DARWIN'S PLOTS

Gillian Beer's classic *Darwin's Plots*, one of the most influential works of literary criticism and cultural history of the last quarter century, is here reissued in an updated edition to coincide with the anniversary of Darwin's birth and of the publication of *The Origin of Species*. Its focus on how writers, including George Eliot, Charles Kingsley and Thomas Hardy, responded to Darwin's discoveries and to his innovations in scientific language continues to open up new approaches to Darwin's thought and to its effects in the culture of his contemporaries. This third edition includes an important new essay that investigates Darwin's concern with consciousness across all forms of organic life. It demonstrates how this fascination persisted throughout his career and affected his methods and discoveries. With an updated bibliography reflecting recent work in the field, this book will retain its place at the heart of Victorian studies.

DARWIN'S PLOTS

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

Third Edition

GILLIAN BEER

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Nature, if we believed all that is said of her, would be the most extraordinary being. She has horrors (horror vacui), she indulges in freaks (lusus naturae), she commits blunders (errores naturae, monstra). She is sometimes at war with herself, for, as Giraldus told us, 'Nature produced barnacles against Nature'; and of late years we have heard much of her power of selection.

Max Müller, *Lectures on the Science of Language*, second series, 1864, p. 566.

Contents

Foreword by George Levine *page* ix
Preface to the first edition xv
Preface to the second edition xvii
Preface to the third edition 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 *The Origin* 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: *Middlemarch* 139
I The vital influence 139
II Structure and hypothesis 148
III The web of affinities 156

6. George Eliot: *Daniel Deronda* 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

Notes 256
Select bibliography of primary works 282
Further reading related to Charles Darwin 288
Index 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.

Preface to the first edition

This work has filled and extended my life over several years. During that time I have been continuously grateful for the resources of the Cambridge University Library, the English Faculty Library, and the Girton College Library, and for the helpfulness of their librarians.

The English faculty office has come to my aid from time to time by typing draft sections and I would like to thank all the members of staff. Dr Jenny Fellows, and members of my family, have read proofs and checked references. Historians and philosophers of science as well as my colleagues in literary studies have been most kind in inviting me to try out my ideas in discussions, seminars, and lectures. I could not have completed the work without the stimulation of friends working in a variety of fields who have been generous of their knowledge, offering me references to pursue, arguments to consider, and scepticism to combat. It is hard to name a few among so many individuals to whom I feel gratitude, but I would particularly mention the importance of conversation over the years with John Beer, Jina Politi, Sally Shuttleworth, Allon White, and Ludmilla Jordanova. More recently, Howard Gruber, David Kohn, Mary Jacobus, and George Levine have offered invaluable help. Gordon Haight and Barbara Hardy have been of help to me since the beginning of my career and, like all those engaged with George Eliot, I am indebted to them for their work. Some very interesting writing on George Eliot and the relations between scientific and literary culture has not yet been published: I would particularly mention dissertations by John Durant, Simon During, Sally Shuttleworth and Margot Waddell.

Sections of the present book have appeared, in somewhat different form, in *This Particular Web* (ed. Ian Adam), *The Listener*, *Comparative Criticism* II (ed. Elinor Shaffer), *Women Writing and Writing about Women* (ed. Mary Jacobus), *Cahiers Victoriens et Edouardiens*, *The Journal for the History of the Behavioural Sciences*. In addition, I have written two forthcoming

essays which supplement the present work. 'Darwin's Reading and the Fictions of Development' in *The Darwinian Heritage* (ed. David Kohn, Princeton University Press) examines in much greater detail Darwin's literary reading at the period of theory formation and precipitation; 'Virginia Woolf and Prehistory' in *Virginia Woolf Centenary Essays* (ed. Eric Warner, Macmillan) shows the longer-term effects of Darwin's work in a twentieth-century writer.

Bearing and rearing children made me need to understand, first, evolutionary process, and then, the power of Darwin's writing in our culture. So it is to my mother and my sons that I dedicate this book – though without my husband, much would have been impossible.

Gillian Beer
Girton College, Cambridge

Preface to the second edition

Darwin has grown younger in recent years. He is no longer the authoritative old man with a beard substituting for God. Instead his work and life are again in contention and debate. Sociologists, microbiologists, linguists, sociobiologists, philosophers, feminists, psychologists, biographers, geneticists, novelists, poets, post-colonialists, have their say. Moreover, the publication, volume by tremendous volume since 1985, of the Darwin *Correspondence*[1] has shown us that, so far as Darwin's theories go, everything started with a young man, eager for knowledge and adventure, who set out on a journey round the world just before his twenty-third birthday: the age of a postgraduate student now. The letters bring out the vivid engagement of the young Darwin on his *Beagle* travels, the ardour of his response to the natural world and the immediacy of his engagement with societies he encountered. His vacillations in language register how hard he found it to settle his opinions of other tribes. His struggles with categories break open settled taxonomies. The stamina of his mental exploration gives the lie to the outworn assumption that once back from the *Beagle* he merely settled into a comfortable humdrum life. He was still on his world journeys while he sat in his armchair, his mind packed with the materiality of the physical world and sharpened by exceptions noted. His greenhousee could harbour questions that unsettled the assumptions of the western world – and he determined to engage with those questions.

When I came to write *Darwin's Plots* the best part of twenty years ago I first approached Charles Darwin's work through thinking about Victorian fantasy. Why was evolutionary theory abroad in so many guises? What anxieties did it arouse? What pleasures did it promise? And what new mental freedoms gave it its allure? As I began to investigate these

[1] Frederick Burkhardt; Sydney Smith; David Kohn; William Montgomery, eds. *The Correspondence of Charles Darwin, 1821–1882*, volume I (Cambridge, 1985); volume XI has now appeared and the edition is going forward strongly, with new editors added at present, through the 1860s.

questions I came to realise that the intellectual and emotional excitement generated by *The Origin of Species* was partly the outcome of Darwin's struggle to find a language to think in. He was working in a milieu where natural theology had set the terms for natural historians. The key concepts for natural theologians seeking to display God's workings in the material world were *design* and *creation*. Darwin, on the contrary, was trying to precipitate a theory based on *production* and *mutation*. How to think these ideas against the grain of the language available? One means was to invent a phrase poised on the edge of metaphor, a phrase that, moreover, alluded to its predecessor, even as it undermined it: 'natural selection' is a pithy rejoinder to 'natural theology'. Instead of an initiating godhead, Darwin suggests, diversification and selection have generated the history of the present world. Instead of teleology and forward plan, the future is an uncontrollable welter of possibilities. In the world he proposed there was no crucial explanatory function for God, nor indeed was there any special place assigned to the human in his argument. Those lacks, moreover, were not presented as lacks: the world of nature is always full.

I speak of 'natural selection' as poised on the edge of metaphor because of the way it claimed an explanatory role before contemporaries had learnt what it meant. They puzzled, as people have puzzled since, over its individual elements: natural as opposed to unnatural, or man-made? selected by whom or what? Part of Darwin's triumph is that the phrase, in the event, quite rapidly passed from this unruly question-raising, context-rich status into technical description. It came to seem honed, even simple.

Yet much of the power of 'natural selection' as a tool for thought comes from the opposing conceptual elements it encompasses. There is an awkward fit between the first two necessary elements and the third: the liberal emphasis on profusion, and variability, is constrained by the frugality of the selective process. There must be hyperproductivity; there must be difference; there must be death. Few organisms will survive through their progeny beyond a parsimonious number of generations. Yet, over aeons of time, all organisms are in some measure related to each other. Prodigality and rigour are the basis of his argument, as they are the characteristics of his prose.

Darwin affirmed at every stage of his argument and examples the linked concepts of diversification and selection. His metaphors of the tree and the great family in the *Origin* went some way to articulate his emphasis on unlikeness, transformation, and kinship – though they did

not have a complete explanatory fit. But he did not face the second outcome of his theories head on: the loss of future plan. He prophesies knowledge of the past but not of what is to come.

> When we better know the many means of migration, then, by the light which geology now throws, and will continue to throw, on former changes of climate and of the level of the land, we shall surely be enabled to trace in an admirable manner the former migrations of the inhabitants of the whole world.

When, *then*, *surely*: understanding will allow us to track *former* changes and migrations. Nowhere does Darwin give a glimpse of future forms: and rightly so, since it is fundamental to his argument that they are unforeseeable, produced out of too many variables to be plotted in advance.

He countered the reader's eschatological appetite by fastening our attention on a backward story told laterally. His narrative demonstrated in every field of understanding the processes by which the variety of the present world had been arrived at. It was a form of history and had to be so since the full array of experimental evidence no longer survived – and could not do so if the theory of natural selection, with its emphasis on extinction and the vanishing of earlier forms, was sound. So although Darwin himself gave some considerable emphasis to the language of progress and improvement, generating an onward and upward motion in much of his storytelling, these tales were constantly under the pressure of other, darker stories – of rapine, degradation, and loss.

> 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. . . . We behold the face of nature bright with gladness, we often see superabundance of food; we do not see, or we forget that the birds which are idly singing round us mostly live on insects or seeds, and are thus constantly destroying life.[2]

Gladness and destruction: life, making and destroying itself; the individual, swamped and yet demanded as a medium for mutation; the human, everywhere and nowhere in his argument: these tensions were what so intensely interested me in the *Origin*. The energies of these conflicting narratives poured into Victorian responses. They set peculiar tasks for novelists where the writer's prospecting eye is expected to take responsibility for the futures inscribed. Those futures, or fictional 'events',

[2] Charles Darwin, *The Origin of Species*, ed. Gillian Beer (Oxford, 1996) pp. 393, 52–3. This edition is referred to in this preface only; in the main text page-references are to ed. John Burrow (Harmondsworth, 1968).

take place, moreover, within the multiple hypothesised futures the reader is encouraged to produce in the process of reading the story. *Middlemarch* works with these multiplicities. Darwin's narratives set another challenge, too, because the scope of the individual's lifespan is both very slight in evolutionary terms: once progeny are produced the individual is done with, biologically; yet, the individual also carries the freight of evolutionary change through the slight variations encoded in each organism or person. Hardy, in particular, responded to this double chanciness.

Samuel Butler, who deserves and has received attention elsewhere but not in this book,[3] saw the problem implied: in human affairs, biological evolution takes place across another evolutionary form, that of cultural memory. Through record and language, through tools and machines, futures are built and change is released – though at the same time the process is understood as settling society and grounding knowledge. No human lifespan is long enough to invent the fundamental tools and conditions for living which we take for granted (wheels, telephones, democracy, one-party rule) and which are donated by the historical culture within which the human person is born already embedded. That idea is now enjoying renewed currency through the idea of 'memes',[4] a term that draws language into evolutionary theory and insists on what Stephen Pinker calls 'the rococo complexity of human grammar' as an outcome of the selective process.[5]

> I suspect that evolving humans lived in a world in which language was woven into the intrigues of politics, economics, technology, family, sex, and friendship that played key roles in individual reproductive success. They could no more live with a Me-Tarzan-you-Jane level of grammar than we could.

Such argument also emphasises primordial continuities in our most sophisticated products. George Dyson puts that second point in an approachable form in *Darwin Among the Machines*:[6]

> Evolution is traditionally portrayed as a succession of discrete layers, those of geology and biology gathered into chapters like the pages of a book. A layer of dinosaurs is followed by a layer of mammals. But the precursors of mammals were there all along. If you could ask mammals how long they had been around, they wouldn't answer, 'Since the dinosaurs left,' they would answer,

[3] George Dyson, *Darwin among the Machines* (London, 1997); Elinor Shaffer, *Erewhons of the Eye: Samuel Butler as Painter, Photographer and Art Critic* (London, 1988).
[4] See especially Daniel C. Dennett, *Darwin's Dangerous Idea: Evolution and the Meanings of Life* (New York, 1995), pp. 335–369.
[5] Stephen Pinker, *The Language Instinct* (London, 1995) p. 368.
[6] Dyson, *Darwin among the Machines*, p. 202.

'Since life began.' If you could ask the same question of machines such as microprocessors, you might get an answer that begins not with the age of computers but with the age of bifacial stones.

Even now, the articulation of Darwinian theory is fraught with multiple meanings that Darwin himself sought to control – or which he never fully and consciously confronted. We see it in the continuing debates around sociobiology and genetics; in the arguments that arose in the mid-1970s between the mechanistic and yet anthropomorphic concept of the 'selfish gene' of Dawkins and the environmental emphasis of Lewontin's genetics: 'context and interaction are of the essence'.[7] The severely directive arguments concerning human achievement that were fashionable in the sociobiology of that time, particularly in the debate that raged around E. O. Wilson's *Sociobiology: the New Synthesis*,[8] have gradually given way to a renewed fascination with variability, as we see in Wilson's own later work.[9]

The works of David Worster and Richard Grove, for example, have made manifest the link between ideological practices and ecological management.[10] Indeed, it is remarkable that the chapter on 'Natural Selection' that among Darwin's contemporaries was often read as an argument for competition 'in the great and complex battle of life' now reads so strongly also as an ecological text:

> Let it be borne in mind how infinitely complex and close-fitting are the mutual relations of all organic beings to each other and to their physical conditions of life.[11]

Darwin can be seen either as providing a grounding vocabulary for colonialism, or, as I have elsewhere argued, equally as resisting 'intrusion' and idealising the closed environment of island spaces because they give opportunities for the most 'natural' form of natural selection in which the indigenous inhabitants uncover among themselves more and more ecological niches through the action of variation.[12]

[7] Richard Dawkins, *The Selfish Gene* (Oxford, 1976), passim; Richard Lewontin, *The Genetic Basis of Evolutionary Change* (New York, 1974) p. 318.
[8] (Cambridge, Mass., 1975); *On Human Nature* (Cambridge, Mass., 1978); *The Diversity of Life* (Cambridge, Mass., 1992).
[9] *Naturalist* (Washington, DC, 1994); *Consilience: the Unity of Knowledge* (London, 1998).
[10] David Worster, *Nature's Economy: a History of Western Ecological Ideas* (Cambridge, 1985); Richard Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1800* (Cambridge, 1995).
[11] Charles Darwin, *The Origin of Species* ed. Gillian Beer (Oxford, 1996) p. 67. For discussion see Introduction pp. xxvi–xxviii.
[12] 'Writing Darwin's Islands: England and the Insular Condition', in Timothy Lenoir (ed.), *Inscribing Science: Scientific Texts and the Materiality of Communication* (Stanford, 1998), pp. 118–139.

One of the most spirited and sophisticated recent interventions into the issue of competition and variability, determinism and the random, has been Daniel Dennett's *Darwin's Dangerous Idea.*[13] Dennett avoids personification as well as the problem of the individual by placing the 'dangerous idea' at a level that refuses such concerns: the algorithmic. Dennett characterises algorithms as having 'substrate neutrality', 'underlying mindlessness', and 'guaranteed results'. He then presents his fundamental assertion:

> Here, then, is Darwin's dangerous idea: the algorithmic level *is* the level that best accounts for the speed of the antelope, the wing of the eagle, the shape of the orchid, the diversity of species, and all other occasions of wonder in the world of nature. It is hard to believe that something as mindless and mechanical as an algorithm could produce such wonderful things. No matter how impressive the products of an algorithm, the underlying process consists of nothing but a set of individually mindless steps succeeding each other without the help of any intelligent supervision; they are 'automatic' by definition: the workings of an automaton.[14]

Darwin mitigated the ruthlessness of that definition by emphasising the immense time-scapes in which such changes have occurred and by linking them to a process whose very unconsciousness implied a benignity not shown in the conscious machinations of human 'artificial selection'. Artificial selection is a selfish process; natural selection a selfless one: 'Man selects only for his own good; Nature only for that of the being which she tends.'[15] Darwin's imaging of selflessness is ethical: the sustaining action of mother or nurse; Dennett's is of impervious process, selfless because without self, automatic only. What binds them convincingly together is unconsciousness: not Freud's 'unconscious' but a process recuperable only through immense numbers or through vast tracts of time. Strikingly, Dennett brings back in at least the terminology of design and creation when he remarks on the capacity of creatures to form other creatures by the ways in which their predatory demands articulate the contrary form of those that elude them. In that sense, cats may be said to make mice.[16] Like Dawkins, Dennett refuses either a species or an individual perspective on survival, preferring to work at the level of the gene, bent on replicating itself. This insistence on single-purpose survival at the level of the gene certainly clears away

[13] See note 4 above.
[14] *Ibid.*, pp. 50–51, 59.
[15] *Origin*, p. 69.
[16] See e.g. Dennett, *Darwin's Dangerous Idea*, p. 511.

some sentiment, but it does not do away with the need to interact or collaborate for the purposes of survival.

Exactly as it did in the nineteenth century, Darwinism has generated profoundly opposed insights and narratives now: on the one side, the deterministic sequences of sociobiology with its emphasis, at the human level, on the constrained choices of any individual whose DNA has already mapped its own trajectory. Whose story is this anyway? Dawkins's metaphor of the selfish gene, like the story of eggs countenancing chickens simply as the medium of egg-production, has a gruelling, mischievous comfort in it.[17] Not much can be changed; the social order is always already implemented by the interactions of genes in the gene-pool, expressed over time as intelligence, gender, even class. That is one extreme story Darwinism offers now. Another story is of the random non-purposive profusion of possibilities genetically encoded, scarcely a one of them to be played out.

A compelling reason for the presence of Darwin in argument and in popular imagination at present has been the accumulating realisation over the past decade of how significant the discovery of DNA is for all our lives and futures. Darwin achieved his advances without knowledge of genetics but DNA has raised anew in a more immediate form many of the controversies crucial in the first wave of reception of *The Origin of Species*, particularly the troubled realisation that humans and animals share common ancestry, and, it is now known, common genetic material. Ruskin's shudder of distaste at the 'filthy heraldries' that link man and crocodile thrills still through the discussions of trans-genic organs.[18] And the biological determinism that some saw in Darwin's taxonomy has become central to the arguments about mapping the human genome. Cloning, a powerful technique with immense future consequences, is at present the contrary of evolution. It replicates; it refuses deviance; it is the strongest form of artificial selection yet invented since it allows humankind to select whole organisms for absolute replication. But already difference is emerging. The cloned creature is born into a new generation. Its conditions vary from those of the mother. On the other hand, it may be born further through its life-cycle since it shares with its mother the stage of life at which cloning took place. As Borges foresaw, to write *Don Quixote* now produces a different text even if it is word for

[17] *The Selfish Gene* (London, 1978); *The Blind Watchmaker* (London, 1986).
[18] See discussion on pp. 7–8 and ch. 4, passim.

word identical with the original. And that applies to Dolly the Sheep and her like too.

The title of this book, *Darwin's Plots*, is a double genitive: it indicates both the plots that Darwin grew up with and the plots he generated for others. When I was at work on the project I was always conscious of the degree to which Darwin drew on familiar narrative tropes (such as leaving the garden, or discovering your ancestry was not what you believed). That seemed crucial to understanding how it was possible for him to produce so many stories within his theory that could be teased out, or redesigned, by imaginative writers: the descent of man, the ascent of man, transformation, extinction, the great family, the tree of life, marriage as artificial selection or sexual selection.

I have chosen in this second edition not to alter what I wrote in the body of the 1983 text. This is not because I am fully content with the scope of the analysis I offer there but rather because so much has intervened that were I to begin again I would want to add a good deal more on Darwin's writing outside the *Origin* and to develop at large the insights offered by more recent race and gender analysis. In *Open Fields: Science in Cultural Encounter* (Oxford, 1996) I have engaged with some of these issues, in particular, I have worked with the writing on and after the *Beagle* and explored Darwin's encounters with indigenous peoples. I now view these as being of equal importance for the precipitation of his theories as his encounter with the tortoises and finches of the Galapagos. My discussion in *Darwin's Plots* of *The Descent of Man* is slight and there is now great need for thorough engagement with that book. It is likely that the *Descent*, even more than the *Origin*, was the seedbed for later Victorian writers, such as George Gissing, Grant Allen, H. G. Wells, and for New Woman novelists, like Sarah Grand, Mona Caird, and George Egerton. The *Descent* is also a much less tractable, or attractive, book for the modern reader. It is by far the most culturally dependent of Darwin's works, drawing for its evidence and affirmations on the works of ethnographers, race-theorists, and primatologists of the 1860s, themselves often affected by Darwin. The circle of evidence is therefore sometimes disturbingly untroubled since materials are passed round and back from one field to another, as I suggested in 'Darwin and the Growth of Language Theory' was the case with philology and Darwinian evolution.[19] In *Darwinism and the Linguistic Image: Language, Race, and Natural Theology in the Nineteenth Century* Stephen Alter argues this case at large. He writes:

[19] *Open Fields: Science in Cultural Encounter* (Oxford, 1996, paperback, 1999), ch. 4.

Every age, perhaps, has its special predilections with regard to this kind of cross-disciplinary affinity, its couplings of different phenomena that mutually resonate nonetheless. These seemingly natural metaphors – half-conscious bonds of logic among distinct fields of knowledge – draw upon the aesthetic sensibility of a given time and place.[20]

At the time that I was composing this work the study of science in relation to literature had been developed by only a few earlier pioneers though it is now a highly productive seam at the critical coalface and producing some outstanding work.[21] The aesthetic sensibility of this present time has freed scientific writing from its privileged (and therefore peripheral) autonomy and has emphasised the degree to which scientists work with (and against) the shared metaphors and preferences of the broader community within which they live, work, play and think. This book does not imply that Darwin's work is 'fiction', as some puzzled readers at first assumed. It argues that how Darwin said things was a crucial part of his struggle to think things, not a layer that can be skimmed off without loss. It shows how his non-technical language (which may indeed have imagined a technical readership) allowed a wide public to read his work and appropriate his terms to a variety of meanings (Nature, race, man, struggle, fit, and family would be examples of story-generating words). My argument demonstrates the degree to which narrative and argument share methods; indeed, it enquires what differences can be maintained between narrative and argument.

Were I to begin, wholesale, again I might not now hold to the form I frequently used then of deliberately adopting the Victorian form 'man' as a gender-inclusive term when discussing mid-nineteenth-century controversies. It seemed to me cumbersome (and perhaps misleading) to correct 'man's place in nature' to 'humankind's place', without being able to correct the many assumptions of the mid-nineteenth century with which Huxley's title is loaded. Above all, I did not wish to assume (nor would I still) the condescension of history towards Victorian terms. That condescension has a dangerous capacity to let the present off the hook and to suggest that we are now free of prejudices we can so readily symptomise when we recognise them set back one hundred or so years. I have written more extensively elsewhere about such questions,

[20] Stephen G. Alter, *Darwinism and the Linguistic Image* (Baltimore and London, 1999), p. 1.

[21] One of the first and best of the wave is Sally Shuttleworth, *George Eliot and Nineteenth Century Science: The Make Believe of a Beginning* (Cambridge, 1984). See George Levine (ed.), *One Culture: Essays in Science and Literature* (Madison, 1987), *Realism and Representation: Essays on the Problem of Realism in Relation to Science, Literature, and Culture* (Madison, 1993); Elinor Shaffer (ed.), *The Third Culture: Literature and Science* (Berlin, 1998).

particularly in 'Speaking for the Others: Relativism and Authority in Victorian Anthropological Writing'.[22]

Since *Darwin's Plots* appeared feminist writers such as Evelyn Fox Keller[23] have explored some of the ways in which the epistemic contours of scientific activity and writing can be shifted when attributes associated with the feminine are allowed their place. Her work, together with that of Donna Haraway on the history of primatology in the twentieth century, has raised issues that would have been helpful to me at the time. In particular, Haraway's analysis would have allowed me to extend the work on race that I moot here in a rather preliminary form. It is striking that Homi Bhabha's immensely usable idea of 'hybridity' follows on, at a distance, from Darwin's rather anguished discussion of 'Hybridism'.[24] Darwin is troubled principally by the question as to whether hybridism inevitably produces sterility, which suggests that species are fixed natural categories, rather than the moveable varieties he sought. In Bhabha's work hybridity and mimicry allow interchange and shifting power relations between groups where the power hierarchies have previously appeared to be (and have been represented as being) inexorably fixed.

In Darwin I encountered a man thinking within the frame of his society, certainly, but with all the sensory resources of the human, and with an enthusiasm and empathy for other living forms that took him far from any stereotype of the Victorian patriarch. His life may have fallen into conventional patterns but his mind continued to assay materials that ran counter to his society. My understanding of Darwin is of a figure less assured, more deflected by insight, than that presented in so robust a fashion in the major biography *Darwin*, by James Moore and Adrian Desmond.[25] Had Darwin been so at ease with the cultural conditions of his class and nation he could not, I think, have reached the radical insights offered in his theory. I have written at large about these issues in 'Four Bodies on the *Beagle*'.[26] The difference of perception

[22] In *Open Fields*.

[23] Evelyn Fox Keller, *Reflections on Gender and Science* (New Haven and London, 1985); Donna Haraway, *Primate Visions: Gender, Race and Nature in the World of Modern Science* (London, 1989). See also Londa Schiebinger, *Nature's Body: Gender in the Making of Modern Science* (Boston, 1993); Marina Benjamin (ed.), *Science and Sensibility: Gender and Scientific Enquiry 1780–1945* (London, 1991).

[24] Homi Bhabha, *The Location of Culture* (London, 1994); *Nation and Narration* (ed.) (London, 1990).

[25] Adrian Desmond and James Moore, *Darwin* (London, 1991). See also Janet Browne, *Charles Darwin:* Volume I, *Voyaging* (London, 1995) for a nuanced account, yet to be completed by a second volume.

[26] *Open Fields*, pp. 13–30.

between my own analyses and those of his biographers is, I think, because I work with the writing, in which hesitation, reach, inhibition, and empathy declare themselves in the syntax as well as the semantics of sentences – and where stories abound and grate upon each other.

> The struggle for existence inevitably follows from the high geometrical ratio of increase which is common to all organic beings. This high rate of increase is proved by calculation, – by the rapid increase of many animals and plants during a succession of peculiar seasons, or when naturalised in a new country. More individuals are born than can possibly survive. A grain in the balance will determine which individual shall live and which shall die, – which variety or species shall increase in number, and which shall decrease, or finally become extinct.[27]

The secure 'inevitability' of the first sentence, whose grammatical structure reinforces its argument, begins to jump in the second with its move from proof to general examples. Then the odd 'More individuals are born than can possibly survive' demands that the reader understand 'survive' here as continuance through progeny. Individuals all die. And suddenly the frailty of the process comes home 'a grain in the balance' – and the large leap is made from the individual to variety or species. That leap is permitted by the comma and dash in the middle of the sentence. The swerve is followed by a series of clauses that seems to promise expansion 'which variety or species shall increase in number', but which then closes down upon itself to end the sentence with 'become extinct'. Writing gives phenomenological entry into the uncertainties on which creative thinking draws.

It is the constant movement between reach and correction that produces contradiction in the stories Darwin's writing generates. In the second half of this book I explore ways in which some nineteenth-century novelists who read his work responded to, and resisted, Darwinian insights. George Levine has tackled this question in a different way, placing his emphasis on those writers who did *not* read Darwin (at least in any systematic way we can discover) but who, all the more, could draw freely on the ideas his work had generated and who provided fictional materials for Darwin to work with. Levine's analysis in *Darwin and the Novelists: Patterns of Science in Victorian Fiction* (Cambridge, Mass., and London, 1988) importantly supplements what I offer as well

[27] *Origin*, p. 378.

as engaging with other authors, but there is no inconsonance between the two projects.

Perhaps the most striking phenomenon of recent years has been the assurance with which creative writers have turned to scientific materials for their imaginative work. A. S. Byatt, Peter Carey, Michael Frayn, Tom Stoppard, are just the start of the roll-call. Science always raises more issues than can be answered solely within the terms of scientific enquiry. It suggests, as Darwin so strongly did, questions about chance, about the future, about the very large and the very small, the near and far. Quantum mechanics, as much as Darwinian evolution, has yielded new forms for fiction, as in Jeannette Winterson's *Sexing the Cherry* (1989) and *Gut Symmetries* (1997), which undoes the fixed bounds of living and being dead; and for poetry, as in Jorie Graham's *The Dream of the Unified Field* (1996) which includes poems also from her earlier collection 'Hybrids of Plants and of Ghosts'. What new tales are being unleashed from scientific work now? and what new forms for storytelling? Must there be new grammars for narrative or is Propp's view of fixed folk-tale grammars, based on the analogy with morphology, still viable? Are there stories to be told from places and organisms until now unrecognised? Can first person be induced from ticks, dramatic monologues from mad cows? The answer to that last question is certainly yes, as the poems of Jo Shapcott and Les Murray make clear.[28]

Les Murray, in his poem 'Cell DNA' from the sequence 'Translations of the Natural World' pinpoints the necessary disruption of gene-life, too, as part of evolutionary processes:

> I am the singular
> in free fall.
> I and my doubles
> carry it all:
>
> life's slim volume
> spirally bound.
> It's what I'm about,
> it's what I'm around.
>
> Presence and hungers
> imbue a sap mote
> with the world as they spin it.
> I teach it by rote

[28] Jo Shapcott, the mad cow sequence in *Phrase Book* (London, 1992).

but its every command
was once a miscue
that something rose to,
Presence and freedom

re-wording, re-beading
strains on a strand
making I and I more different
than we could stand.[29]

Difference is painful as well as creative ('strains on a strand/making I and I more different/than we could stand); rote action and miscuing are necessary to evolutionary reach. Algorithm and meme alike are caught in Murray's description, voiced from cell DNA.

That feeling for lost, impossible, or discounted voices finds expression also in subaltern stories such as Roger McDonald's novel *Mr. Darwin's Shooter* (1998) which awakens us to the presence of Covington, Darwin's servant. Covington accompanied Darwin on all the revelatory land-journeys from the *Beagle*, collected and tabulated specimens and continued to send Darwin samples until Covington's death – and is nowhere mentioned by name in the *Origin*.

Half of Covington was in its pages – those years when his life was disgorged at Darwin's feet – the bundles of bones and birdskins to be interpreted – the glass jars devotedly sealed – the million gouged eyes – the innumerable notes copied in his own true hand.[30]

McDonald endows Covington with religious belief that runs ecstatically counter to the implications of the theory he has helped to ground. The novel brings home that Darwin was never a singleton. He needed and used the work, information, and insights of many people to do his work and be himself. Jenny Diski, in her novel *Monkey's Uncle* (London, 1994), brilliantly shows Fitzroy at work emotionally and intellectually in Darwin, as well as genetically in his possible descendant Charlotte, the heroine of this story. In a moving long poem 'Darwin in 1881' the American poet Gjertrud Schnackenberg captures the sense of Darwin as Prospero, understanding the chancy games in which sex and universe may be oscillating terms and so many possibilities remain unplayed:

He'd quite by chance beheld the universe:
A disregarded game of chess
Between two love-dazed heirs

[29] Les Murray, *Translations from the Natural World* (London, 1993) p. 41.
[30] Roger McDonald, *Mr. Darwin's Shooter* (London, 1998) p. 367.

> Who fiddle with the tiny pairs
> Of statues in their hands, while numberless
> Abstract unseen
> Combining on the silent board remain
> Unplayed forever when they leave the game
> To turn, themselves, into a king and queen.[31]

At the end of her poem she imagines Darwin wandering the garden on his last night alive and coming at last to bed:

> He lies down on the quilt,
> He lies down like a fabulous-headed
> Fossil in a vanished river-bed,
> In ocean drifts, in canyon floors; in silt,
> In lime, in deepening blue ice,
> In cliffs obscured as clouds gather and float;
> He lies down in his boots and overcoat,
> And shuts his eyes.

In those last lines sleep, space, and species, ice and eyes, soften into death.

Darwin himself saw that taxonomies always cause trouble with boundaries, that they draw on prior assumptions, that their values tend to form an evidential circle about what matters for categorisation.[32] Darwin never doubts the world is real. But he does doubt our categories for understanding it and indeed questions, while he shares, the categorising zeal of human beings. That unsteadying of plot allows him to continue to generate new debate and insight in an extraordinary variety of fields.

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[31] Gjertrud Schnackenberg, *The Lamplit Answer* (London, 1986), p. 44.
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