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1
Prospect

DEATH OF A PARADIGM

Neo-Darwinism is dead. The paradigm that has long dictated the terms of accommodation between the sciences of life, mind, society and culture has been brought down by the weight of its own internal contradictions, by the manifest circularity of its explanations, and by the steadfast refusal of human and other organisms to conform to the straitjacket that its architects had created for them. This is not to deny that it continues to enjoy massive public, political and financial support. Its leading protagonists are among the biggest 'names' in science. In a market-driven environment, they have become celebrities and their doctrines have become brands. They have run a propaganda machine that has been adroit in playing to popular stereotypes and ruthless in the suppression of dissenting voices, variously dismissed as ill-informed, politically motivated or temperamentally hostile to science. Some adherents of the neo-Darwinian creed have feigned puzzlement as to why so many scholars in the social sciences and the humanities refuse to sign up to it. This has been attributed, variously, to disciplinary myopia, sheer prejudice, or the allure of such fads and fashions as post-modernism, relativism and social constructionism (Perry and Mace 2010). The one possibility that adherents cannot countenance, however, is that their critics – many of whom are more widely read in the histories and philosophies of science and society than they are, and have thought long and hard about the conditions and possibilities of knowing and being in the one world we all inhabit – might have good reasons to find the paradigm wanting. To admit as much would, after all, be to question the very foundations of their own belief.

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Rather than seeking to counter the critical arguments that have been levelled against it, their strategy throughout has been to question the intelligence, competence and integrity of those who articulate them. This strategy marks the paradigm out as a form not of science but of fundamentalism.

In a nutshell, neo-Darwinism rests on the claim that variation under natural selection is both necessary and sufficient to explain the evolution of living things. This is not, as its advocates never tire of reminding us, a claim of genetic determinism. It does not presuppose that the units that are transmitted from generation to generation, and whose mutation, recombination and differential propagation are supposed to account for evolutionary change, are genes. The only conditions are that these units should be replicable and should encode information. When it comes to humans, for whom so much of what they do and know is ostensibly learned rather than innate, and to a lesser extent perhaps for many non-human creatures as well, it would appear that much information is transmitted cross-generationally by means other than genetic replication. Those who would integrate the human sciences into the neo-Darwinian fold have co-opted the notion of culture to refer to this informational component, arguing that its transmission attests to a second track of inheritance, running in parallel to the first track of genetic inheritance (Levinson 2009, Ellen 2010; see Palsson, Chapter 12, this volume). By analogy to genes, the replicating units of the second track have been christened 'memes'. Neo-Darwinians are themselves divided on the issue of precisely how these tracks intersect, if at all. Some, writing under the banner of evolutionary psychology, would say that the innate architecture of the human mind, shaped through the natural selection of genetically prescribed attributes under environmental conditions encountered by our most remote ancestors, strongly constrains the kinds of information that can be received, processed and passed on, and therefore imposes strict limits on the forms of transmitted culture (Tooby and Cosmides 1992, Sperber 1996). Others, keen to establish a new field of 'memetics', argue that memes can take over the mind much as a parasite can take over its host, and that they will be differentially represented in a culture to the extent that they cause the infected host to behave in ways conducive to infecting everyone else (Blackmore 2000). Either way, there appear to be two processes of evolution taking place at once, biological and cultural, by way of the variation and selection of, respectively, genes and memes (Durham 1991, Richerson and Boyd 2008).

This is the view of biology and culture, and of their co-evolution, that upholders of the neo-Darwinian paradigm like to present as on

the cutting edge of science. For them, it offers the promise of a unified approach that would accommodate the entire spectrum of the human sciences under one roof. A symposium staged in London in June 2010, entitled *Culture Evolves*, purported to crown it with the unqualified approval of the scientific establishment. The meeting was one of a series of events celebrating 350 years since the founding of the Royal Society, and was co-sponsored by the Society and the British Academy. It would be hard to imagine a more high-profile or prestigious platform for launching what modern science has to say about culture and its evolution. The synopsis for the meeting read as follows:

> The capacity for culture is a product of biological evolution – yet culture itself can also evolve, generating cultural phylogenies. This highly interdisciplinary joint meeting . . . will address new discoveries and controversies illuminating these phenomena, from the roots of culture in the animal kingdom to human, cultural evolutionary trees and the cognitive adaptations shaping our special cultural nature.[1]

It is perhaps no accident that among the distinguished speakers, who included psychologists, ethologists, primatologists, archaeologists and biological anthropologists, there was not a single representative from social or cultural anthropology. For the language in which this synopsis is couched – including the divisions between biology and culture and between innate capacity and acquired content, the notion of evolution as a designer and shaper of products, and the idea (implicit in the concepts of cultural phylogeny and cognitive adaptation) that the thoughts and actions of living beings are orchestrated and controlled by programs assembled from particles of transmitted information carried around in their heads – is one that belongs, in the annals of the discipline, to a bygone era. Indeed it has long since been exposed as a sham by critical anthropologists who have drawn attention to the politics of knowledge that sets modern science and enlightened scientists over and above evolved culture and its supposedly traditional carriers. If the purveyors of this language were to take a taste of their own medicine, by treating their science as an evolved cognitive adaptation and its history as a line of phylogenetic descent, what possible credence could we attach to it?

[1] See http://royalsociety.org/events/2010/culture-evolves/.

DOES CULTURE EVOLVE?

Indeed the very first sentence of the synopsis for *Culture Evolves*, though advanced as a proposition whose truth is self-evident and beyond question, is manifestly false on three counts. First, the notion that there exists an evolved 'capacity for culture', universally present in humans in advance of the diverse content with which it is subsequently filled, is a classic example of what the philosopher Whitehead (1926) called 'misplaced concreteness' – an essentialism that fallaciously assigns a material presence, in human bodies and minds, to abstractions born of our own analytic attempts to establish a baseline of commensurability that would render all humans comparable in terms of similarities and differences. Under the guise of this capacity, evolutionary science projects onto our prehistoric forbears an idealized image of our present selves, crediting them with the potentials to do everything we can do today, such that the whole of history appears as but a naturally preordained ascent towards their realization in modernity. This is hardly a new view, having already been articulated in strikingly similar terms in the eighteenth century by thinkers of the Enlightenment whose project contemporary evolutionary psychologists, ignorant of the history of their own science, appear unwittingly to be recapitulating. Secondly, the opposition between the biological and the cultural is incoherent. It effectively reduces the biological to the innate, by contraposition to cultural forms allegedly acquired by non-genetic means, thus excluding from 'biology' the entire gamut of ontogenetic or developmental processes by which humans and other animals become skilled in the conduct of particular forms of life, while treating these skills, in so far as they vary between populations, as no more than the outward expressions of an informational supplement supplied by transmitted culture. Thirdly, and following from this, the notion of cultural phylogenies rests on an obsolete model of transmission. Linked as it is to a genealogical model that separates the acquisition of knowledge-as-information from its practical enactment, it is ill suited to describe the ways in which humans and non-humans ordinarily come to know what they do, which, as many studies have confirmed, is rather through a process of growth and guided rediscovery.

What, then, is culture? Does culture evolve? On the first score, we would say that culture is the name of a question, but it is *not* the answer. The question is: why does life, especially human life, take such manifold forms? To answer that these forms are due to culture is patently

circular. The neo-Darwinian paradigm, applied to cultural as to biological evolution, is locked in this circularity. Despite much vaunted claims to the contrary, those who work within the paradigm have come up with absolutely nothing by way of an answer to the question of culture. Their procedure is rather to re-describe complex and multifaceted, 'phenotypic' outcomes in crudely one-dimensional terms by excluding all contextually specific or so-called 'proximal' aspects that could potentially contribute to an answer, such as intentions, sensibilities, the affordances of the environment, socio-historical conditions, and the dynamics of ontogenetic development. The idea is to come up with a model of observed behaviour, a 'culture-type' (strictly analogous to the 'genotype' of biology), that is entirely context-independent. It is then supposed that this model is pre-installed inside the heads of individual carriers whence it is alleged to generate the described outcomes under the particular environmental or contextual conditions they happen to encounter. Thus, in effect, is culture 'ultimately' explained by culture. And the logical operator by which descriptions are converted into explanations, or behavioural outcomes into cognitive dispositions, is none other than variation under natural selection, here applied to culturally rather than genetically transmitted particles of information, memes rather than genes. Of course there is no denying that signs, words and ideas proliferate in the milieu wherein human lives are carried on, just as the lengths of DNA comprising the genome proliferate in the multicellular matrix within which organic forms germinate and grow. The logic of natural selection, however, requires that these signs, words and ideas, like segments of the genome, come pre-encoded with information which specifies the practices or attributes that contribute to their proliferation. This is the move that closes the loop of Darwinian explanation. Yet there is no known mechanism by which meaning can jump into minds or molecules in advance of their instillation into the life process.

Neo-Darwinian theorists have three ways of covering up the elision of *explanans* and *explanandum* entailed in this logic. One is to prevaricate over the meaning of evolution itself. At one moment it refers to changes in the relative frequencies with which allegedly self-replicating entities such as genes or memes are represented in a population; at the next to changes in manifest forms of life. Thus by a sleight of hand, it is made to appear as if having explained the one, you have explained the other. Another way is to conflate, under the concept of the 'gene' or 'meme', material instantiations (whether genomic or neural) with elements of a formal character description, commonly

known as 'traits' (Moss 2003). It is this conflation that supports the illusion that segments of DNA, or their neural equivalents, encode a priori for particular practices or attributes, such that genes or memes can be said to be *for* this or that. A third way is to partition the question of how things evolve from the question of how they grow or develop, as though ontogenesis were an entirely tangential spin-off from the evolutionary process itself. Thus it appears that biological evolution is actually the evolution of the genotype, and cultural evolution the evolution of the 'culture-type'. Yet in the real world there are no genotypes and no 'culture-types'. They are models built up after the fact, constructs of retrospective analysis. It follows that neither biological nor cultural evolution – as understood within the neo-Darwinian paradigm – can occur in the world that organisms or persons actually inhabit. Such evolution can only occur in the space of abstract representations.

With this conclusion in mind, we can return to the second of the two questions posed above: 'Does culture evolve?'Clearly, in the real world, there is no such entity as 'culture' which could conceivably be said to evolve, let alone to be a product of evolution. Yet in so far as forms and practices change, over longer or shorter periods of time, there is no doubt that evolution, of a kind, does go on in this world. We could even argue that in the dynamics of this evolutionary process, and in the forms that arise within it, we can find possible answers to the question of culture: 'why does human life take so many, and such varied forms?' However this means thinking quite differently not only about culture, but also about evolution.

ON HUMAN BECOMINGS

Evolution, in our view, does not lie in the mutation, recombination, replication and selection of transmissible traits. It is rather a life process. And at the heart of this process is ontogenesis. The failure to account for the ontogenetic emergence of phenotypic form is the Achilles heel of the entire neo-Darwinian paradigm. For it has proceeded as if the form were already there, prefigured in the virtual space of the genotype or its cultural equivalent. The work of ontogenesis, then, is reduced to one of mere transcription, of the prefigured form or design into the material substrate of organic matter, or what used to be called 'protoplasm'. This way of thinking about the creation of things, whether living or artefactual, has been with us ever since Aristotle, in *De Anima*, introduced his distinction between form (*morphe*)

and matter (*hyle*), arguing that the thing itself is a result of the combination of the two. This so-called 'hylomorphic' model of creation is for example invoked, for the most part quite unreflectively, whenever biologists declare that the organism is the product of an interaction between 'genes' and 'environment'. The genes are introduced into the equation as carriers of received information, which is supposed to order and arrange the formless, 'plasmic' material of the environment in the actualization of the phenotypic product. Applied to culture, the logic is just the same, and just as deep-seated in the western intellectual tradition. The only difference is that the information is carried in the virtual space of memes rather than genes – that is, in a space of ideas that are imagined somehow to have entered into people's heads, with their meanings already attached, independently and in advance of any practical involvement in the world of materials. Whether with genes or memes, the fallacy of this way of thinking lies in supposing the form miraculously precedes the processes that give rise to it (Oyama 1985). And the way to overcome the fallacy is simply to reverse the order, so as to give primacy to the processes of ontogenesis – to the fluxes and flows of materials entailed in making and growing – over the forms that arise within them. Though the solution may be simple, however, the implications are profound.

We are accustomed to thinking of ourselves as 'human beings'. The term, however, hides a paradox that is apparent as soon as we stop to ask why we do not also speak of 'elephant beings' or 'mouse beings'. Are not elephants just elephants and mice just mice? By the same token, as individuals of the species *Homo sapiens*, are not humans just humans? The catch is that humans (and elephants, and mice) can appear as such only to a mind that has already set itself on a pedestal, over and above the natural world that appears to unfold like a tapestry beneath its sovereign purview. What such a mind sees, among other things, are *human beings*. And yet in the assumption of this sovereign position, unattainable to elephants and mice, is held to reside the essence of what it means to *be human*. It is on the basis of a claim to universal humanity, defined in the first place by the possession of reason and conscience, that science authorizes its conception of human beings as comprising just another – albeit rather remarkable – species of nature. The notion of culture, then, emerges as a compromise, as the condition of beings that, while they have broken the bounds of nature, nevertheless remain encapsulated, in their thought and practice, within the constraints of received tradition. Between species of organisms and the scientists who study them, between

nature and reason, human cultures figure as a middle tier in the overall scheme of things, above the former and below the latter. The very concept of the human, then, is fundamentally duplicitous: the product of an 'anthropological machine' (Agamben 2004) that relentlessly drives us apart, in our capacity for self-knowledge, from the continuum of organic life within which our existence is encompassed, and leaving the majority stranded in an impasse. To break out of the impasse, we contend, calls for nothing less than a dismantling of the machine. And the first step in doing so is to think of humans, and indeed of creatures of all other kinds, in terms not of what they *are*, but of what they *do*.

Another way of putting this, which lies at the foundations of what we attempt in this book, is to think of ourselves not as *beings* but as *becomings* – that is, not as discrete and pre-formed entities but as trajectories of movement and growth. Humanity, we argue, does not come with the territory, from the mere fact of species membership or from having been born into a particular culture or society. It is rather something we have continually to work at, and for which, therefore, we bear the responsibility (Ingold 2011: 7). Life is a task, and it is one in which we have, perpetually, never-endingly and collaboratively, to be creating ourselves. Each of us is instantiated in the world along a certain way of life or 'line of becoming' (Deleuze and Guattari 2004: 323), understood not as a corpus of received tradition but as a path to be followed, along which one can keep on going, and which others will follow in their turn. Thus unlike the incongruous hybrids of biology and culture created by the anthropological machine and conventionally known as human beings, human becomings continually forge their ways, and guide the ways of consociates, in the crucible of their common life. In so doing, they weave a kind of tapestry. But like life itself, the tapestry is never complete, never finished. It is always work in progress. Within it, we may recognize patterns, rhythms and regularities, and perhaps we might use the term 'culture' to refer to these. This is to acknowledge, however, that cultural forms arise within the weave of life, in conjoint activity. And evolution? This can only be understood topologically, as the unfolding of the entire tapestry – of the all-embracing matrix of relationships wherein the manifold forms of life that we call 'cultural' emerge and are held in place. Within this matrix, the becoming of every constituent both conditions and is conditioned by the becomings of other constituents to which it relates. These mutually conditioning relations together comprise what we can call an ontogenetic or developmental system. Forms of life, then, are neither genetically nor culturally preconfigured but emerge as

properties of dynamic self-organization of developmental systems. And evolution is their derivational history.

That life unfolds as a tapestry of mutually conditioning relations may be summed up in a single word, *social*. All life, in this sense, is social. Yet all life, too, is *biological*, in the sense that it entails processes of organic growth and decomposition, metabolism and respiration, brought about through fluxes and exchanges of materials across the membranous surfaces of its emergent forms. It follows that every trajectory of becoming issues forth within a field that is intrinsically social and biological, or in short, *biosocial*. That is why we speak of humans, in this volume, not as species beings but as biosocial becomings. We admit that the terminological compression of 'social' and 'biological' into 'biosocial' is far from ideal, since the word remains tainted by connotations of hybridity and mixture, as though one could forge the human by taking a given quantum of biology and adding to it a complement devolved from a superior source in society. It has long been argued, by social and biological theorists alike, that humans – perhaps uniquely among animals – have a split-level constitution, part biological, part social, and that only by putting the two parts together can we arrive at a comprehensive account of the whole. What we intend with the 'biosocial', however, is precisely the reverse. Our claim is not that the biological and the social are complementary, or that they pertain respectively to the level of discrete individuals and to that of the wider groupings into which they are incorporated, but that there is no division between them. *The domains of the social and the biological are one and the same*. But nor is this a reductionist claim. We are not reducing the social to the biological, or vice versa. The life of a becoming (which is also, of course, the becoming of a life) could be compared to a hempen rope, twisted from multiple strands, themselves twisted from multiple fibres, each in turn twisted from its cellular and molecular constituents. It could, in principle, be examined close up or from afar, microscopically or macroscopically. But at every level of resolution we find the same complexity, the same intertwining of threads, the same metabolic exchange. Like the rope, the becoming is biological all the way up, and social all the way down.

TOWARDS A GENERAL THEORY OF EVOLUTION

The scale of the rethinking we are calling for here can scarcely be overestimated. It is not a matter of tinkering around the edges, or of adding a few more varieties of selection or tracks of inheritance, to

complicate the standard neo-Darwinian picture. It is to rebuild our understanding of life and its evolution, and of our human selves, on entirely different ontological foundations. Without wishing to attach too much weight to the analogy, it is akin to the replacement of classical mechanics by the general theory of relativity. For most mundane purposes, Newton's laws of motion work well enough, since any differences between the results obtained from the application of these laws and from the principles established by Einstein would be vanishingly small. Likewise we can observe, as Darwin did (1872: 403), that while the planets have carried on in their revolutions around the sun just as Newton decreed they should, so – through the process that Darwin called 'descent with modification' – the most varied and wonderful forms have continued to evolve. But if this is to disregard the curvature of time and space brought about through gravitational mass, it is also to proceed as though every organism were a discrete entity, destined to act and react in a virtual space–time continuum in accord with its received attributes. Where for Newton the universe was a giant clock, for Darwin natural selection was a maker of watches, albeit without the intention to do so (Dawkins 1986). This mechanical conception of a clockwork world suffices as a rough approximation, so long as we keep our thinking selves well out of it. But once it is recognized that we too, in body and mind, are of the same flesh as the world, that there is no way of thinking or knowing that is not, in that sense, directed from within that which we seek to know, and that this knowing, in the practice of our science, is part and parcel of the process of becoming that makes us who we are and shapes our very humanity, this approximation is immediately exposed as the artifice it is. It is not enough to have one theory (of knowledge) for humanity and another (of being) for the rest of living nature. We need an evolutionary equivalent of the general theory of relativity that would allow our human trajectories of growth and becoming – including those of growing and becoming knowledgeable – to be re-woven into the fabric of organic life.

What follows are just some of the things that would have to be at the heart of any such theory. First, we can no longer think of the organism, human or otherwise, as a discrete, bounded entity, set over against an environment. It is rather a locus of growth within a field of relations traced out in flows of materials. As such, it has no 'inside' or 'outside'. It is perhaps better imagined topologically, as a knot or tangle of interwoven lines, each of which reaches onward to where it will tangle with other knots. This means, too, that we have either to change