9)

As in *Tristram Shandy*, the pace of record and of event are here fatally at odds. Uncle Toby and Trim must build up and knock down their fortifications within the hour to catch up with the events in France. Geologists, too parsimonious of time, are obliged to imagine a world governed by catastrophic events which prepare for present tranquillity.

Evolutionary theory is first a form of imaginative history. It cannot be experimentally demonstrated sufficiently in any present moment. So it is closer to narrative than to drama. Indeed in the then current state of genetic knowledge many of the processes of inheritance were beyond explanation. The rediscovery of Mendel's experiments took place after Darwin's death. It took a century before the discovery of DNA demonstrated the organism as a structural narrative programmed to enact itself through time.¹³ Evolutionary ideas proved crucial to the novel during that century not only at the level of theme but at the level of organisation. At first evolutionism tended to offer a new authority to orderings of narrative which emphasised cause and effect, then, descent and kin. Later again, its eschewing of fore-ordained design (its dysteleology) allowed chance to figure as the only sure determinant. On the other side, the organisation of *The Origin of Species* seems to owe a good deal to the example of one of Darwin's most frequently read authors, Charles Dickens, with its apparently unruly superfluity of material gradually and retrospectively revealing itself as order, its superfecundity of instance serving an argument which can reveal itself only *through* instance and relations.

Evolutionary ideas shifted in very diverse ways the patterns through which we apprehend experience and hence the patterns through which we condense experience in the telling of it. Evolutionism has been so imaginatively powerful precisely because all its indications do not point one way. It is rich in contradictory elements which can serve as a metaphorical basis for more than one reading of experience: to give one summary example – the 'ascent' or the 'descent' of man may follow the same route but the terms suggest very diverse evaluations of the experience. The optimistic 'progressive' reading of development can never expunge that other insistence that extinction is more probable than progress, that the individual life span is never a sufficient register for change or for the accomplishment of desire, an insistence which has led one recent critic to characterise Darwinian theory as a myth of death.¹⁴

Darwinian theory will not resolve to a single significance nor yield a single pattern. It is essentially multivalent. It renounces a Cartesian clarity, or univocality. Darwin's methods of argument and the generative

metaphors of *The Origin* lead, as I shall demonstrate later, into profusion and extension. The unused, or uncontrolled, elements in metaphors such as ‘the struggle for existence’ take on a life of their own. They surpass their status in the text and generate further ideas and ideologies. They include ‘more than the maker of them at the time knew’. The world Darwin proposes can be felt as either plenitude or muddle. Darwin was much wounded by Herschel’s description of his theory as ‘the law of higgledy-piggledy’,¹⁵ but the phrase exactly expresses the dismay many Victorians felt at the apparently random – and so, according to their lights, trivialised – energy that Darwin perceived in the natural world.

Darwinian theory takes up elements from older orders and particularly from recurrent mythic themes such as transformation and metamorphosis. It retains the idea of *natura naturans*, or the Great Mother, in its figuring of Nature. It rearranges the elements of creation myths, for example substituting the ocean for the garden but retaining the idea of the ‘single progenitor’ – though now an uncouth progenitor hard to acknowledge as kin. It foregrounds the concept of kin – and aroused many of the same dreads as fairy-tale in its insistence on the obligations of kinship, and the interdependence between beauty and beast. Many Victorian rejections of evolutionary ideas register a physical shudder. In its early readers one of the lurking fears it conjured was miscegeny – the frog in the bed – or what Ruskin called ‘the filthy heraldries which record the relation of humanity to the ascidian and the crocodile’.¹⁶ In its insistence on chance as part of a deterministic order it perturbed in the same mode as *The Arabian Nights* – though more profoundly, because claiming the authority of science not exotic fiction. The pip thrown over the shoulder strikes the Grand Genie and vengeance ensues. Such tales – and *The Arabian Nights* was at the height of its imaginative influence at that period so that, for example, we find George Eliot one evening enjoying ‘music, *Arabian Nights*, and Darwin’ – rouse some of the same elated dread as the idea of minute random mutations with their uncontrollable consequences.¹⁷ But Darwin’s theories did not pleasurably assuage the dreads.

One of the persistent impulses in interpreting evolutionary theory has been to domesticate it, to colonise it with human meaning, to bring man back to the centre of its intent. Novelists, with their particular preoccupation with human behaviour in society, have recast Darwin’s ideas in a variety of ways to make them seem to single out man. In *The Origin of Species* (1859) man is a determining absence, for reasons that I

shall analyse in the succeeding chapters. In *The Descent of Man* (1871) man in all his varieties is the topic. The first is a work primarily of biology, the second of anthropology: together they form the substantial statement of Darwin's published views on evolution. Darwin's is a theory of descent as well as of adaptation: in *The Origin* he concentrated on the mechanism of 'natural' (that is, non-human and unwilling) 'selection' in creating change. In *The Descent*¹⁸ he concentrates on the powers of sexual selection: this concentration brings back into the discussion the ideas of will and culture which are notably and deliberately excluded in *The Origin*. Women and men became his problem.

The power of Darwin's writing in his culture is best understood when it is seen not as a single origin or 'source', but in its shifting relations to other areas of study. As Darwin's notebooks, reading-lists, library, and annotations all show, he was immensely alive to concurrent work in a range of disciplines, including not only other directly scientific work but history, historiography, race-theory, psychology, and literature. The problems raised by his writing often manifest themselves most acutely when they are transferred into another field. Equally, his work was profoundly affected by common concerns. An ecological rather than a patriarchal model is most appropriate, therefore, in studying his work.

Darwinian theory has, then, an extraordinary hermeneutic potential – the power to yield a great number of significant and various meanings. In the course of this study I shall show how differing individual and cultural needs have produced deeply felt, satisfying, but contradictory interpretations of its elements. It is, therefore, important at the outset to emphasise that it cannot be made to mean *everything*. Disraeli's satire on Chambers's *Vestiges of Creation*, in *Tancred* where it is renamed 'The Revelations of Chaos', could not apply to Darwin.¹⁹ Of 'The Revelations of Chaos' it is said: 'It explains everything, and is written in a very agreeable style.' Darwinian theory, on the contrary, excludes or suppresses certain orderings of experience. It has no place for *stasis*. It debars return. It does not countenance absolute replication (cloning is its contrary), pure invariant cycle, or constant equilibrium. Nor – except for the extinction of particular species – does it allow either interruption or conclusion.

II 'THE SECOND BLOW'

In 'A Difficulty in the Path of Psycho-Analysis' (1917) Freud comments that 'the universal narcissism of men, their self-love, has up to the present

suffered three severe blows from the researches of science'. These three blows he names the *cosmological*, associated with Copernican theory, the *biological*, associated with Darwinian theory, and the *psychological*, associated with psychoanalytic theory.

In the course of the development of civilization man acquired a dominating position over his fellow-creatures in the animal kingdom. Not content with this supremacy, however, he began to place a gulf between his nature and theirs. He denied the possession of reason to them, and to himself he attributed an immortal soul, and made claims to a divine descent which permitted him to break the bond of community between him and the animal kingdom . . . We all know that little more than half a century ago the researches of Charles Darwin and his collaborators and forerunners put an end to this presumption on the part of man. Man is not a being different from animals or superior to them; he himself is of animal descent, being more closely related to some species and more distantly to others.²⁰

Freud's formulation of man's dilemma is itself mythopoeic. (Joan Riviere's earlier translation further emphasises this by rendering the 'three blows' as the 'three wounds'.) He reserves to himself the position of youngest brother in this trio of giants (Copernicus, Darwin, Freud), inflicting a double blow: 'The third blow, which is psychological in nature, is probably the most wounding':

these two discoveries – that the life of our sexual instincts cannot be wholly tamed, and that mental processes are in themselves unconscious and only reach the ego and come under its control through incomplete and untrustworthy perceptions – these two discoveries amount to a statement that *the ego is not master in its own house*. Together they represent the third blow to man's self-love . . .²¹

Freud's assertion arrests history. The magical number three belies the possibility of a fourth great wound. Comte had used a similar absolutist numerology in his account of human thought and civilisation, an account whose influence was felt throughout the second half of the nineteenth century:²² first the theological stage, then the metaphysical, and now the positive. This coming to rest in the number three, endowing the present with a special authority and permanence, is evident in many nineteenth-century orderings of knowledge. Claude Bernard described the three phases of the history of medicine, according to a system which clearly draws on Comte, as the theological, the empirical and the scientific. T. H. Huxley, in his lectures on Evolution, asserts, 'There are three hypotheses which may be entertained, and which have been entertained, respecting the past history of life upon the globe.' The first is that:

living beings, such as now exist, have existed from all eternity upon this earth . . . the second hypothesis . . . I termed the Miltonic hypothesis . . . according to the third hypothesis, or that of evolution, the existing state of things is the last term of a long series of states, which, when traced back, would be found to show no interruption and no breach in the continuity of natural causation.²³

For Huxley the present state of things is 'the last term' and even Marx, in whose system eschatology and the future are essential, uses the same triple ordering of history which in most such systems stills the past into the present order.

These examples show one of the difficulties on the path of evolutionary theory. It is a theory which does *not* privilege the present, which sees it as a moving instant in an endless process of change. Yet it has persistently been recast to make it seem that all the past has been yearning towards the present moment and is satisfied now. Since Freud wrote, one might argue, quantum physics has dealt another and yet more radical blow at man's narcissism because it has brought into question the fixed causal relations, 'the continuity of natural causation' which underpinned, in particular, nineteenth-century scientific explanation and, more generally, the activities of human reason.

Freud's formulation, however, pinpoints two particular elements in mid-nineteenth-century creative experience. One was the absence of an analytical and denotative vocabulary for describing the activities of the unconscious and subconscious. This meant that it remained possible to believe that the ego was master in its own house, capable of choice, command and control. At the same time there was a growing fascination with the reaches of experience beyond the domain of reason, a fascination which expressed itself in that oceanic richness in the use of symbol typical of Victorian prose. Symbol and metaphor, as opposed to analysis, can allow insight without consequences because perceptions are not stabilised and categorised. They allow us fleetingly to inhabit contradictory experience without moralising it. The Victorians were free from that rapid awareness of what images signify, which may, and in a post-Freudian world frequently does, hamper impulse and expression. Freud himself acknowledged the extent to which he had been educated towards analysis by Victorian fiction, and although mid-Victorian writers may not have been fully aware of the approaching *Götterdämmerung* for autonomous egos, they shared with Freud much of the same historical experience.

Crucial to that common historical experience was the weight of Darwin's blow. It is hard to overestimate the imaginative turmoil brought

about by evolutionary theory, beginning in England already in the 1830s with the publication of Lyell's *Principles of Geology*, continuing in the 1840s with the publication of Robert Chambers's anonymously published and immensely popular work *Vestiges of the Natural History of Creation*, and concentrated in 1859 by Darwin's long-ruminated and rapidly written argument, *On The Origin of Species By Means of Natural Selection, or the Preservation of Favoured Races in the Struggle For Life*. Alongside the primarily natural-historical discussion, and pressing upon it conceptually, went the theories of the development of knowledge and society articulated by Auguste Comte and Herbert Spencer.²⁴ And behind this crisis of ideas lay, as Samuel Butler was soon and irascibly to point out,²⁵ the work of earlier development theorists such as Buffon, Lamarck, and Erasmus Darwin. As always, behind the theoretical culmination there lay also a long history of *glimpsed* half-formulated or locally pursued evolutionist perceptions which have been thoroughly studied by historians of science.²⁶ The debate between constancy and transmutation of species had been mooted throughout the eighteenth century, and was part of a much older debate about the constancy and transformation of matter which went back to Lucretius. The word 'evolution' itself is comparatively recent.²⁷ For example, like so much else, it appears in *Tristram Shandy*, where though championed by Uncle Toby it is treated as a nonce word:

'Kingdoms and provinces, and towns and cities, have they not their periods? and when these principles and powers, which at first cemented and put them together, have performed their several evolutions, they fall back'. – Brother Shandy, said my uncle Toby, laying down his pipe at the word *evolutions* – Revolutions. I meant, quoth my father – by heaven! I meant revolutions, brother Toby – evolutions is nonsense. – 'Tis not nonsense – said my uncle Toby.²⁸

During the eighteenth century, when the word was used, it meant the stages through which a living being passes in the course of its development from egg to adult. That is, it gives an account of a single life span and remains within the pale of individual development. The term for this in biology is ontogeny. But evolutionary theory challenged the single life span as a sufficient model for understanding experience. In the 1830s the word evolution was used for the first time to describe the development of the *species* rather than of the individual. For this the biological term is phylogeny. Etienne Geoffroy Saint-Hilaire is credited with its first use in the *Mémoire sur les sauriens de Caen*, 1831; Lyell used it in English in the following year, in the second volume of *Principles of*

Geology. The blurring of the distinction between ontogeny – individual development – and phylogeny – species development – in the single term ‘evolution’ proved to be one of the most fruitful disturbances of meaning in the literature of the ensuing hundred years, and is a striking example of the multivalency of evolutionary concepts.

The term ‘evolution’ only gradually acquired dominance. In French the word ‘transformisme’ for a long time supplied its place. ‘Transformisme’ emphasises the activity not only of process but of transformation. Transformation was at once the most verifiable and the most magical aspect of evolutionary ideas. Transformation within the single life span presents some of the most amazing observable phenomena of nature. Whereas ‘transformisme’ need not imply a progressive pattern to experience, the Development Hypothesis did suggest progress and improvement. Transformation might involve either progression or retrogression, and could give almost as much emphasis to the possibilities of degeneration as to those of improvement. What it could not fully include was the idea of extinction, since transformation suggests a constant process more like that of thermodynamics. Indeed it is striking that both theories share the emphasis upon process and transformation despite the divergence of their emphasis when it comes to the matter of order and confusion. Evolutionary theory appeared to propose a more and more complex *ordering*, while the second law of thermodynamics emphasises the tendency of energy systems towards disorder.

Yet in his observation of the reckless powers of individuation Darwin saw the source not only of creativity but of loss. Evolutionary theory emphasised extinction and annihilation equally with transformation – and this was one of its most disturbing elements, one to which gradually accrued a heavier and heavier weight in consciousness.

But despite the diverse emotional implications of its various related ideas, it is its ability to propose a total system for understanding the organisation of the natural world which has been its most powerful influence. The all-inclusiveness of its explanation, stretching through the differing orders of the natural world, seemed to offer a means of understanding without recourse to godhead. It created a system in which there was no need to invoke a source of authority outside the natural order: in which instead of foreknown design, there was inherent purposiveness. Its order welcomed difference, plenitude, multifariousness so that the exigencies of the environment were persistently controverted by the genetic impulse towards variety and by the multiformity of environmental responses as well. Evolutionary theory created a system

which could not be resolved into a simple mathematical elegance. Profusion is a necessary component of its explanation. Selection is crucial also but it is a selection relying on hyperproductivity, upon a fertility beyond use or number. So the three elements of its style of explanation – its inclusiveness, its simplicity, its dependence on profusion and variety – did not all incline the same way: they left room for diverse dispositions of its all-encompassing form. This diversity of implication, its spawning of metaphorical applications, helps to account for the rapid assimilation of evolutionary ideas and the speed with which they occur as assumptions, rather than as propositions. The unexamined and diminished use of the evolutionary metaphor can be encountered all around us now and, as Barnes remarks, the ontological status of its key concepts is scarcely given a thought.

The shape and implications of powerful ideas often become fully discernible only when a reaction against them has set in. We have reached such a point, perhaps, with evolutionism. The reaction has been against the displacement of evolutionary concepts into fields of study other than those to which it originally applied, rather than against its importance to biological theory itself though socio-biology and recent genetic theory have raised questions about the accuracy or sufficiency of Darwin's work. During the past hundred years or so evolutionary theory has functioned in our culture like a myth in a period of belief, moving effortlessly to and fro between metaphor and paradigm, feeding an extraordinary range of disciplines beyond its own original biological field. In the later nineteenth century it gave ordering assumptions to the developing subjects of anthropology, sociology and psychology and elements in its ideas have been appropriated to serve as confirming metaphors for beliefs politically at odds with those of Darwin himself, such as social Darwinism, and even – through a displaced eugenic argument – a nightmare acting-out of 'artificial selection' in Nazism.

The concepts of evolutionary theory have shifted the weight of words in common use: words like development, generation, variety, inheritance, individuals, kinship, transformation. They have brought into ordinary speech words like mutation and extinct. One purpose of this study is to restore the elements of debate implicit in words like inheritance in nineteenth-century fiction, to show the fullness of impulse and counter-impulse compressed in vocabulary or skinned out in narrative order without necessarily ever manifesting itself as theme.

Evolutionary and biological patterns are currently posited for a variety of human activities and enquiries, often by way of submerged

metaphor: take for example the title of Otto Jespersen's *Language, Its Nature, Development and Origin* or Propp's *Morphology of the Folk-Tale* with its opening claim: 'it is possible to make an examination of the forms of the tale which will be as exact as the morphology of organic formations', or even, a recent title, *The Evolution of National Insurance in England*. In literary theory we find Northrop Frye, in *Fables of Identity*, wishing for a co-ordinating 'principle' for literary criticism which would afford, it seems, something like a theological unity:

I suggest that what is at present missing from literary criticism is a co-ordinating principle, a central hypothesis which, like the theory of evolution in biology, will see the phenomena it deals with as parts of a whole. Such a principle, though it would retain the centripetal perspective of structural analysis, would try to give the same perspective to other kinds of criticism too.

The first postulate of this hypothesis is the same as that of any science, the assumption of total coherence.²⁹

Derrida and Macherey share a fascinated repudiation of 'origins' and of that centripetal search for total coherence which is in itself a tribute to the surviving power of such organisations. The all-inclusiveness of evolutionary theory is the quality that attracts Frye, because it holds out the promise of system. Evolution has within itself the concomitant ideas of development and energy, and has loosely acquired those of improvement and progress.

So despite its tendency to undermine, the evolutionary metaphor has become also a means of confirming our value, suggesting that we inherit the world at its pinnacle of development and are the bearers of a progressive future. The apparent historical determinism of evolutionary ideas loosely applied, moreover, tends to justify society as it now is, as a necessary phase in progress. The idea of development makes it seem that all past has constantly aspired towards becoming our present. One sees this for example in that literary criticism which praises writers of the past for 'an almost modern' understanding of problems, or looks on *emergence* as the process most worth studying. Teleology is restored in such instances in the guise of historical design, a design which reaches its point of satisfaction in the present.

III PROBLEMS OF KNOWLEDGE

New organisations of knowledge are particularly vexatious when they shift man from the centre of meaning or set him in a universe not

designed to serve his needs. In the mid-nineteenth century Darwinian theory issued just such a double challenge. It suggested that man was not fully equipped to understand the history of life on earth and that he might not be central to that history. He was neither paradigm nor sovereign. Man's indefatigable zeal in designing explanations of phenomena which would place him at the centre of reference was seen, indeed, by some of the most creative scientists of the period as the major stumbling block to the advance of knowledge.

Four hundred years earlier the congruity of man and universe had been to a scientist such as Paracelsus the deepest order, and vital to all explanation:

Consider how great and noble man was created, and what greatness must be attributed to his structure! No brain can fully encompass the structure of man's body, the extent of his virtues; he can be understood only as an image of the macrocosm, of the Great Creature. Only then does it become manifest what is in him. For what is outside is also inside, and what is not outside man is not inside. The outer and the inner are *one* thing, *one* constellation, *one* influence, *one* concordance, *one* duration . . . *one* fruit. (I/8, 160)³⁰

The same tradition of explanation underlies the poem 'Man'. For George Herbert, writing in the seventeenth century, man was the highest intensification of the natural order:

For Man is ev'ry thing,
And more: He is a tree, yet bears more fruit;
A beast, yet is, or should be more:
Reason and speech we onely bring.

He continues the Paracelsian idea of universal analogy:

Man is all symmetric,
Full of proportions, one limb to another,
And all to all the world besides:
Each part may call the furthest, brother:
For head with foot hath private amities,
And both with moons and tides.

In a play on the word 'kind' Herbert both emphasises the benign ordering of the natural world in man's favour ('All things unto our flesh are kinde') and then extends and shifts the balance of implication in the run-on of sense into the next line:

All things unto our flesh are kinde
In their descent and being; to our minde
In their ascent and cause.

The initial anthropocentric sense of the attentiveness of the world to man extends into a recognition of universal kinship. All things are kin through their descent. The second half of the declaration reemphasises the congruity, the universally knowable quality of natural order 'to our minde'. All things come from the one cause – the mind of God. The speed with which a word like 'kind' can move on its axis in Herbert's compressed and precise language suggests a readiness to acknowledge kinship, but this readiness in turn depends upon a faith that all such interconnection proceeds from God, who places man at the interpretative centre. Though Herbert's lines sound almost proto-evolutionary in their democratic emphasis upon kinship through descent, what Darwin calls the hidden bond of community of descent, his poem celebrates the peculiar fitness and completeness of man for the highest place within a natural hierarchy. Man alone perceives and communicates God's analogical ordering of the world ('reason and speech we onely bring'). Man's unique claims to reason and to speech were also later to become issues of debate.³²

To Emerson, still, writing in the 1830s, the whole of nature was a metaphor of man's mind. For the theologian Feuerbach in the 1840s the origin of all significance was man. But to the geologist Charles Lyell man's preoccupation with himself had distorted past records of the earth and obscured the laws underlying occurrences:

It is only within the last century and a half, since Hooke first promulgated his views respecting the connexion between geological phenomena and earthquakes, that the permanent changes effected by these convulsions have excited attention. Before that time, the narrative of the historian was almost exclusively confined to the number of human beings who perished, the number of cities laid in ruins, the value of property destroyed, or certain atmospheric appearances which dazzled or terrified the observers. (*Principles of Geology*, II,399)

In *The Origin of Species* Darwin, with an echo of Ecclesiastes, emphasises that man is unfitted by the shortness of his span either to recognise the great extensions of change in the natural world or to effect change himself: 'How fleeting are the wishes and efforts of man! how short his time! and consequently how poor will his products be, compared with those accumulated by nature during whole geological periods' (133). Claude Bernard, the great French physiologist and methodologist, opens his *Introduction à l'étude de la médecine expérimentale* (1865) by pointing out how narrow are the limits of observation within which man's contracted senses permit him to work. Because we do not recognise the constraints of our perceptions we tend constantly to misjudge what we observe.

‘Man is not able to observe the phenomena which surround him, except within very narrow limits; most of them naturally evade his senses, and observation alone will not suffice’ (my translation). Bernard sees man as essentially proud and metaphysical, expecting the ‘ideal creations of his intelligence, which correspond to his feelings, to represent reality as well’. He argues that, on the contrary, ‘man does not possess within him the knowledge and the criterion of things outside himself’. According to Bernard’s formulation, man is blind to the extent of the *present*, the phenomena by which he is laterally surrounded and which lie just beyond the activity of his unaided senses. Evolutionary theory emphasises human unawareness of the *past* and obliges us to study a world from whose history we are largely absent. We must survey an antiquity in which we have no place. Lyell moreover rebukes us for ‘our habitual unconsciousness that our position as observers is essentially unfavourable’ (I,81).

Lyell, and later Darwin, demonstrated in their major narratives of geological and natural history that it was possible to have plot without man – both plot previous to man and plot even now regardless of him.

Even now, the waters of lakes, seas, and the great ocean, which teem with life, may be said to have no immediate relation to the human race – to be portions of the terrestrial system of which man has never taken, nor ever can take, possession, so that the greater part of the inhabited surface of the planet remains still as insensible to our presence as before any isle or continent was appointed to be our residence. (I,158)

The living world is neither entirely open to man’s observation nor related to him. He has not taken possession of its meaning. He can no longer, like Adam, confidently name his subjects.

Evolutionary theory was both threatening and exhilarating not simply as a result of its novelty but because so many of the problems concerning development were in human terms *old* problems: chance, environment, death, survival. And even, in part, because the solutions it proposed were not entirely new. Darwin’s hypotheses gave, as G. H. Lewes put it, ‘articulate expression to the thought which had been inarticulate in many minds’, though Darwin himself was irritated by the readiness of his contemporaries to claim this after the event.

No work of our time has been so general in its influence. This extent of influence is less due to the fact of its being a masterly work, enriching Science with a great discovery, than to the fact of its being a work which at once clashed against and chimed with the two great conceptions of the world that have ruled, and still rule, the minds of Europe.³³

Lewes names these two conceptions of the world as the Monistic and the Dualistic. Darwin was, in Lewes's view, on the side of the Monists which 'reduces all phenomena to community, and all knowledge to unity' whereas the Dualistic conception is one which 'in phenomena separates and opposes Force and Matter, Life and Body, and which in knowledge destroys unity by its opposition of Physical and Final causes'. Darwin saw the natural world in terms of an 'inextricable web of affinities' (*The Origin of Species*, ch. XIII, p. 415) but he also distinguished stringently between 'real affinities' and the analogical. The emphasis on community and unity in Lewes's reading of Darwin's views takes up the element of interrelatedness in Darwin's thinking about phenomena. But it does not sufficiently register the *independence* of phenomena one from the other, the extent to which proximity rather than co-operation may be the dynamic of interchange.

In *The Origin* Darwin concentrated on the role of the mechanism of 'natural selection' in producing change. The fitness of an individual organism to its environment increases the chance of survival of individuals with specific characteristics and of those of their descendants who inherit these characteristics. But the environment is not monolithic and stable: it is itself a matrix of possibilities, the outcome of multiple interactions between organisms and within matter. We tend to think of the individual organism as dynamic and the environment as static – but the environment, being composed of so many more varied needs than the individual, is prone to unforeseeable and uncontrollable changes. The everyday does not last forever. Will and endeavour must always be insufficient. They can never control all the multiple energies of life. There is a satisfying irony in the almost simultaneous publication of Darwin's *Origin* and Samuel Smiles's *Self Help*.³⁴

Walter Cannon observes that Darwin had no developed vocabulary of self-help. Cannon presents this as a lack – but it is, rather, a measured exclusion.³⁵ Natural selection contradicts the Lamarckian idea that will and habit can generate improvement. Darwin's thinking was anti-Platonic, was anti-essentialist, 'a philosophy of flux' as Gerard Manley Hopkins observed, when he speaks of 'the ideas so rife now of a continuity without fixed points, not to say *saltus* or breaks.'³⁶ 'Million-fueled, nature's bonfire burns on.' In 'That Nature is a Heraclitean Fire' Hopkins images the profusion and decay, the endless energy of the natural world, and stays it with the image of Resurrection, man's leap. 'Natura non facit saltum' – 'Nature does not make leaps.' For Hopkins the way out of the 'world's wildfire' is the leap of faith. For Darwin, the

old conviction that nature does not make leaps opened into some of his most radical insights, leading him away from the idea of the chain of being or the ladder, with its hierarchical ordering of rungs, towards the ecological image of the ‘inextricable web of affinities’. These affinities he perceives sometimes as kinship networks, sometimes as tree, sometimes as coral, but never as a single ascent with man making his way upward. The emphasis upon interrelation and on difficulty, upon profusion and death, is visible in the diagram that Darwin presented in *The Origin of Species* compared with the neat triangulate geometry of Chambers’s diagram of ascent. There may be a punning cross-play in Darwin’s insistence on ‘entanglement’ in his theory and his metaphor. The primary meaning given to ‘evolve’ in the 1826 edition of Dr Johnson’s dictionary in Darwin’s library is ‘To unfold: to disentangle’. In his emphasis through the metaphor of the ‘entangled bank’ on ecological interdependence and ‘the inextricable web of affinities’ Darwin distinguishes an important fresh emphasis in his own work from other evolutionist theories.

In Lamarck’s theory conscious endeavour, as well as reflexive habit, are agents of evolutionary change. So he writes in *Zoological Philosophy* of ‘a bird of the waterside’:

Now this bird *tries to act in such a way* that its body should not be immersed in the liquid, and hence *makes its best efforts* to stretch and lengthen its legs. The *long-established habit acquired* by this bird and all its race of *continually stretching and lengthening* its legs, results in individuals of this race becoming raised as though on stilts, and *gradually obtaining* long, bare legs, *denuded* of feathers up to the thighs and often higher still. [my italics]³⁷

Lamarck proposes a world of intelligent desire rationally satisfied. His work also follows the pattern of all stories of how things came to be the way they are: need brings about change or – in more admonitory versions – bad behaviour results in loss and degradation. It is a pattern of story which has been predominant in many cultures. So the robin flew too close to the sun and acquired a red breast, or, ever after the reeds have whispered. He draws on mythic concepts of metamorphosis and transformation and explains them causally. The Just-So stories of Kipling elaborate the same pattern: how the whale got his throat, how the camel got his hump, how the leopard got his spots. *Intention* is the key to Lamarck’s concepts. And in this he accords with human wishes and human language. It is extraordinarily difficult to eradicate the language of intention from accounts of evolutionary development. Darwin himself never entirely succeeded. But for him there was a constant awareness

that he must try to expunge from language the suggestion that will is a force for change. It was Wallace who most directly answered Lamarck's self-help philosophy, in the *Proceedings of the Linnaean Society*, August 1858:

Neither did the giraffe acquire its long neck by desiring to reach the foliage of the more lofty shrubs, and constantly stretching its neck for that purpose; but because any varieties which occurred among its antetypes with a longer neck than usual at once secured a fresh range of pasture over the same ground as their shorter-necked companions, and on the first scarcity of food were thereby enabled to outlive them. (p. 61)

Genetic variations gave opportunities for further adaptation and fuller colonisation, but they could not be initiated or sustained by an act of will, of stamina, or of desire.

Lamarck's theory was in its way deeply satisfying: it gave primacy to mind – to intention, habit, memory, a reasoned inheritance from generation to generation in which need engendered solution and solutions could be genetically preserved by means of an act of will, rendered independent of consciousness as habit. Curiously and revealingly, Lamarck's account of evolutionary process is *still* the popular one. An intentionalist language keeps creeping into accounts of evolution. Lamarck's theory shifts the source of intention away from an interventionist deity who either created the World at one stroke or who at intervals intervenes to try out a new species. Instead the source of creativity is in the world of species. But intention or will remained the *instrument* of change, in that creatures learn physically to adapt and can in Lamarck's view pass on their acquired physical adaptations to their inheritors.

This reading of the past has no need of the concept of usurpation. It suggests an intelligible and co-operative world, in which succession is inevitably improvement. Whereas Keats in his proto-evolutionary poem *Hyperion* continued the emphasis of the Greek myth upon the need for revolution, upon the casting down of the old in order that 'The first in beauty shall be first in might', Lamarck's theory emphasises continuity and persisting development. In this way it was in accord with the parallel emphasis in geology upon the continuity of laws in nature. Many myths of origin emphasise the concept of degradation – the fall from Paradise, for example – but Lamarck's reading is more optimistic: it gives primacy to intelligent adaptation and intelligent succession. Lamarck tended to give predominance to the present; he did not envisage rapid change. Darwin suggested that the speed of change was probably increasing and might now more rapidly bring about the transformation of species. Darwin put this down partly to the greatly

increased complexity of interrelation between species, and between individual species and their natural environment. Lamarck placed less emphasis on competition and more on co-operation than could Darwin. He also gave less account of process and more of composition – that is, he imaged a world apparently more or less stable. As an ordering of the past in relation to present experience Lamarck's vision is attractive and neo-Lamarckian views continue to revive at intervals. Koestler's account of the case of the midwife toad is one of the most recent appraisals of the implications of Lamarckian metaphysics.

Lamarck's theory made room for one element of accretion to which Darwin paid little attention in *The Origin of Species* since he there suppressed the presence of man. This element is the accumulation of culture and inherited knowledge which man has been able to pass down (independent of genetic means) from generation to generation. But to some later writers even that power came to seem cursed. It was in Hardy's mind when he wrote, 'We have reached a degree of intelligence which Nature never contemplated in framing her laws, and for which she consequently has provided no adequate satisfactions.'³⁸ Or as Conrad's Heyst put it: 'Man on this earth is an unforeseen accident.'³⁹