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Introduction

1.1 A TRAIN RIDE

In 1982 I had the pleasure of riding in a train across part of southern Ontario in Canada with the late Bill Hamilton who many think introduced the greatest innovation in the theory of evolution since Darwin – the theory which came to be known as "kin selection" or "inclusive fitness" (1964 a,b). Hamilton had pointed out that selection would act on (and hence calculations of fitness should take into account) not only the effect of our genes on our own behaviour, but also their effect on relatives, because the latter, to varying degrees depending upon the relationship, are carriers of the same genes identical by descent. For example, a gene which influenced one to assure the survival of a little more than two full siblings at the cost of one's own life would be favoured by selection because, on average, it would be transmitted through a relative rather than personally. His insight, model and initially suggested applications went on to give rise to a vast lineage of research on cooperation among relatives in nature. It was this work that stimulated Edward O. Wilson to write his *Sociobiology: The New Synthesis* (1975) which had caused such a stir among social scientists while I was a graduate student.

We were leaving a conference in Kingston Ontario and ended up on the same train. I was getting off at my home, Toronto, while he was going on further. I did not want to bother him and took a different seat but he came over and joined me. We discussed a variety of things in a few hours. He kindly relieved my embarrassment at having presented a paper at the conference which reinvented something that, unbeknownst to me at the time, part of which he had already published. It was about some implications of asymmetry in sex chromosome inheritance. Instead of adding to my embarrassment he complemented me on having got the numbers right. He

also wondered why, in the human species, it is females who tend to ornament themselves, while in most other species it is males. I suggested the former impression might be a result of sampling error and not representative of the diversity of human societies and cultures across the five to seven million years of history since we diverged from our common ancestor with chimpanzees, and provided a few examples. We also discussed his theory that antagonistic coevolution with parasites is responsible for the maintenance of sex – sexual species may manage to resist the onslaught of their much more rapidly evolving parasites by recombining their genes in every generation, making parasite populations, in effect, start their "pursuit" all over again. In making that argument he had noted that our first line of defence is the adaptive immune system which functions in many respects as a mini-evolutionary process taking place within the organism. I explained that the individual learning process by reinforcement and punishment is also such a miniature evolutionary process which takes place within the organism.

But most of all, we discussed the landscape we were travelling through – particularly the fact that it was at least as much marked by culture as by biology. We noted the land strewn with human artifacts – the roads, tracks, overhead wires, fences, farm houses, villages and towns, domesticated species, and the cleared (and not uncommonly again abandoned) fields being replenished with a new ecosystem of mixed native and once cultivated species gone wild. I was subsequently very surprised and disappointed then, as the three volumes of his collected works accompanied by reminiscences of their genesis and publication appeared after his tragically early death, to learn of his shockingly out-dated and dangerous eugenicist views. Parents should be free to practise selective infanticide; those who want to keep a "vegetable baby" alive should be required to pay for it (2001 V 2:xiviii); caesarean birth rates put us at risk of evolving a species incapable of giving birth naturally and so on he argued. How could one with so kindly and gentle a nature, in both my own experience and the accounts of others, be so wrong in ethical matters as to endorse views that in the past have contributed to discrimination, forced sterilization, murder and genocide? With respect to science rather than ethics, how could a scientist who had been so brilliantly original in his papers and who had chatted so freely with me about culture, ultimately have been so obtuse on the topic of psychology and the social sciences? As one reviewer of the second volume (Hamilton 2001) put that point:

> Hamilton's line connecting the behaviour of animals to that of humans was short and straight, the evolution of the human brain having done little to warp or extend it. His biologisation of our species accordingly pervades the (first) two volumes, but is more prominent in the second (Barry 2003).

It made me wonder for a time if the critics were right, if there was something intrinsic to evolutionary theory that fostered such views. After the initial shock wore off, I remembered that for every prominent evolutionist who expressed such eugenicist views, there were more who denounced them (e.g. Gould 1981, 1996; Lewontin, Rose and Kamin 1984). For every evolutionary biologist who thought that genes count for everything and culture for nothing, there were similarly renowned ones who made a point of acknowledging the potential significance of cultural evolution (Dawkins 1976:191–201, 322–31; Maynard Smith and Warren 1982; Williams 1992:15–16, 18–19; Maynard Smith and Szathmary 1995:309; Futuyma 1998:4) and some had even made it a focus of their work (Cavalli-Sforza and Feldman 1981; Ehrlich 2000). For these kinds of reasons, it is important that I make clear right at the beginning what this book is not, as well as what it is, about.

First it is not about the application of gene-based biological evolutionary theory to human behaviour (sociobiology, human behavioural ecology, evolutionary psychology, etc.) which is not to deny its utility. Shorn of racist and eugenicist views, as with a few rare exceptions it currently is (albeit sexism is another story), evolutionary biology applied directly to humans has yielded a great many interesting insights about human nature, the history of human populations and even their health.

1.2 DEVELOPMENTALISM

Secondly, it is not about the developmental stage theories of historical "progress", what Karl Popper (1957) called "historicism", and that have been called evolutionism for most of the history of the social sciences. In those theories, societies, cultures or particular institutions are proposed to necessarily pass through (some) particular sequence of stages. For example:

> Societies or cultures were held to develop from despotism through monarchism to republicanism (Montesquieu), from the theological through the metaphysical to the scientific (Comte), from status to contract (Maine), from the primitive through the feudal and capitalism

> to the socialist (Marx), from savagery through barbarism to civilization (Morgan), from gemeinschaft to gesellschaft (Toennies), from the ideational through the idealistic to the sensate (Sorokin), from folk through feudal to industrial (Redfield), from mechanical to organic solidarity (Durkheim), etc. The family was proposed to develop from sexual promiscuity through the matrilineal family through the patrilineal family to the conjugal family; the economy from gathering, through hunting, through herding through agriculture to industry; technology from wood, through stone, through bronze to iron; legal systems from communal to private property or from status to contract; religion from magic through animism through totemism to belief in a personal deity; and for the polity there were many sequences but all ended in democracy. (Blute 1979:47)

Sanderson's excellent recent history of evolutionism in sociology and anthropology (2007) sees slightly modified versions of such stage theories of history as the essence of evolutionism in the social sciences. He adopts Wright's (1983) criteria that evolutionary theories must have three features.

> 1. It must propose a typology of social forms with potential directionality.
> 2. It must order these social forms in the way it does on the assumption that the probability of remaining at the same stage in the typology is greater than the probability of regressing.
> 3. It must assert a probability of transition from one stage of the typology to another. (2007:5)

In evolutionary biology, passing through a characteristic sequence of stages is something that *individual* members of evolving populations rather than populations, species or higher taxa themselves do. Such theories are more akin to developmental than to evolutionary biology and are more aptly characterized as such. This is not to claim that so many distinguished social scientists were wholly wrong. For example, hunting and gathering wild food *was* the primordial mode of human subsistence. Horticulture (small-scale agriculture with human labour using hand tools), intensive agriculture (farming with energy from animals yoked to plows), and industrialism (in which human and animal labour is largely replaced by machines using fossil fuels) *did* branch off successively later (Blute 2008b). However, the emergence of such novel modes of subsistence accompanied by new forms of social organization are more akin to what biological evolutionists historically called "grades" and more recently have called "major transitions" (Maynard Smith and Szathmary 1995) – transitions such as the

emergence of the more complex eukaryotic from simpler prokaryotic cells, or of multicellularity from unicells, than they are to any necessary sequence of stages universal to some class of units. Such increases in complexity in some lineages (or even progress if one's values lead one to label them as such) are part of the story of evolution and that should not be forgotten, as Arthur (2006) has recently emphasized for biology. However, while the logic of the evolution of such increases in complexity is discussed here in Chapter 8, they are only one part of the larger picture of innovation and recombination, differential proliferation under selection, and diversification of species, which characterize the branching tree of an evolutionary process.

These traditional theories were commonly developmental in a second sense in that the process of change itself was commonly understood in terms that a biologist would recognize as developmental rather than evolutionary. Multicellular development and evolution are deceptively similar – both involve growth (the proliferation of cells in development, of individuals in evolution), a branching process (differentiation in development, diversification including speciation in evolution), and interactions among the "branches" (normally cooperation based on a division of labour in development but any or all of competition, conflict and cooperation in evolution).

A classic example of such developmental theories of social change was the work of the English polymath, Herbert Spencer, perhaps the most misunderstood theorist in the history of the social sciences. Stereotypes would have it that Spencer took Darwin's theory of evolution and tried to apply it to society. In fact, rather than being inspired by Darwin, Spencer was a believer in free enterprise from the beginning as was made clear in his first book, *The Proper Sphere of Government* (1842) which expressed his faith in nineteenth-century liberalism, the common intellectual coin of the time in England. Subsequently, his famous essays on "the development hypothesis" (which could profitably be read by evolution-deniers today) and on "Progress: Its Law and Cause" (making clear the developmental nature of his theory of change) were published seven (in 1852) and two (in 1857) years respectively before the first edition of *On the Origin of Species* in 1859. Reviewing a textbook of physiology drew his attention to the work of the German embryologist Karl Ernst Von Baer on differentiation in development. Rather than Darwin, Von Baer was the immediate inspiration for Spencer's "theory of everything" that progress consists of transitions from the homogeneous to the heterogeneous accompanied by integration – as he makes clear in his

autobiography (1904, II, 8–13 & 165–170) – and was the source of his expectation that free competition would result in cooperation rather than conflict.

> From the lowest living forms upward, the degree of development is marked by the degree in which the several parts constitute a cooperative assemblage (1862:276).
>
> Nothing like a high type of social life is possible without a type of human character in which the promptings of egoism are duly restrained by regard for others (1873:198).

Spencer believed that governments should not provide poor relief for example, not because the competition required for progress demanded that the unfit go to the wall so to speak, but because he thought that government interference would frustrate the development of private charities. Towards the end of his life Spencer was depressed that people were not living up to his expectations that they would create the cooperative "social state" which he had envisaged and became something of a misanthrope. Some (e.g. Peel 1971:137) have emphasized an origin in social rather than biological science for Spencer's emphasis on specialization and cooperation – Adam Smith by way of Milne-Edwards on "the biological division of labour" which Spencer also mentions. There can be no doubt, however, that while mentioning this, Spencer's autobiographical account emphasizes the embryological influence. Again, be what it may, Ghiselin got to the heart of the matter. Spencer "assumed that individuals act in the ultimate interest of society" (1974a:224). Not exactly assumed, however – rather cooperation emerges as a consequence of crowding, and among people for example, characterizes industrial society.

Later, the conception of change of the theorist most responsible for the institutionalization of sociology in the nineteenth century, Emile Durkheim, was similarly developmental, and indeed indebted to, Herbert Spencer (Corning 1982). In *The Division of Labour in Society* (1893) Durkheim conceptualized society as being, like an organism, an entity which passes through stages while it grows (increasing in density and frequency of interactions) and develops. It develops in the sense that it becomes (a) increasingly internally more heterogeneous, for example in its occupational structure, and (b) increasingly internally more functionally interdependent – all changes which Durkheim called the transition from "mechanical" to "organic" solidarity. He offered as evidence for such a transition the increasing quantity and importance of contract law regulating relations between individuals

and groups as opposed to criminal law. He offered as an explanation for the transition – need. Growth makes specialization and cooperation necessary and they appear because they are needed. Durkheim's *Elementary Forms of the Religious Life* (1912) is in the same vein – religion appears in the historical development of human societies universally because it is needed for social solidarity.

Later developmentalism was the source of inspiration for the general systems theory of Bertalanffy (1968) whose earlier work was on developmental biology and for his followers in sociology (Buckley 1967). It was also the version of functionalism finally settled on by Talcott Parsons (1966; albeit like so many others, he called it evolutionism). According to Parsons (1973:72) his functional theory of change was "most closely analogous to the process of growth in the organism", a "process of structural differentiation and the concomitant development of patterns and mechanisms which integrate the differentiated parts". Indeed, the developmental influence continues to linger at least terminologically, if not otherwise, in the use of terms like "development" (found everywhere) and "morphogenesis" (e.g. Archer 1995) derived from embryology for cultural and social change.

1.3 DARWINIAN SOCIOCULTURAL EVOLUTION

If it is not about sociobiology or about developmental-stage theories of historical progress, what is this book about? Contemporary Darwinian rather than developmentally inspired theories of change in the social sciences come in three broad forms – the gene-based biological (sociobiology, human behavioural ecology and evolutionary psychology), the social learning or meme-based sociocultural, and dual inheritance or gene-culture coevolutionary theory. This book is about the second – about sociocultural evolution. Again, this is not to deny the utility or importance of the others (in my own career for example, I have published in all three areas). However, I am most excited about the possibility of a unification of the social sciences themselves within a broadly synthetic sociocultural evolutionary framework. Ultimately, of course, both life and social scientists will also have to face up to the interaction between evolution in the two realms. While some progress has been made on the topics of dual inheritance and coevolution (e.g. Boyd and Richerson 1985; Durham 1991; Feldman and Laland 1996; Richerson and Boyd 2005; Blute 2006a), there is still a long way to go. While the relationship or interaction between the two is not the subject of this

book either, it will be returned to in the final chapter on the future of the social sciences.

Sociocultural evolutionary theory in the second sense, which is the subject of this book, the social learning or meme-based variety, has been bubbling up from the bottom in recent decades. It is being developed and applied in virtually every social science discipline. These include the study of languages, technology both prehistoric (archaeology) and historic, science, economic organizations and institutions and memetics as well as, to some degree, in the most general social science disciplines including anthropology, sociology and even history. We will not so much be considering the story of sociocultural evolution, which, after all, is the story of all of human history, but the process. By now, a rather large literature has accumulated and there is fairly wide agreement on the most basic elements of the process – commonly described after Hull (1988), for example, as replication, variation, interaction and selection. Replication is commonly thought to take place socioculturally by any mechanism of social learning (but see Chapter 5). Typically, it involves the transmission of ideas, (or "memes" suggesting memory and genes in Dawkins 1976 terminology) – "information such as knowledge, beliefs, and values that is inherited through social learning and expressed in behavior and artifacts" (Mesoudi, Whiten and Laland 2004, paraphrasing Boyd and Richerson 1985). Sociocultural evolution, at least when social learning takes place by linguistic instruction rather than simply by observation (Blute 2001a), includes an equivalent of the distinction between genotypes (digitally encoded information such as the genes influencing height) and phenotypes (observable characteristics such as height itself) in biology. Variations, including new combinations, are introduced from time to time.

These socially learned "iss" and "oughts" informing and directing behaviour have been given many terms in various social sciences through their history. Sociologists refer to "norms and values". Anthropologists once liked to talk about "folkways and mores" but today more often say "traditions" (albeit some students of animal behaviour like to call animal cultures "traditions" to distinguish them from human culture). Linguists speak of "rules" or "competencies"; institutional, including evolutionary economists and organization theorists of "conventions", "habits", "routines", and "competencies". Archaeological speak is quite varied – "techniques", "design elements", "traits" and "traditions", for example, are fairly common. In science studies they speak of concepts,

theories and methods but also of more inclusive entities such as "research programmes" and "paradigms". In any event according to evolutionists, such socially learned information and instructions, commonly embodied in social roles, statuses or identities, interact with each other, with other inherited resources such as wealth, income, power and status and with the environment yielding the visible behaviour and artifacts characteristic of some particular social identity. As a result of this, some social identities prove more viable and more successful at recruitment than do others, and hence their beliefs and values become relatively more common, i.e. selection and evolution in the form of statistical changes in a population take place. Molecular biologists out-compete cell biologists; specialists doctors out-compete general practitioners; born-again Christians and Islamists out-compete more traditional denominations of their religions and so on. As with viruses in biology, in an era of mass communications particularly, information more or less disembodied from particular social identities can also spread horizontally and evolve as well, a fact often emphasized by memeticists to many of whom a meme is simply "an idea that spreads". "Information wants to be free" as Stewart Brand so famously declared and Web enthusiasts constantly remind us.

Some differences of opinion remain, of course – about the choice of terms as above and about the mechanisms involved in social learning or imitation, for example. Some view sociocultural evolution as analogous to the biological, while others prefer to think in terms of evolutionary epistemology (Campbell 1974), universal Darwinism (Plotkin 1994; Cziko 1995; Dennett 1995) or multi-process selection theory. This is the theory that all knowledge-acquiring and utilizing processes are selection processes and includes individual learning by reinforcement and punishment and certain aspects of the adaptive immune response (Hull, Langman and Glenn 2001) as well as biological and sociocultural evolution as special cases. When they first come to this kind of evolutionary theory in the social sciences, one of the first thoughts that often occurs to people is that cultural evolution is "Lamarckian" rather than "Darwinian". Superficially, the Lamarckian view seems plausible – individuals can learn things, by trial and error for example, and these "acquired adaptations" can be inherited as others learn socially from them.

The intricacies of the Darwinian versus Lamarckian argument in cultural evolution may be pursued in the literature by those interested (e.g. Murmann *et al.* 2004; Hodgson and Knudsen 2006; Kronfeldner

2006 and references therein) and is discussed here in Chapter 2. However, the bottom line I believe is three empirical issues. First, one may be uncomfortable with the notion that human innovation is "random" (meaning only "blind" i.e non-prescient, as Campbell 1965 put it). Even so, the fact is that there is no evidence in any area of human cultural activity that innovation is adaptive in the sense that it is *statistically* biased in the direction which would be required for it to spread further in the circumstances. In fact, the evidence is quite to the contrary – whether considering scientists publishing papers that will be cited, inventors obtaining patents that will be utilized, entrepreneurs founding new businesses that will succeed, or manufacturers introducing new products that will be successfully marketed (Blute 1979). Most cultural innovations, like most biological mutations, fail. Even cultural innovations that do succeed often do so in a niche quite different from that which their originator anticipated. Secondly, while acquired characteristics may be inherited culturally (as they may indeed be inherited biologically; Jablonka and Lamb 2006), they are not necessarily. A good example is religious beliefs. We may inherit religious beliefs from our parents as part of a social identity as a church member and then abandon or change these as we grow up. Not uncommonly, however, we send our children for religious instruction anyway, i.e. we do not pass on what we have since acquired but what we originally inherited. Thirdly, in the context of multi-process selection theory, when an innovation is adaptive on one level, for example rewarding to an individual, that does not mean it will be successful on a more inclusive level, for example socioculturally. A scientist may learn something in his or her own research but have difficulty persuading colleagues. Juan Delius once pointed out in conversation that masturbation and nose picking may be rewarding but they are not successful social norms!

Lamarck is remembered as having introduced the first theory of biological evolution that at least tried to explain adaptations. Environments create a need – trees grow taller; giraffes adapt by stretching their necks; and their offspring, as a consequence, inherit longer necks on this view. In suggesting there might be a naturalistic explanation for adaptations and that, in striving for complexity, it is the need to adapt to the environment that drives organisms off the medieval "great chain of being" (Lovejoy 1936) creating the tree of life, one might argue that Lamarck raised the question that made Darwin's achievement possible. Most nineteenth- and early twentieth-century biologists, including Darwin, accepted such scenarios, although