Unsurprised by surprises: education for survival in uncertain times.

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Introduction

This paper draws together two strands of recent work in the philosophy of education as this relates to the interaction of societies with their environments and, in particular, the conceptualisation and management of natural resources. One strand elaborates the implications of a semiotic theory of learning (Stables, 2005; 2006; 2008). The other draws upon economic thinking, and has a particular focus on the parameters of human decision-making over time (Gough, 2008, 2009; Scott and Gough, 2003).

These strands draw on quite divergent influences, but nevertheless converge around a set of issues linking learning to questions of the sustainability and security of liberal societies (Gough and Stables, 2008). The paper explores the commonalities that underlie this convergence, and the implications it has for educational practice. Commonalities between the two strands of thought include:

- A realist ontology compatible with the broadly Darwinian, pragmatic philosophical perspective of Rorty (1999) and Dewey (1910). A detailed account of such an ontological position has been developed by Hodgson (2002; 2004; 2006), who notes an unfortunate but widespread tendency for Darwinian perspectives to be (often aggressively) excluded from the projects of the social sciences. Following Hodgson, the paper accepts that this arises from the historical misrepresentation and misunderstanding of Darwin by some who have used his name to justify their actions and beliefs. The central, minimal point for our argument is that issues of human survival and security cannot credibly be conceived as being without connection to the material universe. Therefore, since that universe is governed by Darwinian principles, a theoretical linkage of Darwinism to social scientific understandings is simply indispensible.
- A semiotic epistemology (Stables, 2005) within which human survival is taken to depend upon a continuous process of meaning-making that is not determined by physical resource limits, but is ultimately constrained by these. On such a semiotic account, 'meaning-making' is not to be conceived of as merely mental response to, and interpretation of physical events, but is constitutive of all forms of adaptation and progression. (See, for example, Peirce, 1931-5, 1958; Deely, 1990).
- A logically consequent distinction between the finitude of natural resources, which is inescapable, and conceptions of their fixity. This is to say that, while there can be no doubt that the resources available to humans are ultimately limited, our present conceptions of where those limits lie may be expected to undergo modification (for better or worse) over time. This point is perhaps most notably illustrated by the sequence of events since the publication of *The Limits to Growth* (Meadows *et al*., 1972), which predicted the extinction of resources that have, in fact, become more plentiful. They are not, nevertheless, infinite. More subtly, the point is also illustrated by underlying conceptual divergences between the natural sciences, which have on the whole retained an essentially Mathusian perspective, and economics, which, for the most part, long since abandoned it (Norgaard, 1984). The central point here is that while what exists in nature is finite, what counts as a 'resource' depends entirely on what people want to do, and what technologies are available to them in trying to do it. To anticipate a further stage in the argument, we might also note here

that what people want to do *next* will depend very much both on what they can do *now*, and what happens when they do it.

- A recognition that the distinction between economy (or 'the economic'), and environment (or 'the environmental') is analytically redundant in approaching contemporary crises of the security and sustainability of human life. We might illustrate this by reference to the popular conceptualisation of 'sustainable development' as the intersection of the three 'sets' of 'environment', 'economy' and 'society'. This description is popular because it is useful (Scott and Gough, 2003). It conveys the fact that, whatever sustainable development may be, it includes elements from all three domains. But so does every other aspect of our lives. There is no society without an economy, and no social action that does not have economic implications, at least in terms of opportunity cost. Every economic act acquires its meaning through society, and has implications in the environment. This is as true of on-line trading in arcane financial derivatives as it is of, say, open-cast mining. It may be argued, of course, that one can have an environment without either a society or an economy – but no one is talking about the need to conserve *any* environment. Human concerns are for *the* environment; the one that social and economic activities have filled – and continue to fill - with (often varied, often contested) meanings. The implications of this for our thinking about learning, sustainability and security are developed below.
- A view of the role of education, broadly defined, as including the preparation of learners to respond effectively, adaptively, and in collaboration with others, to the surprises and novelties (whatever form they may take) that they will certainly encounter in life. This view is not unsympathetic to the notion of 'lifelong learning' in at least some of its manifestations, but goes beyond these in two important ways. Firstly, it insists that both social and biogeophysical change are inescapably both contingent and continuous in nature. There is no end state to be reached, no golden age to return to. As Isaiah Berlin (2002) points out, even our most dearly-held values must be expected to change over time, though we should hold them no less dear for that. Secondly, it identifies semiotic engagement as our only means, at any given moment, of coming to terms with such change.

Towards a non-dualist realist ontology

People inhabit an environment which, while unknowable directly as *noumena*, is perceived and understood as *phenomena* as a system of signs, in relation to which the brute physical is, in John Deely's term, 'prejacent' (cf. Von Uexkull's conception of the *Umwelt*: Deely, 1990). They may flourish, or they may struggle to survive, but in either case they will interact with their environment using tools to do so, simultaneously modifying both it, as *Umwelt*, and themselves, as sign-users. Their tools may take many forms, for example: chisels, axes, paintbrushes, semi-automatic weapons, conversations, emails or institutional strategy documents. As Richard Rorty (1999) has pointed out, this engagement of the individual with her environment through the use of tools constitutes a Darwinian encounter, the outcomes of which over time depend on the operation of variety and selection. It is an engagement with reality. Being 'out-of-touch with reality' is, in this sense, simply not possible.

These points are philosophically important because they constitute a necessary corollary of a wider insight of philosophical pragmatism: that the Cartesian

mind/body dualism, that is still so influential in the social sciences, is both unhelpful and unfounded. On a strict substance dualist account, Darwinianism itself can be understood as construing 'reality' as brute mechanical physicality, devoid of mind or intention. By overcoming this dualism, a fully semiotic account effectively removes this objection to Darwinism. This being so, conceptions of human agency as being, for example, rooted in an innate preference for maximal utility, give way to an account in which such agency is seen as an emerging property of existing propensities to act, within unfolding and never-fully-predictable contexts. Thus it becomes possible to reconcile the inescapable logic of a real world (understood as) composed of atoms and governed by natural laws, with the active intellect and purposeful decision-making displayed by individuals as they respond to the signs and signals that represent their environment. Further, we would argue, it implies a role for education, not simply as the delivery of information to those who will use it (though this is not to deny that information is important), but as an expertly-negotiated process for the development of the learner. As John Dewey (1990/1902: 65) put it:

> From the side of the child, it is a question of seeing how his experience already contains within itself elements – facts and truths – of just the same sort as those entering into the formulated study; and, what is of more importance, of how it contains within itself the attitudes, the motives and the interests which have operated in developing and organizing the subject-matter to the plane it now occupies. From the side of the studies, it is a question of interpreting them as the outgrowth of forces operating in the child's life, and in discovering the steps that intervene between the child's present experience and their richer maturity.

Hodgson (2002, 2004, 2006), whose work is located at the intersection of the traditions of pragmatic philosophy and institutional economics, elucidates the relationship, within a Darwinian framework, between the domain of the natural sciences and that of the social sciences. This, he argues, requires the adoption of a notion of 'emergent properties' at a number of different, layered ontological levels from the atomic to the social. Hence, reductionism is banished since, for example, while an individual's behaviour is dependent upon her physiobiochemical composition, it cannot be explained solely in terms of this. Rather, the person is a complex system exhibiting system-level properties that are additional to, and not predictable from, the sum of the properties of the lower level components. Similarly, social institutions may be expected to possess emergent properties that depend upon, but cannot be reduced to, the characteristics of the individuals that make them up. This raises the crucially important and extremely controversial question of the possibility and nature of 'downward causation', that is, the determination of lower-level phenomena by higher-level processes.

'Upward causation' is not controversial. For example, patterns of individual sickness, migration, laziness, thrift, fecundity or carbon-emission impact upon social institutions. Downward causation, however, not only excludes reductionism, because wholes can no longer be explained entirely in terms of their given constituent parts, but also, contrariwise, opens a door to forms of 'methodological collectivism' that seek to explain all individual behaviour in terms of system-level influences and, at least sometimes, invite a totalising tendency. This is not the place to review the historical twists and turns of these debates. Suffice it say that we find Hodgson (2006)

persuasive when he concludes in favour of two related principles. These are: firstly, that social scientific theory is not reducible to biology (or, even, physics), but it must be consistent with it; and, secondly, that higher-level causal processes do not alter those at lower levels (at least, not immediately or directly), but work through them. Methodological collectivism is to be rejected, therefore, because individuals cannot be brought to behave in particular ways simply by means of their inclusion within particular social institutions. Rather, those institutions have influence through their effects on individual understandings, dispositions, attitudes, preferences and/or limitations – and each of these involves the operation of a phenomenally independent intellect (which is also, in turn, an emergence from a lower ontological level). We should note that this proposition is: (i) consistent with the view of education proposed above; (ii) absolutely distinct from anything that might be termed indoctrination; and, (iii) an impossible nonsense from a reductionist perspective or, indeed, from that of neoclassical economics.

The notion of variety is important to this discussion because the contexts of human action vary in their unique complexity, and so do individual responses to them. Everything has a cause, and so there are no miraculous events (Hodgson, 2004), but causality may well be far too complex to be fully apprehended by any individual. (Thus to Peirce, for example, while cause and effect are ubiquitous, even natural laws may be subject to change.) This means that a key philosophical innovation of Darwinism is that it places variety at the heart of its ontology. Hodgson (2006, 32-33) puts it as follows:

> Before Darwin, a Platonic and Aristotelian 'typological essentialism' prevailed, where species are defined in terms of a few distinct characteristics that establish their essence. All variations around the ideal type are regarded as accidental aberrations. Marx clearly was an Aristotelian in this respect … In contrast … For Darwin, the essence of any type included its potential to exhibit or create variation … Summarizing a complex system in terms of average or representative components neglects the variety that is essential to system behaviour and evolution.

We may now return to the possibility – raised above, and dismissed by Rorty – of being 'out of touch with reality'. In the context of human security, sustainability and survival, what are we to make of the climate-change campaigner who argues that oil-guzzling SUV drivers are out of touch with reality; or suicide bombers who make the same claim about the country they were born in? We would argue that there are two broad possibilities here. Firstly, different people may make sense of uncertainty in dramatically different ways (Thompson, 1997; Scott and Gough, 2003). They may experience and interpret their own social/environmental contexts in such a fashion as to generate heterogeneous, internally but not externally consistent, oppositional conceptions of 'reality'. In Rorty's terms, therefore, they are not out of touch at all. The second possibility is quite different. It is that events at a higher ontological level are overtaken by those at a lower one. For example, the disappearance of the Greenland Norse in the fifteenth century was ultimately caused by a slow process of global cooling (Diamond, 2005; Gough, 2008). A response of heightened religious observance during this period was still, in Rorty's terms, an act of engagement with the real, lived environment on a day-to-day basis. In longer term retrospect, however, it may be judged to have been the exact opposite, as even the possibility of religious

observance was negated by catastrophic events. Where this leaves us with respect to the SUV driver and the environmentalist, or the peaceful patriot and the terrorist, we are not yet in any position to say. Suffice to assume that each is not only enacting and embodying a subjective response to objective reality, but is playing his or her small part in modifying it.

Finally, much importance has been attached to Darwinian principles in the foregoing, and we are aware that many social theorists regard any Darwinian influence in the social realm with deep suspicion. This is not the place to set out the many misrepresentations of Darwin's work that may bear on this view, and anyway this has already been done (Hodgson, 2004). Suffice to say that Darwinism as here understood does not: equate evolution with 'progress'; endorse racism, sexism, imperialism or the triumph of might over right; banish altruistic or collaborative behaviour; or, (as should be clear from the foregoing) explain human intellect and purposefulness in purely genetic or biological terms.

Economy and environment

In everyday contemporary discourse, at every level from the local to the global, it is normal, firstly, to make a working distinction between the economy and the environment and, secondly, to assume that the interrelationship between these two entities is typically in the form of a trade-off. This separation is reflected throughout our institutions, as is the relative importance attached, on the whole, to its separated elements. So, for example, almost anywhere in the world (perhaps not on low-lying Pacific islands!), we find greater resources and prestige attached to finance ministries as compared to environment ministries: and, at the international level, the World Trade Organization, International Monetary Fund and World Bank are (in this sense) one thing, and the United Nations Environment Programme quite another.

In the spirit of this paper we should say that there is nothing inherently stupid, or even wrong, about such a distinction. In the lives of Londoners who live in the flight path of Heathrow's proposed third runway, or rainforest peoples facing displacement by the expansion of logging and/or mining activities, it is a perfectly valid, useful way of making sense of the world. However, it is an equally valid and useful perspective for those who would like to see the runway built or the forest logged because they and their children might hope to benefit, in one way or another, from the resulting additional business activity. To separate economy and environment may help individuals to fashion powerful reasons and arguments to achieve important goals in the here-and-now: but it does not help us towards a collectively better understanding. This matters educationally, because 'better understanding' is an educational value. It matters in terms of human survival if it is indeed the case that, at this point in our history, there exists a threat from events at a lower ontological level, such as that which eradicated the Greenland Norse. Such a threat might arise in contemporary times from climate change, biodiversity loss, a combination of these, or, indeed, some cause that cannot at present be imagined. It might manifest itself directly through environmental catastrophes of one sort or another; or, through secondary effects such as conflicts over disputed rights to environmental assets such as water, oil, and agricultural land; or, over financial claims to such assets and their expected products, in the present or the future. Or, perhaps, none of these things will happen. In seeking to reunite economy and environment within a framework of the philosophy of education, an educational justification is sufficient. However, we would argue that

anyone worried about potential insecurities arising from either ‘environmental’ or ‘economic’ causes should probably take note.

A conceptual device capable of uniting thinking about economy and environment is that of ‘co-evolution’ (Norgaard, 1984; 1994; Lele and Norgaard, 1995; Kerry Turner, 1993), which has been developed over many years by Richard Norgaard and others with that express intention. The core proposition of co-evolutionary theory is that social action (whether individual or institutional) is capable in causing modifications to the environment over time which then, in turn, promote further individual and social responses. We should note at once that, as it is stated here, there is absolutely nothing in this proposition to suggest that such a process of iterative, mutual adaptation will necessarily be progressive, beneficial, or, from any particular standpoint, morally desirable. A simple example would be an initial adoption of agricultural practices in a society leading to: the generation of local food surpluses; increases in population through increased fecundity and reduced mortality; and, subsequent outward migration and the domestication of further tracts of land. As written this sounds all very well, but seems less so if we introduce the complication that the ‘extra tracts of land’ already provide subsistence for a community of nomads. Outcomes will then depend on the choices made on both sides, and these will arise from the interplay of the existing dispositions of individuals as these find specific expression within a context of social institutions (including, but not exclusively, educational ones). However, even if those dispositions and institutions are predominantly scientific in nature, choices will always be made in a context of uncertainty since neither ecosystem responses to socio-economic action, nor socio-economic responses to ecosystem change, can ever be fully predictable across all social, temporal and geographic scales. This is not to say that scientific knowledge is irrelevant, or that scientific investigation of the issues is pointless: quite the reverse. But it is to say that incompleteness of scientific knowledge, and resulting uncertainty, are to be expected.

Such a view is entirely consistent with the notion of ‘layered ontologies’ described earlier. The actions of social institutions do not modify the environment by changing scientific laws. They work through such laws by altering the circumstances in which they operate, and by attributing meaning to change processes and their outcomes. It is for this reason that social change may often proceed at a much faster rate than environmental change. Individuals and (some at least would argue) institutions can learn. They can imitate, reject, experiment and abandon. They can imagine, believe and suppose. In short, and as we have already noted, they can fashion multiple certainties out of uncertainty, but they are vulnerable to unforeseen, and unforeseeable surprises.

A co-evolutionary account is also consistent with the finitude/fixity distinction developed earlier, since - from an exclusively human viewpoint only - it permits the possibility of negative entropy. This is not to question the laws of thermodynamics. Indeed, it is fundamental to the case we are making that those laws cannot be questioned. Rather, it is to point out that, over spans of time which are vast from a human perspective but geophysically negligible, the ordering of nature can change in ways that happen to be beneficial (or, at least, suggestive) to the human species at a particular point in its development . The formation of hydrocarbons is perhaps the

most obvious example. Hence, the question ‘what resources are there?’ is not at all the same as the question ‘what exists?’

In summary, the notion of co-evolution provides an analytic device for considering the holistic interactions of society, economy and environment, that does not depend upon the separation of these elements into separate analytical spheres. Usefully, it does so without prohibiting the use of the words ‘society’, ‘economy’ and ‘environment’, since these are our shared linguistic currency. Co-evolutionary thinking accommodates both physical laws and human meaning-making, attaching importance to both. It reveals the potential of learning, but also delineates its scope, so that “the immense task of influencing co-evolution to our benefit” (Norgaard, 1984, 532) is, as an educational goal, at once as potentially liberating as it is challenging and vital. Finally, it clarifies widespread and entrenched confusion about what environment actually is.

As we have seen, the word environment can be taken to refer to the ‘natural environment’, defined in some way that takes as its focus enduring natural processes and laws. It may also be thought of in personal terms, as the total array of signs and signals confronting a particular human organism. Or, we might propose some sort of halfway house that, for example, takes account of the built environment but excludes social artefacts such as traditional and religious symbols or beliefs. In fact, each of these conceptions represents a level within a layered, mutually-influencing totality. Persons engage with their environment through the use of tools. Economic behaviour is one form of such engagement. Engagement involves response to particular signs and signals that depend on, but are not reducible to, natural processes and laws. Such responses entail agency and deliberation, but are also always consistent with (but not reducible to) scientific laws. Responses may be mediated through social institutions. Agency may result in both the modification of the material conditions of life, and/or the generation of new signs and symbols. Finally, we should note that there are issues of both geographical and temporal scale. For example, a collective decision to adopt new agricultural practices may set in train a long term process of soil salination that has implications for future generations far beyond the immediate area, while at the same time provoking an almost immediate spike in the share prices of firms manufacturing agricultural machinery.

The role of education

This paper began with a commitment to a realist, non-dualist ontology for which the crucial identifying characteristic of any category or classification is not its essence but its ability to generate variety. Thinking about education in these terms would lead us to reject the following approach:

> To define education we must, then, consider educational systems, present and past, put them together, and abstract the characteristics which are common to them. These characteristics will constitute the definition we seek.
> (Émile Durkheim, 2006, 78)

In such a view, we begin our educational endeavour with a stipulative definition of what it is that we are about, and this is derived from the identification of commonalities across other endeavours in the same category at the social system level.

Douglass North (1994, 362/2004, 415) offers a more promising formulation, in which both variety, and the semiotic engagement of the individual with her environment, are strongly implicit:

> Learning entails developing a structure by which to interpret the varied signals received by the senses … The structures consist of categories – classifications that gradually evolve from our earliest childhood to organize our perceptions and keep track of our memory and analytic results and experiences.

In these terms, and with regard to the wider arguments of the paper, one might propose a conception of education as a systematic attempt to engage the agency of learners, for the purpose of ongoing deliberate review and refinement of their own interpretive structures, through consideration of the interpretive structures of others.

It should be said at once that, as written, this proposition is broadly consistent with a fairly wide range of philosophical perspectives that suggest possible purposes for education. Examples include the following:

- Amartya Sen's (2002) notion of individual 'metarankings' - that is, preferences about what it is better to prefer - and his linkage of the personal development of preferences to the foundations of rationality and freedom.
- Jürgen Habermas's (2003, 33) conceptualisation of moral behaviour as: "a constructive response to the dependencies rooted in the incompleteness of our organic makeup and in the persistent frailty … of our bodily existence."
- Friedrich Hayek's (1960, 81) claim that: "in discovering the best use of our abilities we are all entrepreneurs."
- The view advanced by John White (2007) when he argues that the notion of 'wellbeing' cannot be understood solely in naturalistic terms. Rather, it is dependent on culture and cultural processes. To insist that any viable conception of wellbeing must be minimally consistent with the laws of biology in no way detracts from this proposition.
- Ian Westbury's (1999, 361) view of the essential role of the curriculum leader in promoting "an expansive conception of education", while at the same time recognising that the curriculum is: "the public organizational form that, to be legitimate, must instantiate the aspirations of all of the constituencies of the school."

However, the discussion acquires a fresh edge in the light of: our incorporation of the environmental with the social and economic; our focus on security, sustainability and survival; and, our insistence of the inevitability of uncertainty and surprise. What can or should education have to offer in response to threats from global terrorism, climate change, contested migration and pandemic disease? Is a focus on learners' own development of their 'interpretive structures' good enough under these circumstances? In answering this question it is instructive to consider to contrasting wider forms of response that are currently much in evidence. Although they are contrasting, they are not fully incompatible, and it is not difficult to find individuals and institutions advocating elements of both.

The first involves a retreat into self-sufficiency and isolation. At an interpersonal level we should shop locally, grow our own vegetables, reduce our carbon footprints, develop a sense of community, and report unattended luggage: at a national level we should reduce food-miles, support domestic industry, treasure shared values (one of which might be a commitment to tolerate diverse values) and reduce dependency on transnational pipelines and the mineral riches of contested foreign deserts. Many instances of these kinds of behaviours may have individual merit, but at an aggregated, totalising scale this is an approach that finds itself at odds with the immutable characteristics of lower ontological levels. Quite simply, there is ultimately no security in self-sufficiency because it is massively inefficient. It does not offer the possibility of survival for anything approaching the present human population, or, in rich countries, at anything like the present quality of life. Further, this is an approach that yields freedom from fear on very questionable terms. That freedom is earned simply by curtailing our desires, an approach of a kind described in general terms by Isaiah Berlin (2002, 186) as a "form of the doctrine of sour grapes".

A second kind of response is to make survival the highest value of all. If it is believed to be at stake, then searches may be conducted, roads sealed off, personal information accessed, rights suspended and collateral damage accepted. As with the first kind of response, there may be individual instances of all these things that seem only sensible: but in the aggregate, or as a universal rule-of-thumb, this approach, like the first, defeats its own object. This is because the aspiration for survival goes beyond (though it includes) the mere aspiration to continue breathing. It extends to a desire for freedom and justice (however conceived, and among other things), and these are progressively undermined by each instance of suspended rights or collateral damage.

We might summarise the argument of this section as follows:

- Issues of human survival are usefully conceived in terms of the variety they generate, rather than common or typical characteristics they exhibit.
- Individual responses to issues of survival that are appropriate at particular places and times may be unsuitable for generalisation or aggregation.
- The meaning of 'survival' is a composite of elements from both lower ontological levels (for example, the requirement to continue breathing), and higher ones (for example, a desire for freedom and justice).

It is admitted that 'education that helps learners develop their interpretive structures' makes a poor slogan when compared with 'self-sufficiency' or 'search and destroy'. However, it has the merit of accommodating the need (sometimes) for both, and being a slave to neither.

Conclusion

It might be objected that the foregoing amounts, in the end, to little more than blind faith in the emergence of spontaneous order, with education as its midwife: help people realise what they really want to do, equip them with the tools to do it, and everything will turn out for the best. Given that our focus is nothing less that human survival, such unconsidered faith would be rash. As Hodgson (2004, 435) puts it:

> While self-organization and spontaneous orders are important and widespread in both nature and society, they rely on specific types of incentive alignment that ensure that most individuals have no reason to deviate from or disrupt the

> emergent order. Other payoff structures exist that may not lead to optimal or satisfactory outcomes, and additional factors may be necessary to reach a satisfactory result.

'Additional factors' mentioned by Hodgson include enforcement, and the temporary imposition of suitable arrangements as a means of modifying preferences over time.

The arguments of this paper are consistent with those of Hodgson to the extent that they recognise both the importance of spontaneous order and its possible limitations. However, they go beyond his analysis in proposing that what counts as an 'incentive', a 'payoff', a 'satisfactory outcome', an acceptable 'additional factor' or, ultimately, 'order', can only ever be contingent, and can only be arrived at through the interpretation of currently-received signs and signals. Therefore, each of these terms itself admits of variety. Education's role is to ensure that variety is productive, with regard to both the biological fact of survival, and what it means to survive.

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