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EVOLUTION AND THE ARTS OF CIVILISATION

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EVOLUTION AND THE ARTS OF CIVILISATION

ABSTRACT

There have been many attempts to apply evolutionary models to social change. This paper takes Darwin's account of artificial – as well as natural - selection as its starting point. It thereby brings together human intention and learning – the arts of civilisation – and the unintended processes of change with which evolutionary models are more usually concerned. It argues that policy science should be an evolutionary science, studying endogenous processes of technological and institutional transformation; but that it must be more than this, articulating political goals and policy trade-offs and illuminating the arts of civilisation as applied to society as a whole.

Keywords: Evolution, natural selection, artificial selection, social policy

1 INTRODUCTION

In 1898 Thorstein Veblen published his essay, 'Why is economics not an evolutionary science?' (Veblen, 1898: Ch 16). His argument was that economics *should* be an evolutionary science; but that it had not developed at such and was therefore inadequate to the tasks that it set itself (Hodgson, 1998; Boulton, 2010).

Veblen's target was neoclassical economics. Walras for example had sought to model economics on the physics of his day and thus to make it a 'real science' (Beinhocker, 2007). For Walras, this meant taking market equilibrium as its analytical centrepiece. Veblen however argued that this left no place for learning and the growth of knowledge. He wanted economics instead to imitate evolutionary biology, incorporating endogenous processes of innovation and transformation.

Since Veblen wrote, his plea has not gone unanswered. Even if Walrasian economics retains its grip on the neoclassical mainstream, evolutionary economics has become a significant if ill-defined heterodoxy: from Schumpeter and Hayek to Hodgson, Loasby and Metcalfe and, most recently, Potts and Beinhocker. Meanwhile other strands of heterodoxy - most obviously the Keynesian tradition (Kaldor, 1985) - have reinforced Veblen's critique of 'equilibrium' thinking.

The present paper shares Veblen's doubts about the value of 'equilibrium', as the taken-for-granted analytical heart of economics, or indeed any social science. Like Veblen, it finds in evolutionary science a more appropriate analytical inspiration, with learning and the growth of knowledge centre-stage. Nevertheless, just how evolutionary ideas should be applied to the social world is by no means obvious; nor is the relationship between evolution and politics and public policy. It is with these questions that this paper is concerned.

2 DARWIN'S JOURNEY REVERSED

Darwin (1859) offered an account of evolution through natural selection. The scarcity of food relative to the available population provokes an unending Malthusian competition for life, a 'struggle for existence'. However, in each generation some offspring embody new 'variations' which enable them to thrive and reproduce with greater success within their particular environment. (In modern Darwinism, we understand these variations in terms of genetic re-combinations and mutations.) These superior varieties then become progressively better-represented in successive generations. It is from these blind population dynamics – 'blind' in that there is no overall intent or purpose - that the differentiation and adaptation of species arise.

Those who champion evolutionary ideas are by no means agreed on just *how* they should be applied to the social world. For Dawkins, it is a matter of understanding social dynamics by reference to the demands of biological evolution. Thus for example it is by reference to the 'selfish gene' that we may wish to understand the evolution of cooperation and altruism in societies (Dawkins, 1976). His account of the evolution of cultural 'memes', on the analogy of the evolution of genes, likewise makes social evolution subservient to the biological template. In contrast, Odling-Smee (2003) is a biologist who recognises the distinctive role

played in human societies by cultural transmission, whose effects can indeed quite overwhelm those of biological selection.

Evolutionary economists such as those mentioned earlier go further, leaving no place at all in their analysis for biological selection.¹ New ‘variations’ emerge from the ‘animal spirits’ and inventiveness of entrepreneurs, in what Schumpeter described as ‘swarms of innovation’. In Darwinism, it is the genetic legacy of a species that is re-worked; in evolutionary economics, it is the technological and institutional legacy of the society. Political scientists such as Streek and Thelen (2005), in their account of institutional evolution, similarly locate new variations in the creativity of institutional entrepreneurs.

Amidst this variety, the present paper insists on a quite specific point of departure: *we must start by reversing Darwin’s journey*. Darwin’s account began with his observation of husbandry and artificial selection, as practised by the pigeon breeders and horticulturalists he knew, and indeed by Darwin himself on his estate (Darwin, 1859: Ch 1). The breeder or horticulturalist looked out for novel characteristics in the offspring of each new generation that would better meet his or her requirements. These superior varieties were then selected for breeding, so as to combine and progressively accentuate these advantages. From here Darwin made the mental leap to posit ‘natural selection’, with the harsh struggle for scarce sustenance culling the less fit as rigorously – albeit over a much longer time period – as the breeder or horticulturalist. In adapting his model of evolution and natural selection to human societies, we move back into the practices of active husbandry from which Darwin began.

These are the arts of civilisation. Instead of blind adaptation of a population to different environments, they involve reflection, learning, experimentation, collaboration and the growth of knowledge. This is true of the husbandry of pigeons and livestock and plants: it is also true of the ‘cultivation’ by entrepreneurs of new technologies and institutions. Husbandry here re-works the technological and institutional legacy - as distinct from the genetic legacy – in hope of producing variants more suited to human purposes.

This paper is therefore concerned less with natural selection and evolution, more with the breeder and artificial selection. Nevertheless, reversing Darwin’s journey involves more than simply shifting from blind and impersonal selection in the wild to the considered and intentional selection practised by the horticulturalist or the entrepreneur. Artificial and natural selection have a complex interrelationship.

1. The horticulturalist or pigeon breeder is never entirely separate from the wild, the arena of natural selection. On the one hand, it was from the wild that varieties that appeared of interest for human purposes were originally drawn; the wild continues as a source of further novelties, which the breeder can hardly afford to ignore. (Think for example of the efforts by corporations to identify – and even to patent – genetic novelties in remote corners of the earth that may prove commercially exploitable.) On the other hand, many of the species that human activity has selected and cultivated can survive and thrive only insofar as they are protected from the wild and its processes of natural selection (Pollan, 2003; 2006: Ch 2). In short, *artificial and natural selection are forever competing for turf*.
2. Artificial selection of pigeons and plants involves more than the breeder’s attentive observation of unusual characteristics in each new generation, and the selection of some for further breeding. Beyond the breeder, what is also involved is selection by the market – by the purchasers of these novel breeds. It is ultimately the preferences of consumers – not of the breeder - that dictate which novelties survive and thrive.

This is true not only of plant and stock breeders, re-working the genetic legacy; it applies to entrepreneurs more generally, re-working the technological legacy of their society to produce novelties that may better serve human purposes (Potts, 2000; Beinhocker, 2007). These entrepreneurs may of course seek through advertising and branding to shape consumer preferences. They can draw on their experience and their ‘mental models’ of the future, in trying to anticipate how things will turn out. Nevertheless, how a given technological innovation will fare – and how it may interact or be combined with other technologies and institutions – can never be entirely foreseen.

¹ This does not mean overlooking that human beings are biological organisms. They feed on other organisms; they are vulnerable to the ravages of new viruses; much of their economic and social activity is geared to the collective management of these challenges (Flannery, 1994: Part 2). Nevertheless, the variations that are thrown up in their social and economic technologies - and which are then variously selected and retained - are not biological. It is in this narrow sense that the analysis of societal evolution can and should ignore the biology.

In short, therefore, artificial selection *proposes* new variants: but it is processes of differential selection through the market that *dispose*; and these are just as collectively ‘blind’ and devoid of overall intent as the processes of natural selection that drive speciation in the wild.

3. Just as entrepreneurs bring forward technological novelties, institutional innovators bring forward new institutional forms (Pierson, 2004; Crouch, 2005; Streek and Thelen, 2005). These may involve new combinations of the institutional past, as well as institutional forms borrowed from elsewhere. Many may be ignored, but some will be adopted and adapted by social actors across the society. This again is selection by population dynamics.

Some new institutional forms may be introduced because they enable particular new technologies to thrive (North, 1990). Think for example of e-commerce as a new institutional form, enabling the new information and communication technologies to flourish. However, another common aim of institutional entrepreneurs is to construct new lines of institutional differentiation in the population, so as to consolidate their positions of advantage. Think for example of patenting and copyright. Think also of the efforts of middle class parents, to capture the best schools and limit working class access. Here institutional differentiation is not so much an impersonal and blind process of market dynamics, but in part at least *a struggle for positional advantage* within the population.

This then suggests a re-examination of the market itself, as a selection arena. Rather than blind population dynamics, selecting by reference to fitness for human purposes, the market must also, in part at least, be re-conceptualised in terms of more powerful actors shaping technological and institutional change, so as to secure their positional advantage within that population.²

4. Technological and institutional innovators practise what we earlier termed the ‘arts of civilisation’. This is also however a struggle for positional advantage, whose outcome may be anything but civil.

Darwin observes that ‘we behold the face of nature bright with gladness’ and its ‘superabundance of food’; but we too easily overlook the concomitant destruction of life entailed by the incessant ‘struggle for existence’ (Darwin, 1859: 50). The same goes for human affairs and the struggle for positional advantage. If below the surface of nature’s superabundance it is necessary to discern the struggle and destruction this entails, it is also necessary, below the order and regularities of social life, to discern *the exercise of power* by which these regularities are reproduced. If this is order, it is such only because some social actors have succeeded in negotiating or imposing that order on others.

Attempts to apply evolutionary models to the social world have in general neglected the exercise of power. By reversing Darwin’s journey, taking account of artificial as well as natural selection, we bring power centre-stage.

5. Darwin’s gardener or pigeon breeder brought human purpose to the ‘struggle for existence’: influencing the variations that appear, selecting among them, protecting them, shaping the ensemble of flora and fauna which would make up the garden as a whole. In human affairs no less, fundamental choices of public policy and purpose are posed, as to the directions of change that citizens and policy makers wish to cultivate, modifying the interests and power that drive the positional struggle. *This is husbandry of the social fabric, applying the arts of civilisation to society as a whole*. It is in these terms that the final section of this paper will examine public policy.
6. The arts of civilisation involve reflection, experimentation and the growth of knowledge. Human beings thereby produce or create themselves as a species (Bronowski, 1981).³ *In producing themselves however, human beings also produce the conditions of life for their fellow species*.

² Darwin was greatly influenced by Malthus, in describing the ‘struggle for existence’ that he saw in the wild, driving natural selection. The struggle for subsistence may similarly drive social interactions in the poorest human societies. More generally, however, it is hardly the case that entrepreneurs bestir themselves only when and if starvation threatens. Instead, it seems plausible to argue that it is the fear of loss of positional advantage and security that drives their incessant activity (Dopfer and Potts, 2008: para 4.2.1).

³ Bronowski elaborates this theme more than Darwin does himself. Notice how this view of the self-creation of the human species also resonates with Marx’s *Economic and Philosophic Manuscripts of 1844*, produced in the same year as Darwin’s first draft of *Origin of Species* (and, like that, unpublished at the time). Little wonder that Marx and his followers have been keen to see themselves as fellow travellers with Darwin, in revealing in what human distinctiveness consists (Avineri, 1968: Ch 3; Schmidt, 1971: Ch 1).

Anthropogenic change is now a major feature of the selective environment to which other species must adapt, in their own struggle for existence (Le Page, 2011).⁴

We now examine in more detail what it means to ‘reverse Darwin’s journey’, making artificial selection the vantage point from which we apply evolutionary models to technological and institutional change, but doing so with due regard for the complex interrelationships between artificial and natural selection that have just been outlined.⁵ We pose three questions in turn:

- How shall we conceive of human agents and their efforts to select from their institutional and technological legacy? How do they practice the discrimination that artificial selection involves?
- How do human agents, by re-weaving their technological and institutional legacy, probe and unlock the potentialities of their world?
- How shall we conceive of the ‘struggle for existence’ in which human actors are involved? How far does this involve a definition of fitness that still allows us to apply the insights of the evolutionary analogy?

In each case we then, like Veblen, consider what distinctive and critical vantage point this provides in relation to mainstream social science. By moving from artificial to natural selection, Darwin powerfully contested contemporary accounts of the natural order; we move from natural to artificial selection and critically contest prevailing accounts of the social order.

The paper turns finally to the arts of civilisation as expressed in public policies.

3 AGILE ACTION: SEEING WHAT IS NEW

Natural selection involves the transmission of genetic information between generations: information as to how organisms can successfully operate within different selective environments (Maynard Smith and Szathmary, 2000; Odling-Smee et al., 2003). There is therefore no need for each generation to discover this for itself. This information is tested and revised in each generation. It is populations that thus evolve: individual organisms do not.

In some species organisms are also able to obtain information from other individuals during their lifetimes. This is the case with humans in particular, where cultural products and processes allow shared learning and the ‘re-blending’ of that cultural inheritance by the young (Odling-Smee et al., 2003: 258-9). Again however it is by taking as their starting point the wisdom of the ancients – as embodied in the tools, habits and conventions that they have left - that the young are best placed to experiment and advance the knowledge base.

It is by reference to this starting point that humans practise the discrimination that is involved in artificial selection: the first of the questions posed at the end of the previous section. They assess situations using standard templates, by reference to which they can make routine responses. These are search strategies using ‘if-then’ algorithms as a cognitive shortcut. Loasby (1999: Chs 3,8) locates this within the exigencies of human evolution. Survival required that the brain should be able quickly to recognise predators and prey, not that it should make careful comparisons of the costs and benefits of different strategies.)

It is institutions and culture that carry these templates for survival (Douglas, 1986; Bowker and Star, 2002). There is therefore no need for each human to assess each situation by reference to the full range of possible behaviours (an immensely costly activity in terms of the energy and time involved). Instead, they can draw selectively from a shared inventory of templates and apply them to specific local situations. In general therefore the wisdom of the ancients is sufficient: in relation to the technologies and institutions people employ (Bronowski, 1981: Ch 2), the foods that they eat (Pollan, 2006: Ch 16), the ways that they die (Kellehear, 2007). This is a second cognitive shortcut.

⁴ We would be wrong to assume that anthropogenic change has become significant only in recent times. Flannery (1994) argues its major significance ever since the dawn of *homo sapiens*.

⁵ Hodgson rejects the attempt by some scholars to substitute artificial for natural selection when applying Darwinian evolution to social and economic change (Hodgson, 2002; Hodgson and Knudsen, 2010: Ch 3). It might seem therefore that his critique applies here. Nevertheless, the present paper is more nuanced, insisting that artificial and natural selection have to be understood by reference to their complex interrelationships.

In times of change, these cultural templates may not suffice. However, humans not only learn from the past, they can also imagine a range of possible futures. They bring with them more or less well-articulated mental models of how their world will unfold under conditions of uncertainty. This is a third cognitive shortcut. It allows humans to innovate and to imagine the larger consequences that their innovations may set in motion: and thus not only to survive, but also to seize and wager on opportunities for future advantage.

As well therefore as applying the wisdom and habits of the ancients, the arts of civilisation involve identifying emerging situations of threat and opportunity, where this wisdom must be re-worked for new circumstances. Indeed, it is precisely by applying the wisdom of the past that attention can be most effectively focussed on the challenge of whatever is new. Even if we blaze new pathways, we keep one foot on the safe ground we know, while with the other we test and try out the new possibilities. In doing so, we contribute to the growth of knowledge and of our own skills and capacities (Bronowski, 1981: Ch 3).

In his critique of Walrasian economics, Veblen challenged its focus on rational economic man, with roots in hedonistic psychology. This went hand in hand with market equilibrium, as its analytical centrepiece, with neither leaving any place for learning and the growth of knowledge, nor indeed for processes of endogenous historical development. Against this, Veblen offered a view of human activity that gave pride of place to habits and conventions: seen not as the refuge of the irrational and thoughtless, but rather as the embodiment of the wisdom of the past, by reference to which novelties and inventions could most efficiently be crafted, and duly selected in terms of their fitness or relevance to human purposes. It is this view of habits and conventions that Veblen rightly sees as central to a Darwinian evolutionary perspective on technological and institutional change.

In some degree echoing Veblen, we pause to consider how the notion of human action elaborated here relates to more general debates about social action. Much has been written in recent years about the merits of rational choice and rational action theory in sociology, political science and economics (Coleman, 1990; Goldthorpe, 2000: Ch 3; Hedström, 2005). Our own approach is more nuanced. Following what has been said above, we may see much social action as involving pattern recognition and responses that Weber (1949) would have described not so much as rational but as 'habitual', made by reference to an inventory of templates and 'rules of thumb', encoded within social institutions.

It does not follow that all action and interaction is habitual. Faced with novel situations, uncertainty and turbulence, human actors deploy mental models as to how the world will unfold. This we may describe as 'agile' action. Habitual action involves recognising a pattern and making a standard response. Agile action means re-working that pattern, having regard to conjectures as to how the world is likely to unfold. Between these two ideal types of action there is a dual connection. First, as we have seen, the cognitive economy in the former leaves maximum energy for the latter. Secondly, however, we must recognise that empirically, which matters are handled in which way is itself fluid. It is when actors detect anomalous patterns, including for example those that fall outside certain critical thresholds, that this alerts them to the need to make an agile response. These are typically situations that present opportunities or threats of major strategic significance. In short, what the if-then rules in this case prescribe is that the matter be removed from the if-then realm of the habitual. This is therefore an agenda forever in flux, and one which will vary greatly between actors, depending on their interests and the agility, resources and positional leverage of which they dispose. (For a somewhat parallel discussion, see Nelson and Winter (1982: Ch 5)).

This diverges from rational action theory, as normally articulated, in three respects. Rational action theory does not recognise the cognitive economies we have attributed to habitual action and the cultural wisdom those habits embody, freeing the energy and attention that can then be focussed on the challenge of the new. Nor therefore does it recognise the connections we have just indicated between habitual and agile action. Second, it typically views the social actor as confronted with a given menu of options, carrying particular costs, benefits and consequences. Here in contrast we highlight the agile actor who, rather than taking that menu as given, actively seeks to re-shape the rules of the institutional – and indeed the technological – landscape on which social interactions play out, precisely so as to change the options it offers (Dopfer and Potts, 2008: para 3.2.1). Third, rational action theory treats the social actor as existing in an essentially timeless environment. Here in contrast we highlight the wisdom of the ancients and the path dependency of the habits and conventions with which we are endowed; and the uncertainty of the future, in face of which

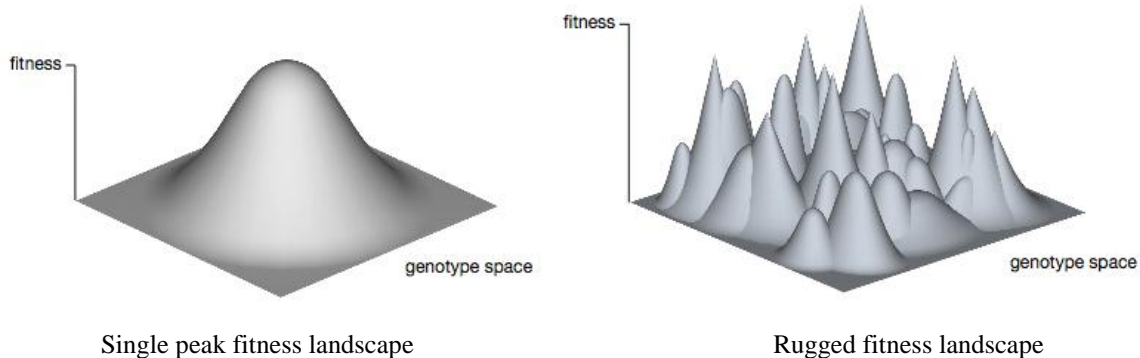
we can at best apply our mental models of how the world will develop, but always and irreducibly only as conjectures.⁶

Of course, we might decide to redefine rational action, so as to encompass this wider range of subjectively meaningful actions (Hedström, 2005: 62). It is after all ‘rational’ to be agile and to re-shape the menu whenever possible, so as to make it more attractive (and irrational to ignore such possibilities, merely adjusting to whatever menu results from the contests of others). It is also ‘rational’ to adopt wherever possible simple if-then rules of habit, so as to reduce the energy required by careful calculation. Goldthorpe for example offers a discussion of the evolution of human cognitive architecture similar to that which we have discussed in relation to Loasby, with its ‘simple, fast and frugal heuristics’; this however he continues to regard as being on a continuum with other forms of rationality (Goldthorpe, 2007: 180-181). Gilbert goes even further, seeing rational action as action according to any ‘reasonable set of rules’, as distinct from ‘acting randomly or irrationally’ (Gilbert, 2008: 1.3.5). Nevertheless, whatever terms are used, we must recognise this connected logic of habitual and agile action in an uncertain and shifting world, rather than just the rational assessment of benefits and costs in a static world.⁷

4 COMBINATORIAL CONTINGENCY: UNLOCKING POTENTIAL

We turn now to the second of the questions posed earlier in relation to ‘reversing Darwin’s journey’. How do human agents, by re-weaving their technological and institutional legacy, probe and unlock the potentialities of their society and their world? As in the previous section, we start with the Darwinian account of natural selection: from there we move back to the practices of active husbandry from which Darwin began.

Each generation of a population throws up new combinations of its genetic legacy. It is upon these variations that natural selection operates, allowing some to thrive more than others. Henceforth it is their genetic make-up that will be preponderant, within the species concerned. The direction of evolutionary development of a given species is however by no means random. The genetic legacy encodes past investments, which enable but also limit and channel subsequent development. History matters: evolution is path dependent (Shubin, 2008).



Evolutionary journeys can be visualised as an adaptive walk across a fitness landscape (Kauffman, 1993). By combining elements of its genetic legacy in new ways, a species shifts its genotype (its position horizontally within the diagram); it may thereby be able to increase its fitness, as measured by the height of the landscape. However, all species find themselves on landscapes that are more or less rugged, reflecting the afore-

⁶ It may be objected that rational action theory in at least some of its forms is far from ‘timeless’. ‘Rational expectations’ theory for example is centrally concerned with future events. Nevertheless, the whole basis of rational expectations theory – as applied to financial markets in particular - is that the probabilities of those future events can be calculated. Uncertainty (as distinct from risk) can therefore in principle be disregarded (Skidelsky, 2009: Ch 2).

⁷ This difference in ontology and focus goes wider than this of course. Thus for example debates over rational action and choice (including game theory) have given central attention to the conditions under which it may be rational for actors to cooperate or even to behave altruistically: see for example Axelrod (1984), Ball (2004) Chs 17-18. For us, it is certainly important to understand the conditions under which cooperation develops, rather than competition or conflict. Nevertheless, once we move from rational choices on relatively stable terrains to agile choices on turbulent terrains, it is the positional struggle that moves centre-stage. Competition and cooperation, solidaristic as distinct from individualistic advance, domination and adverse incorporation are contingent expressions of that struggle and must be understood in relation to it.

mentioned constraints and the path dependency of past development. There is therefore always the risk of getting caught on a low peak, unable to ascend further without costly descents into intervening valleys.

No species however makes its evolutionary journey in isolation. The fitness landscapes of different species are linked. They co-evolve. In some cases this is an antagonistic process, an 'arms race' between predator and prey species. In others it is a process of mutually beneficial adjustment, as for example between insects and flowering plants. The evolutionary journey of a given species, re-weaving its genetic legacy and unlocking its potentialities, is path dependent therefore by reference not only to that legacy, but also to the eco-systems of which it has become part. It is on the contingent combination of this dual legacy that natural selection acts.⁸

Such journeys of evolutionary biology are slow, blind and without overall intent. The evolving genotype is passive. In contrast, the artificial selection practised by Darwin and his neighbours was active, rapid and intentional. The notion of an adaptive journey is here more than just metaphor, whether applied to pigeons or to technological and institutional innovations. It is in these terms that we now consider how human agents, by re-weaving their technological and institutional legacy, can probe and unlock the potentialities of their society and their world.

The journey starts with novelty or variation: new combinations of the technological and institutional legacy. Among evolutionary economists, Potts (2000) adopts just such a combinatorial ontology, applied to technologies for purposes of production. A similar ontology is evident in Crouch (2005), applied to institutions. Both writers highlight the role of entrepreneurs – whether in the realm of production or institutional governance – who re-work these combinations and bring in new elements, so as better to achieve their purposes. Both of them also underline that in weaving these new combinations, entrepreneurs draw on the templates and practices of the past, but also deploy mental models of the uncertain future.⁹

Like the fitness landscapes of biological evolution and natural selection, technological and institutional innovation are strongly path dependent. Past investments build capacity, interests and power in ways that will facilitate some future journeys, while blocking others. Here however, in contrast to the evolutionary journeys of biology, human actors are forever on the lookout for opportunities deliberately to re-shape those constraints and path dependencies.

Entrepreneurs experiment with combinations – we might say 'ecologies' - of technologies and institutions. They try to avoid the 'evolutionary catastrophes' of a 'low peak', an evolutionary *cul de sac*, or a fruitless arms race. Instead they hope to discover new co-evolutionary dynamics that will produce 'runaway' improvements from relatively modest investments. Such dynamics may entail co-evolution between different technologies; between new technologies and new markets; between new forms of industrial organisation and new systems of public regulation, etc. Thus do humans seek to re-shape the contours of their fitness landscapes: exalting valleys, making the mountains low and the rough places plane. Whatever the mental models they deploy, however, both catastrophes and runaways may be difficult to spot until after the event.

To discover and nurture such dynamics is central to what we have called the arts of civilisation. It involves selective probing, trying out imaginative new combinations and discovering their potential, not randomly but by systematic testing and learning (Bronowski, 1981: Chs 2-4). It involves decomposing the world into those parts that will for the moment be taken as given, as against those that will be re-worked until their potential for runaway is exhausted. 'Exhaustion' here means not just that no further runaway is available; but also that the co-evolutionary dynamics that have produced these runaway improvements are routinised into standard operating procedures, habits, conventions. They are now, in other words, part of the stock of traditional templates, well-honed tools and skills on which later-comers can draw.

This now provides a new vantage point – a new point of leverage - from which other components of the world can similarly be investigated. Nothing in our technological and institutional legacy is incontestable: nevertheless, the adaptive journey requires that we always keep one foot on solid and well-tried ground, even

⁸ The classic discussion of contingency in evolution is Gould (1991: Chs IV-V).

⁹ Meanwhile these mental models themselves evolve, in the sense that they are themselves subject to innovation and selective adaptation by the population of entrepreneurs. This is creativity as a collective cultural process; and here again there is path dependency. See for example Beinhocker's (2007: Ch 15) discussion of business plans.

as the other tests out the new.¹⁰ Again however the sequence of these steps – and of the arenas chosen for selective probing - is fateful for future directions of travel.

Darwin often repeats: '*Natura non facit saltum*' (nature makes no leaps). The adaptive walk of the evolutionary journey involves a succession of small-scale variations that slowly explore the contours of the fitness landscape, avoiding the risks involved in long-distance change. Nevertheless, as Darwin's successors have recognised, small steps can lead to discontinuous change, in the form of 'punctuated equilibria', with periods of stasis followed by larger-scale cascades of reconfiguration (Gould and Eldridge, 1977). In the social and economic world, the runaway changes to which we have referred can also have this character, with sudden cultural shifts and tipping points dramatically transforming the landscape. We may keep one foot on solid and well-tried ground: but in testing out the new, we may find that ground suddenly changing beneath our feet.

In the previous section, the arts of civilisation were discussed in terms of the relationship between habitual and agile action. Here we have discussed them in terms of the search for connections and co-evolutions that will yield runaway change. The art here consists in recognising these potential dynamics and making appropriate connections within a complex contingent structure.

If the arts of civilisation involve the exploration, development and testing of a complex contingent landscape, this takes us far from the notion of market equilibrium, the centrepiece of Walrasian economics and the target for Veblen's critique. As in the previous section, we finish by noticing some connections with more general debates in social science.

First, equilibrium analysis posits a system of variables and interrelationships, set in a larger context or environment, taken as 'given'. Negative feedback ensures stability when the system is disturbed. Competitive markets ensure the prevalence of such effects. Empirically however it is evident that positive feedback often predominates (Arthur et al., 1997). Social and economic activities fatefully sculpt the surrounding context in ways that can be self-reinforcing. These are processes of 'cumulative causation' and they make for an 'economics without equilibrium' (Kaldor, 1985; Toner, 1999). They arise not least because the social and economic actors in question actively seek them. This was of course central to the foregoing account of the quest for 'runaway' change.

Second, we follow Dawe (1970) in noticing two contrasting perspectives in social science. One highlights the 'problem of order' and sees individuals as simply adjusting to the changing social structures and circumstances in which they find themselves. This perspective resonates well with the equilibrium concerns of Walrasian economics. The other highlights the 'problem of control' and emancipation. It brings individual definitions of the situation centre-stage; as also therefore the contesting of such definitions, the strategies of action they inform and the social interactions – cooperative, competitive, conflictual – which ensue. Social systems here appear not as the locus of order but as the emergent outcome – to some extent unanticipated – of social interactions among a myriad individuals. If this is order, it is so because some social actors have succeeded in negotiating or imposing that order on others, shaping the terms on which for example, the economy 'self-organises', or different communities are empowered. This is however always provisional and contingent, in face of the ever-renewed struggle for control.

Finally, we have argued that what matters is the sequence in which combinations and connections are made and co-evolutions are set in motion - all serving to unlock potential or close it down, creating critical junctures, thresholds and tipping points. In like manner, Harré would have us think of causal processes as releasing or blocking potentialities (Harré, 1972, pp 121-2). Causal chains are also however of political concern. They are constructed institutionally and historically. If they are complex and contingent, subject to cascades of reconfiguration, this is because they are forever being contested and re-shaped, in the struggle for positional advantage. Harré's account of potentialities, critical thresholds and novel dynamics, can be read as much as an account of this historical and political struggle as a contribution to the philosophy of science.¹¹

¹⁰ This too therefore is an if-then search of the sort discussed earlier. If the arena chosen for selective probing offers scope for runaway advances, they should be pursued; when however such advance falls below some threshold level, the entrepreneur turns to other arenas, using the new leverage and vantage point gained.

¹¹ Marris (1996: Ch 7) offers a similar account of power as 'the mastery of contingencies rather than the accumulation of assets'. He emphasises that at every level this typically involves the progressive displacement of the burden of uncertainty onto those who are weaker.

5 THE POSITIONAL STRUGGLE

We turn now to the third of the questions posed earlier in relation to ‘reversing Darwin’s journey’. How shall we conceive of the ‘struggle for existence’ in which human actors are involved? How far does this involve a definition of fitness that still allows us to apply the insights of the evolutionary analogy? We again start with the Darwinian account of natural selection, returning from there to the practices of active husbandry.

Natural selection is selection by population dynamics. It is those ‘variations’ that thrive and reproduce most vigorously that are progressively better-represented in successive generations. It is thus that they reveal – to us as intelligent observers - their superior ‘fitness’. This is, of course, fitness in relation to the particular environment that the population in question occupies (both the physical environment and the encompassing eco-system). Locally isolated populations in different environments will therefore select according to different criteria of fitness and they will progressively differentiate themselves into distinct sub-species (Darwin’s finches in the Galapagos being the classic example).

Darwinian evolution is a blind process. Artificial selection in contrast is a deliberate human activity. Fitness is here something that human innovators attempt to judge *ex ante*, rather than just waiting for it to be revealed *ex post*.

What however do we mean by ‘fitness’ in the context of artificial selection? In agriculture, we might refer to hardier strains of wheat, for example, that can thrive in colder climes or are more resistant to natural predators. As in the case of natural selection, it is if these strains survive and thrive with greater success that they demonstrate their superior fitness. Only the source of the variation differs. Rather different is the case of the pigeon bred for its speed of flight or elegance or the apple for its taste: here it is the delight of the breeder or the customer that dictates which varieties of pigeons and apples will thrive. The customer is now the most important component of the selective environment.

Different again is the technological novelty that the entrepreneur brings to market. Here are no natural predators: the selection process is entirely within the market place of human consumers and their desires. Here however it is insufficient to assert that customer delight in different technological novelties – like customer delight in different apples – will dictate which varieties predominate. Technological novelties not only delight customers’ hedonistic impulses, they also enable them to develop new systems of production and profit, to explore new runaways, to extend their power and their positional advantage.

As argued previously, this pursuit of positional advantage is even more evident when we turn from technologies to the evolution of institutions. New institutional forms bring new lines of differentiation in the population, consolidating the positions of some while excluding others, or else incorporating them – locking them in - on adverse terms. Instead therefore of blind population dynamics selecting by reference to the ‘fitness’ of different variations, powerful actors here actively shape technological and institutional change, as they struggle for positional advantage within that population.¹²

How then shall we think of ‘positional advantage’ within a population, driving artificial selection no less than the ‘fitness’ that drives natural selection?

Already in the previous section we saw that the entrepreneur is forever weaving new combinations of technologies and institutions, in hope of discovering co-evolutionary dynamics that will yield runaway improvements in position. This search – embodying as it does processes of reflection, learning and intentionality – is oriented to an uncertain future. It deploys mental models of how the changing world is liable to unfold. These models are however varied and provisional: different entrepreneurs are therefore likely to make different judgements of the future positional advantage that particular investments will bring.

Positional advantage can mean scope for profit-taking by bringing scarce and valued novelties to market. It can mean rent-taking by placing institutional restrictions on access to markets by competitors. It can involve ‘first mover’ privileges: the opportunity to have first shot at investigating and benefitting from new runaways (albeit this can be so risky that it is sometimes better to be second mover). It can mean privileged access to

¹² The theory of group-level or multi-level selection has in recent years become fashionable in evolutionary social science (Boyd and Richerson, 2002; Bowles, 2003; D Sloan Wilson, 2008). The shift in vantage point adopted in this paper, centred on artificial selection, also gives a key place to group selection: but in terms of the struggle for positional advantage through new lines of institutional differentiation in the population, consolidating some groups and incorporating others on adverse terms. Rather than blind population selection by reference to the ‘fitness’ of different groups, this is now a matter of differential power: a concept that has had little or no place within evolutionary social science, but is central once we ‘reverse Darwin’s journey’.

processes of life chance distribution, by institutional arrangements that incorporate other population groups only on adverse terms. It can mean offloading the costs of uncertainty onto others. Above all however, it means a protected and privileged vantage point within an uncertain future.

As in previous sections, our discussion of positional advantage and the arts of civilisation permits some comment on larger debates in social science, concerned with positional struggle. Hirsch (1977) for example provides a simple but influential account of positional goods and the 'positional economy'. The distribution of its fruits – unlike those of the 'material economy' – is a zero-sum game. In some degree at least, educational credentials have this character. Hirsch sought clear principles – not just in theoretical terms but as a matter of practical politics – as the distributional basis for such positional goods, so as to avoid a self-defeating competition.

Other writers go beyond Hirsch, highlighting the ever-intensifying character of this positional struggle. First mover advantage allows actors to block developments they oppose; to build resilience; to maintain their own freedom of manoeuvre, keeping others guessing as to what they will do next; to offload uncertainty onto others and to destabilise them so that they cannot mount a challenge (Marris, 1996; Pierson, 2004). The struggle for positional leverage is therefore *a struggle to occupy the future*: come what may, tomorrow is likely to turn out well for the protagonists in question, allowing them to weave their own futures, rather than being obliged to move to the rhythms of others (Abbott, 2001: 247). This is why, as Keynes for example observes, the accumulation of wealth is often not so much for eventual consumption, it is for some indefinitely distant date, to ensure a place in the sun, whatever the future disposition of the world (Tily, 2007: 142).

We return finally to Veblen. In the essay which provided our starting point, Veblen may not explicitly examine the pursuit of positional advantage, still less does he examine how this sits within an evolutionary perspective on economic development. Nevertheless, in other of his writings that theme moves centre-stage. In particular, Veblen provides a scathing account of the super-rich of his day, the 'leisure class' (Veblen, 1899). Their conspicuous consumption advertises their positional advantage, reinforces their social and economic distance from the larger society and provides ever-renewed symbols of the good life, to which that larger society is enjoined to aspire. This critique is echoed by James Galbraith (2009: Chs 7,9), the most prominent contemporary exponent of this robust tradition. He describes the modern-day counterpart to the leisure class as 'predatory': a new class of oligarchs devoted to rapacious looting (see also Akerlof and Romer, 1993).

When we described the positional struggle which artificial selection entails, we touched both on technological novelties, whetting the delights of customers but also enabling them to build new systems of production and profit, and on processes of institutional differentiation, by which the positional advantage of some is reinforced, while others are incorporated on adverse terms. It is in these terms that Galbraith depicts the current economic order and, more particularly, the financial crisis of recent years. On the one hand, new financial products and services were invented to cater for the different expectations, time horizons and risk stances of different market actors. Nevertheless, what is also well-documented is that some of these new instruments were designed to evade the regulators (notably their rules on the capital base that banks must maintain on their lending) and by their complexity to conceal the riskiness of the assets which they represent (notably in the case of sub-prime lending) (Soros, 2008: Ch 4; Brummer, 2009; Tett, 2009: Ch 2). At the same time the development of these instruments permitted predation on the major institutions of society – corporations, banks, housing finance, education and health, pensions – for purposes of private gain at public expense. The result has been adverse incorporation and looting of the most vulnerable.

6 POLICY SCIENCE AND THE EVOLUTIONARY LEGACY

Veblen's essay of 1898 provided our point of departure. There Veblen argued that economics *should* be an evolutionary science; but that it had not developed at such, and was therefore not fit for purpose. We now pose a parallel question: 'What sort of policy science is implied by this evolutionary legacy?' The answer is two-fold.

First, we share Veblen's doubts about 'equilibrium' and 'rational action' as the taken-for-granted heart of economics, or indeed any social science. Instead, and again like Veblen, we find in evolutionary science a more appropriate analytical inspiration, which brings learning and the growth of knowledge centre-stage. We have however insisted that in applying evolutionary ideas to the social world, it is necessary to 'reverse Darwin's journey' and take artificial rather than natural selection as the analytical starting point.

Nevertheless, as we saw in section 2, the practise of artificial selection can hardly be entirely separate from the wild. A new variety of plant developed by the horticulturalist will succumb to the competitive pressures of natural selection, unless it is kept in a wholly artificial environment. The entrepreneur who develops new technologies or institutions is likewise at the mercy of blind population dynamics across the wider society, as different population groups adopt and adapt – or else ignore – the novelties he or she has brought forth, and connect – or fail to connect – them with other technologies and institutions. Artificial selection – agile, reflective and in some degree equipped with foresight – re-weaves the genetic and cultural legacy, only for this to be further re-woven in a myriad struggles without any overall intent. The arts of civilisation, unless forever renewed, are forever at risk of being overwhelmed by the wild, whether biotic or social.

In human affairs, the wild is shaped in particular by the powerful and the predatory. Fundamental choices of public policy and purpose are therefore posed, as to the directions of change that citizens and policy makers wish to cultivate, modifying the interests and power that dominate the positional struggle. This is husbandry of the social fabric, applying the arts of civilisation to society as a whole. It is in these terms that we now examine public policy.

This brings us to a second answer to the question: ‘What sort of policy science is implied by this evolutionary legacy?’ It is an answer that is most obviously illustrated by reference to *social* policy. Maybe it is first necessary to consider what we mean by social policy. As an academic field, it lacks the simple clarity of the Walrasian tradition in economics. In terms of methods and paradigms, its exponents are rather promiscuous: as ready to deploy the legacy of Walras as that of Veblen. What they have in common however – and perhaps this is all – is their concern *to analyse and evaluate the economy by reference to social goals such as equity and cohesion, defined politically for the society as a whole*: in other words, by reference to an overall normative and political intent. Already this challenges Walras, who presents the economy as an equilibrium which neither needs nor can admit any social challenge. However, it also challenges any evolutionary perspective on economy and society that imports from Darwin’s account of natural selection the assumption of blind and unintended order or ‘self-organisation’. It asserts instead that social progress is indeed possible: albeit progress defined within the particular historical circumstances of the academic and political actors concerned and therefore forever open to critical review and redefinition.

Social policy – as an academic discipline and as a form of political practice – applies the arts of civilisation to society as a whole. Just as the pigeon breeder or horticulturalist seeks to ‘improve on nature’ in regards to the latest generation of offspring and have it accord more fully with human purposes, social policy as political practice properly seeks to modify the positional struggles unfolding across economy and society, so that they accord more fully with whatever social goals the practitioner in question posits. Social policy as an academic discipline must equip political actors to reflect on those processes and civilise their consequences.

This then raises questions about economic policy also. We may of course conceive of economic policy as simply lubricating the Walrasian market, so that it can more readily attain its ‘natural equilibrium’. Or in a watered-down form of Keynesianism, economic policy may be seen as simply managing the aggregate level of demand, so as to maintain full employment, leaving the market system otherwise to find its own equilibrium state. Or in the Schumpeterian tradition, economic policy-makers may be expected to stimulate entrepreneurial creativity and to guarantee property rights, but otherwise not to interfere in the economy’s self-organising propensities (Parker and Stacey, 1994; Dopfer and Potts, 2008).

Against this however we may insist that economic policy, like social policy, is properly concerned with social goals such as equity and cohesion. Both social and economic policy – and indeed environmental and many other areas of public policy - are part of our endeavour to civilise the wild, bridling predation and barbarism. Civility does not ‘self-organise’; it must be politically constructed; and we cannot escape the social and political choices of our time.

Even this however is not the end of the matter. Social policy may be part of our endeavour to civilise the wild; it is however still organised largely at the level of the nation state. It defines the institutional boundaries of citizenship, excluding outsiders or incorporating them on adverse terms. Moreover, by building loyalty and cooperation, risk sharing and collective action, it is an instrument in the positional struggle between nations, mobilising populations for economic and political competition (Titmuss, 1963; Room, 2004). This is as likely to fragment as to foster global civility. Whether, as a species, we are the capable of pooling the arts of civilisation, in a *globally* shared endeavour, remains to be demonstrated.

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