

## PROLOGUE

*The Darwinian legacy*

‘THE SINGLE BEST IDEA ...’

## I

When Karl Marx wrote to Ferdinand Lassalle in January 1861 that *On the Origin of Species* had furnished him with a natural-scientific grounding for the class struggle in history, he could hardly have guessed the extent to which, by the end of the following century, Darwin's theory of natural selection would have been triumphantly vindicated but his own theory of class struggle falsified by subsequent events. It was not as if Darwin succeeded in his lifetime in meeting the objections to the theory of natural selection which his critics levelled against it. Nor could he, since he had no possible way of knowing how biological inheritance actually works. The irony on which many of his biographers and commentators have remarked is that he could have read Mendel's subsequently world-famous paper about cross-pollinated garden peas. But, even if he had, it would not have given him all the answers he needed. Decades later, self-styled Mendelians could still be anti-Darwinians. It was only when the 'new synthesis', as it came to be called, brought together evolutionary theory and population genetics that it became possible to resolve the seeming conundrum that if biological inheritance was blended selection couldn't operate at all (which in fact it can), while if it was particulate it couldn't operate in the way that Darwin supposed (which in fact it does). Still less could Darwin have anticipated the discoveries of molecular biology which made it possible to integrate evolutionary theory with an understanding of how information affecting phenotype through the construction of proteins is transmitted from one organism to another by being encoded in strings of DNA, or the developments in statistics, game theory, and computer science which practising behavioural scientists now take for granted.

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It might therefore seem that to comparative sociologists of the twenty-first century seeking to explain the evolution of distinctive patterns of collective human behaviour, Darwin's own writings can be of no more than antiquarian interest. But nobody who has read *The Descent of Man* as well as *On the Origin of Species* can continue to think so. Darwin's prescience is all the more remarkable in the light of what he didn't and couldn't know not only about population genetics and molecular biology but also about primate ethology, palaeoanthropology, archaeology, linguistics, demography, and developmental and cognitive psychology. Sexual selection, which, except for its treatment by R. A. Fisher in one early paper and then his classic *The Genetical Theory of Natural Selection* of 1930, was almost completely ignored for a century after Darwin's death, was to become one of the fastest-growing areas of evolutionary biology (Miller 1998) and to bear directly on issues central to feminist theory (Campbell 1999); Darwin's observations of animals' capacity for deception and manipulation were to be fully borne out in studies of the 'Machiavellian' intelligence which we share with other species (Byrne and Whiten 1988; Whiten and Byrne 1997); his view of linguistic ability as 'an instinctive tendency to acquire an art' directly anticipates the late twentieth-century alliance of traditional linguistics with developmental psychology and neuroscience (Pinker 1994: 20); his discussion of the derivation, as he put it, of the 'so-called moral sense' from the 'social instincts' anticipates the whole modern literature on altruism and the evolution of cooperation between unrelated conspecifics in both animal and human populations; and he was as aware as any present-day theorist of cultural group selection of the possibility that selective pressure can operate not only on competing individuals but also on competing groups.

It has often been remarked that the idea of variation was no more original to Darwin than the idea of selection. But it was by combining them as he did that he took the teleology out of evolutionary theory altogether. It is because what he called 'descent with modification' – hereafter 'heritable variation and competitive selection' – resolves the age-old problem of qualitative change without recourse to either special creation or a pre-determined goal that the philosopher Daniel Dennett can call Darwin's 'the single best idea anyone has ever had' (Dennett 1995: 21). The psychologist Donald T. Campbell, who was perhaps the first behavioural scientist to appreciate the implications of natural selection being only one among other special cases of a more general evolutionary theory, aptly credited the Darwinian paradigm with providing what Campbell called 'the universal nonteleological explanation of teleological achievements' (1974: 420). Not

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only does natural selection explain more about human behaviour than the overwhelming majority of twentieth-century sociologists were willing to concede, but the heritable variation and competitive selection of information which affects behaviour in the phenotype is a process which operates also at both the cultural level, where the information is encoded in *memes* – that is, items or packages of information transmitted from mind to mind by imitation or learning – and the social level, where it is encoded in rule-governed *practices* which define mutually interacting institutional roles. The definition of ‘institution’ in the literature of sociology has been almost as troublesome as that of ‘culture’ and ‘society’ themselves, and some sociologists talk about ‘social practices’ when they have informal, interpersonally acquired behaviour-patterns as well as, or instead of, formal, institutionally imposed ones in mind. But a categorical distinction has to be drawn between behaviour regulated by formal inducements or sanctions attaching to extra-familial economic, ideological, or political roles designated as such and behaviour regulated by informal habits and conventions. The mechanisms of heritable variation and competitive selection are quite different in biological, cultural, and social evolution. No less important than the recognition that natural selection cannot by itself account for the diversity of collective human behaviour-patterns is the recognition that cultural and social selection, which have too often been assimilated (including by Campbell) under the rubric of ‘sociocultural evolution’, are, as subsequent chapters will abundantly demonstrate, not at all the same thing.<sup>1</sup> There are not two but three levels at which evolution drives human populations down the open-ended, path-dependent trajectories which continue to generate new patterns of collective behaviour out of old.

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The purpose of this book is not so much to defend selectionist theory against its critics as to suggest how the agenda of comparative sociology should be reconstructed in its terms. Yet anti-Darwinism is, to this day, as much a part of the Darwinian legacy as neo-Darwinism is. It may no longer be fuelled by the righteous indignation of pious Victorians

<sup>1</sup> As pointed out by Brown (1991: 40), anthropologists have been particularly prone not only to contrast ‘cultural’ and ‘social’ jointly with ‘biological’ but to treat ‘a culture’ and ‘a society’ as synonymous. This is understandable where, as in much of the ethnographic record, cultural and social boundaries coincide. But sociologists will seldom if ever find an exact fit if they map the distribution of shared memes onto the distribution of interacting practices across a designated institutional catchment area.

determined to remain on the side of the angels when confronted with the distasteful suggestion that we are all descended from apes. But there are still many people, sociologists included, for whom ‘neo-Darwinism’ implies either the social-Darwinian racism of the late-nineteenth century or the reductionist sociobiology of the late-twentieth. They may agree that the theory of natural selection is no more likely to be discarded in favour of Archdeacon Paley’s theology than present-day physical theory to be discarded in favour of Aristotle’s. But they are as resistant as any pious Victorian to the application of Darwin’s fundamental insight to the behaviour of creatures with minds like ours. They may no longer believe that we are distinguished from our primate ancestors by our possession of immortal souls. But they are not persuaded that the conduct of self-conscious human beings who actively choose between alternative courses of purposive action can be explained within a paradigm which was inspired by, and should be restricted to, the behaviour of creatures guided only by perception and instinct.

To this, there are two related answers. The first is that, as Darwin well knew, purposive decision-making is not unique to humans. The second is that there is nothing about purposive decision-making which removes it, and the behaviour resulting from it, from the possibility of selectionist explanation. Darwin himself was, in his own words, ‘very far from wishing to deny that instinctive actions may lose their fixed and untaught character, and be replaced by others performed with the aid of the free will’ (1882: 66). Nowhere in this book will it be implied, let alone asserted, that there is no such thing as choice between alternative possible courses of action. It is a truism of sociology that social relationships are created, interpreted, and negotiated by the interacting individuals whose relationships they are. But purposive decision-making, whether by human beings or the members of any other large-brained species, is a natural, not a supernatural, phenomenon. We need to explain without recourse to what Dennett calls ‘skyhooks’ how the behaviour of organisms with minds and therewith purposes affects the course of cultural and social evolution. Behind all individual decisions there are detectable genetic, cultural, and social influences which have guided them, and there are detectable mechanisms through which they have played their part in the evolution of the collective behaviour-patterns which distinguish one kind of culture or society from another.

The implication for sociology of Darwin’s fundamental insight is not that heritable variation in culturally or socially transmitted information affecting phenotype is random in the same sense that genetic drift is

random. It is that the causes of variation in information affecting behaviour in the phenotype cannot by themselves provide the explanation of what turn out to be its consequences. To cite a familiar topic to which I shall return in Chapter 3, the causes of variation among different human populations in their shared attitudes to, and beliefs about, what Darwin called ‘unseen spiritual agencies’ are at the same time readily ascertainable and extremely diverse: the exemplary preacher, the hallucinated visionary, the charismatic prophet, the vengeful moralist, the shamanistic interpreter of dreams, the world-abjuring hermit, the messianic cult-leader, and the author or reinterpreter of holy writ may be acting under any number of different influences, giving expression to any number of idiosyncracies of character, and seeking to realize any number of practical as well as spiritual aims. But the success or failure of their teachings depends not on how their own mental states have come to be what they are but on the features of their environment which do or don’t favour the reproduction and diffusion of the memes which they transmit to their disciples by imitation or learning and then, if things go well, propagate through institutional roles like those of priest and schoolteacher in which successive incumbents replace one another independently of purely personal relationships.

That is very different from claiming that innovators’ aims have no part whatever to play in the explanation of the ongoing course of cultural and social evolution. Innovators often act with deliberation and design with foresight. Suppose, to remain with the same example, that a cynical evangelist has conducted careful market research before formulating a doctrine then spread by well-incentivized acolytes among a gullible population of prospective converts. This may not be the way that visionaries, preachers, and prophets usually proceed. But in such fields of human endeavour as engineering or medicine or architecture – to say nothing of advertising – innovations are launched, tested, and modified (or discarded) as part of a deliberate strategy of competitive selection directed to finding and then exploiting the fittest mutations. In that sense, creative innovation is the antithesis of random variation, even where randomization is itself, as it sometimes is, a deliberate strategy. But Campbell, who in an early paper argued for what he called ‘blind variation and selective retention’ (Campbell 1960), meant by ‘blind’ not that engineers, doctors, or architects don’t know what they’re doing, or that there is no distinction to be drawn between the winnowing of alternative designs by personal choice and their winnowing by external agency, but that would-be innovators cannot anticipate the consequences of their own or other people’s

discoveries until they have made them. On this point, neo-Darwinians can wholeheartedly agree with a twentieth-century philosopher resolutely hostile to the very idea of social science who quoted with approval the remark of Humphrey Lyttelton that if he knew where jazz was going he'd be playing it already (Winch 1958: 94). The human capacity for active pursuit of innovation doesn't remove the mutations and combinations of information affecting phenotype which result from it into a creationist world beyond the reach of selectionist theory. That, in turn, does not mean that comparative sociologists can answer the questions which concern them by directly applying the models which have served the theory of natural selection so well to the very different, although in some ways analogous, mechanisms by which cultural and social evolution are driven. But it does mean that they can profitably put the idea of heritable variation and competitive selection to use in the service of the 'just what is going on here?' approach which the economist Robert M. Solow sees as distinguishing biological from physical science (1997: 56–7) and recommends to human behavioural scientists in consequence.

There is, however, another view of the Darwinian legacy which is perhaps more insidious because it is held with equal conviction by anti-Darwinians on the one side and ultra-Darwinians on the other. It is that to the extent that Darwinian theory can be applied to the evolution of human cultures and societies, it can only be as the theory of natural selection itself. To both anti- and ultra-Darwinians, a Darwinian sociology is either applied biology or it is not Darwinian. To bring the paradigmatic conception of heritable variation and competitive selection and its associated terminology to bear on human cultural and social behaviour as such is, on both their views, a merely metaphorical exercise.

The answer is again twofold. In the first place, much of the vocabulary of science is metaphorical and none the worse for that: ought we to stop talking of electricity as a 'current' because it isn't in fact a liquid? In the second, the objection has force only where demonstrably metaphorical terms are used to disguise the weaknesses of propositions which, when construed literally, can be shown not to be as well validated as the metaphor implies that they are. Thus, to say that cultures evolve through the heritable variation and competitive selection of information affecting phenotype which has been transmitted from mind to mind by imitation or learning would be illegitimately metaphorical either if there were no such information affecting

phenotype or if the information transmitted was always reproduced in the receiving mind without any possibility of mutation. But the information is not a metaphor. It is the reality. There is no other thing for which it is standing proxy. Nor does the transmission of information have to mirror the genetic analogy directly. Both ‘mutation’ and ‘combination’ can have as precise a meaning to comparative sociologists studying the reproduction and diffusion of memes and practices as to computer scientists splicing codes for programs and crossing them over in order to see what happens next. It is the language in which historians’ accounts of cultural and social change are conventionally narrated which is metaphorical: new ideas do not literally ‘march forward’ or ‘take off’ or ‘surmount barriers’, as they do in countless history books, any more than rebellions against the institutional *status quo* are literally ‘ignited’ or ‘defused’ or ‘undermined’ in countless others.<sup>2</sup> ‘Fall of the Roman Empire’ is as much a metaphor as ‘changing climate of opinion’, or ‘bourgeois ascendancy’, or ‘industrial revolution’, or ‘seeds of popular discontent’, or ‘wave of protest’. The two most famous metaphors in the literature of sociology – Marx’s ‘base and superstructure’ and Weber’s ‘elective affinities’ – have been as misleading as they have been influential. However difficult it may be to explain why some items or complexes of information affecting phenotype are favoured over time by competitive selection where others are not, it is a matter of literal fact that in cultural evolution some mutations or combinations of information transmitted by imitation or learning are more successfully reproduced and diffused in adjacent or successive populations of carriers than others, just as in social evolution are some mutations or combinations of information encoded in practices defining institutional roles.

At this point, the alliance between the anti-Darwinians and the ultra-Darwinians breaks down, since they have wholly incompatible opinions about how it comes about that the collective behaviour-patterns observed

<sup>2</sup> When, for example, a historian of Britain tells how in the late seventeenth century ‘high culture moved out of the narrow confines of the court into diverse spaces in London. It slipped out of palaces and into coffee houses, reading societies, debating clubs, assembly rooms, galleries and concert halls; ceasing to be the handmaiden of royal politics, it became the partner of commerce’ (Brewer 1997: 3), what he is literally narrating is the diffusion of competitively selected memes previously carried within aristocratic status-groups into environments favourable to their probability of further reproduction. And when another (Blanning 2002: 15) says that ‘The public sphere was a neutral vessel, carrying a diversity of social groups and ideologies. Depending on the date of its journey, its carrier is usually labelled ‘scientific revolution’, the ‘crisis of European conscience’, or the ‘Enlightenment’. These, together with plenty of others, do not have to be thrown overboard, but the argument will be advanced here that room needs also to be found for freight with a less modern or progressive appearance’, his metaphorical way of putting it cries out – metaphorically speaking – to be cashed in the literal language of selectionist theory.

in different human cultures and societies are what they are observed to be. To the ultra-Darwinians, cultural and social selection must ultimately be reducible to natural selection: mutations in heritable information, however transmitted, are fit and hence selected if and only if they somehow maximize the inclusive reproductive fitness of the organisms carrying them. But to the anti-Darwinians, this presumption is even more unpalatable than the suggestion that cultural and social selection, although not reducible to natural selection, are significantly analogous to it: for them, human cultures and societies can only be explained in their own terms without reference to any theory, model, or analogy drawn from biology. But on any serious reading of the literature of comparative sociology, it is as obvious that not all cultural and social variation can be explained by natural selection as it is that there are many aspects of human cultural and social behaviour which natural selection does explain (however reluctant the anti-Darwinians may be to acknowledge it). Some behavioural ecologists, when confronted with as challenging a counterexample as a creed which enjoins monastic and clerical celibacy, will go to extravagant lengths to find some hypothesis about inclusive reproductive fitness which is consistent with the data, just as some cultural anthropologists, when confronted with as challenging a counterexample as the universally higher probability of young adult males engaging in lethal violence than either older males or coeval females, will go to extravagant lengths to find some hypothesis which will link the data to presumptively autonomous cultural variables. But once Campbell's general point is taken, the question to be addressed is not which mechanism of heritable variation and competitive selection of information affecting phenotype is at work, but how those which are simultaneously at work relate to each other. At the three different levels of natural, cultural, and social selection, there are three different types of behaviour: *evoked* behaviour, where the agent is responding directly and instinctively to some feature of the environment; *acquired* behaviour, where the agent is imitating or has learned from some other agent, whether directly or indirectly; and *imposed* behaviour, where the agent is performing a social role underwritten by institutional inducements and sanctions. To cite another familiar topic – warfare: a comparative sociologist who studies it is at the same time studying the evoked behaviour of young adult males genetically predisposed to initiate or respond to violence under arousal or provocation, the acquired behaviour of members of cultures in which violence on behalf of the in-group is positively valued and successful warriors admired, and the imposed behaviour of recruits into their societies' military roles in which they are subject to formal punishments



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for disobedience or desertion whatever the memes acquired by imitation or learning which they are carrying inside their heads.

Darwin's legacy to comparative sociology, therefore, carries an injunction to reanalyse the evidence of the archaeological, ethnographic, and historical record in terms of heritable variation and competitive selection of information affecting phenotype in something of the same way that Darwin himself reanalysed evidence reported by 'pre-Darwinian' observers of animal species. His own occasional sociological asides are, admittedly, not very felicitous. No present-day sociologist will gain much from being told that 'The Greeks may have retrograded from a want of coherence between many small states, from the small size of their whole country, from the practice of slavery, or from extreme sensuality' (1882: 141).<sup>3</sup> But the neo-Darwinian sociologist's objective is in principle no different from that of the neo-Darwinian biologist as set out by Francis Crick (1988: 139): 'To produce a really good biological theory one must try to see through the clutter produced by evolution to the basic mechanisms lying beneath them, realizing that they are likely to be overlaid by other, secondary mechanisms.' In comparative sociology, Crick's 'clutter' is 'noise' in its information-theoretic sense: sociologists have somehow to identify and trace from among all the enormous amounts of information affecting behaviour in the phenotype the heritably variable and competitively selected memes and practices without which the distinctive cultures and societies documented in the archaeological, ethnographic, and historical record would not have evolved into being what they are.

'ANY ANIMAL WHATEVER ...'

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Like Hume, to whom nothing was (in his own words) 'more evident' than that 'beasts' are endowed with thought and reason as human beings are, and Aristotle, who regularly calls animals *phronimoi* (i.e. endowed with practical reasoning), Darwin had no hesitation in attributing to both primates and domestic animals a range of both intellectual and emotional capacities shared with ourselves. Indeed he credits animals with jealousy, gratitude, emulation, vengefulness, shame, curiosity, deliberation, memory, association of ideas, imagination, wonder, and even the rudiments of

<sup>3</sup> A very different answer to this longstanding question is put forward in tentatively selectionist terms in Runciman (1990).

a moral and aesthetic sense and a sense of humour. To many of his readers then and since, this has seemed unwarrantably anthropomorphic. But his observations have largely been vindicated by primatologists and ethologists who have been working in the field since the 1960s. Not only did he anticipate their findings about tool-use as well as deception, but unlike many twentieth-century ethologists he was fully aware of the significance of intra-specific variation in attributes and capacities. When, therefore, the primatologist Frans de Waal, in his book *Chimpanzee Politics* of 1982, made the names of 'Luit', 'Nikkie', and 'Yeroen' almost as familiar to a large general readership as those of the characters in the novels of Dickens, his observations would have been less surprising to Darwin than they initially were to de Waal himself.

But although the accumulated long-term field-studies of chimpanzee behaviour have revealed far more extensive cultural variations than previously supposed (Whiten *et al.* 2003; McGrew 2004), rapid and cumulative cultural evolution is unique to humans. Social, as opposed to individual trial-and-error, learning generates traceable cultural traditions in many other species. But ready as Darwin was to assign meaning to the sounds made by dogs and birds as well as monkeys and apes, he willingly conceded human beings' 'almost infinitely larger power of associating together the most diversified sounds and ideas' (1882: 85–6). He never underestimated the difference made by language, and would not have expected other than that even the most carefully trained adult chimpanzee should still lack the linguistic capacity of any normal human three-year-old. He only insisted, as he was right to do, that it is natural selection which explains how we come to have a capacity for language which other primates don't. We are an ape whose distinctive characteristics, including that one, arise out of 'descent with modification', not out of 'special provision'. The anti-Darwinians who like to point out that Darwin conceded to his critics that natural selection might not be able to explain as much as he had appeared to claim have themselves to concede that he would not have needed to do so if he had known what we now know about how natural selection actually works.

Darwin, accordingly, set the agenda for the study of human as well as animal behaviour to a degree that his successors for a long time failed to recognize. In particular, the joint influences of twentieth-century cultural anthropology on the one side and twentieth-century behaviourist psychology on the other can be seen with hindsight to have done as much to retard as to advance our understanding of the relation of the outward and visible uniformities in behaviour which make human cultures and