

Price Evolutionary Methods

Organizational Darwinism and Research Methodology

Abstract

I argue that research methodologies in organizational studies provide an example of cultural evolution but that the resulting dominant logic impedes understanding by militating against realistic inductive research. I examine major 'schools' in organizational Darwinism / cultural evolution and identify overlap between those who use evolutionary dynamics as a relativist lens, the more classically positivist thinking derived from Evolutionary Economics and Darwin's original (1871) conceptual or constructive cultural evolution I then take Darwin's inductive assembly of facts and test existing research that has used an evolutionary perspective against the various strands of his "one long argument"

Key words

Organizational Darwinism, Cultural Evolution, Organizational Ecology, Memes

WHEN on board H.M.S. 'Beagle,' as naturalist, I was much struck with certain facts in the distribution of the inhabitants of South America, and in the geological relations of the present to the past inhabitants of that continent. These facts seemed to me to throw some light on the origin of species—that mystery of mysteries, as it has been called by one of our greatest philosophers. On my return home, it occurred to me, in 1837, that something might perhaps be made out on this question by patiently accumulating and reflecting on all sorts of facts which could possibly have any bearing on it. (Darwin, 1859 1)

Introduction

My impression, supported by a recent helpful compilation by Abatecola of references since 2009¹, is that the general field of organizational Darwinism is devoting itself more to theoretical discussion and less to patient accumulation of and reflection on facts. I wonder if the pressures of the modern academy, driven by research evaluations (Renwick, Breslin and Price in prep.) contribute. I also wonder if the hegemony of methodology in organizational studies may contribute. This paper sets out to explore especially the latter question but also its converse. How is Organizational Darwinism [OD] positioned against the landscape of research methodologies? How should it be?

The paper pursues the inquiry in two ways. It starts by looking at the current diversity of research methods in organizational studies and the critics of same. We ask whether such diversity, and the current demands of methodological orthodoxy, constitute a potential example of conceptual evolution in action. Switching perspectives the paper then examines OD against current research methodology and attempts to 'map' different perspectives. Finally it goes back to *The Origin* and examines OD's arguments against the range of 'fact types' accumulated by Darwin. The resulting observations begin an argument for inductive but empirical research capable of yielding realistic evidence.

¹ Seminar to Sheffield Business School Organizational Ecology Interest Group November 6 2012

Contemporary methods through an evolutionary lens

I am sorry to keep pestering you but I've been reading more into research philosophies and I think I understand my position now but I keep wasting time going round in circles so I just would like to see if it makes sense?

To lapse into rhetorical questioning - a warning, according to Dennett (2003) of a weak argument - who has not received inquiries along those lines from a student exposed to a research methods module? Price (2012a) concluded a manuscript with the sentence "Methods from the historical and biological sciences can open new means of researching organizations as ecologies of narratives." Two anonymous reviewers asked that the point be expanded. At the time there was insufficient word-count to attempt the task but the meme (sensu Dennett op cit) planted itself in my mind.

Conceptual evolutionists in the tradition of Kuhn (1962), Toulmin (1972), Waddington (1977), Hull (1988), Distin (2005, 2010), Weeks and Galunic (2003), Price (1995, 1999, 2012b) see communities of thought whether designated as organizations or not as enabled by 'conventional wisdoms'^{2,3}. A less evolutionary minded tradition in organizational studies argues a similar case for mental models / dominant logics / sub-cultures / ideas that are embedded in historical dynamics and are usually interpreted via the lens of power structures (e.g. O Mahoney 2012). It seems to me, and it lay behind the remark at the start of the paper, that one such dominant logic is the conventional research methods wisdom [CRW⁴] that we embed in virtually all business and management courses.

Critics may scream at the claim of a single CRW. Rhetorical question again. Are not pages and journals and a lucrative textbook genre dedicated to exploring the subtle distinctions

² Waddington's term. Others have used paradigms, mental models, representations, modes of thought and discourses

³ Darwin (1871) anticipated the point and social construction (Price 2012b)

⁴ Exapting Waddington's (1977) memorable metaphoric acronym could one call it CROWDUNG? It is after all dropped from on high.

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between, and within, individual methodological stances? Of course they are. CRW is arguably a relatively high level clade: a proposition testable in theory by methods similar to those applied by Lord and Price (2001) to post-reformation religions or the organizational cladistics of McCarthy et al. (e.g. 1997) or Baldwin et al (e.g. 2013). Indeed a short Google images search revealed a proto phylogeny at a professional essay writing site⁵ (Figure 1). Those who attempt to market to the academic process understand its mores.

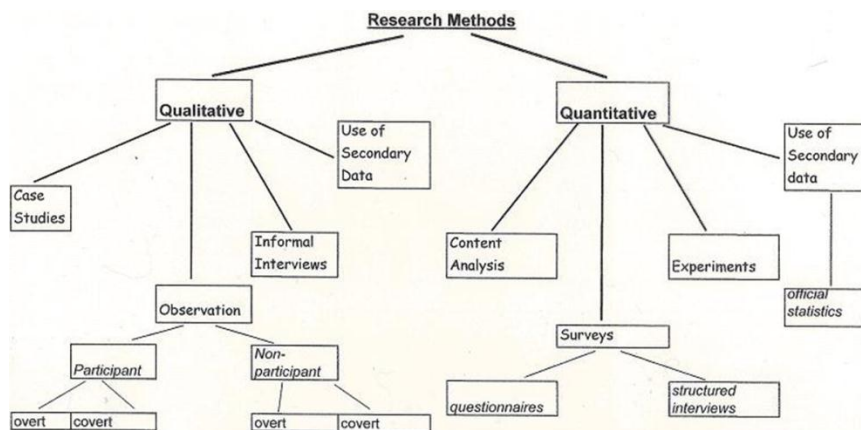


Figure 1 A crude taxonomy of research methods illustrating how they might be conceived as a clade

Even at doctoral *viva voce* level today's students are expected to nail their colours to particular ontological, epistemological and for good measure often axiological masts. In simple terms quantitative research is equated with positivism, the methods of the natural sciences and a hypothetico-deductive methodology. Qualitative research is interpretive and, in the main, relativist. More than 40 years ago one of the defining texts of the CRW movement (Morgan and Smircich, 1980: 491) described the qualitative/quantitative categorisation as "a somewhat crude and oversimplified dichotomization" but it has not only persisted but also strengthened. As Wood and Welch (2010) have remarked Morgan and Smircich's five dimensions across 6 categories from subjectivist to objectivist actually yield

⁵ <http://www.professays.com/wp-content/uploads/2009/12/Data-Analysis-Methodology.jpg> accessed on 29 October 2013.

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7776 (6⁵) potential research types⁶. The following quotation, extracted from a discussion organised by the UK's Higher Education Academy⁷, could describe the various camps of taxonomic scholarship identified by Hull (1988)

However, the problems I will give most attention to arise from current conditions. One is the deep methodological divisions now to be found among social researchers, not just quantitative versus qualitative but also within each of those camps. These sometimes extend beyond differences in view about how to pursue research to disagreement about its goal and value. This 'internal' problem blends into an 'external' one: that the task of research methods teaching is no longer seen as enabling students to understand, and in some cases to carry out, academic research. It is also expected to prepare students for a range of occupational destinations to which 'research skills' might be relevant. There are also external problems generated by the increasingly bureaucratized organization of research, including ethical regulation. The result of all these problems is not just that it is now very difficult to teach social research methods well, but that there is actually little agreement about what this would mean – even as regards what is to be taught.

One could analyse the situation in Toulminian terms (Renwick et al. op. cit.) and question whether each methodology, ethnography say or structural equation modelling, is a selfish signifier (Price, 2012a) competing for space in the resource niche of higher education. By means of books, courses and academic societies the CRW clade and its sub clades exert all three of DiMaggio and Powell's (1983) isomorphic pressures to institutionalization. The *coercive* influence of quality procedures demands that the perceived orthodoxy is maintained via the validation process. The *mimetic*⁸ affect reduces pressure of preparation and the *normative* influence is exerted via the journals one writes for and reads, and the research groups one maintains membership of.

The CRW has its critics. As well as those mentioned one could also point to the movement for mixed methods (e.g. Johnson & Onwuegbuzie, 2003; Morgan, D. L., 2007; Feilzer 2010;

⁶ Readers familiar with Dennet's (1995) libraries of Mendel and Borges might see these as points in the possibility space of methodologies; a library of Morgan perhaps. Some might of course be untenable in practice

⁷ <http://blogs.heacademy.ac.uk/social-sciences/2012/09/10/teaching-research-methods/> accessed on 29 October 2013

⁸ Imitation. DiMaggio and Powell did not quite reach memes.

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Cairns, 2012). That is not my concern here. I worry about some of the premises that have built themselves into the current CRW.

Notwithstanding critical realism, students frequently feel that their desire to do qualitative studies implies they have a subjectivist stance. It is not just students. Recently the editor of a highly ranked international journal in its field declined to consider a submitted paper because it claimed to describe a realist ethnographic study and he had been taught that as such it was a contradiction in terms⁹. There is no such bias in the early organizational writing on ethnography with for example Sanday (1979, 529) writing that:

If, after having completed the ethnography, the observer can communicate the rules for proper and predictable conduct as judged by the people studied, he or she has produced a successful product. The ethnographer is like the linguist who has studied and recorded a foreign language so that others can learn the rules for producing intelligible speech in that language.

Sanday's paper comes from a special issue of another highly ranked journal, *Administrative Science Quarterly*, arguing the merits of the qualitative perspectives as it was then appearing in organizational studies from, on the one hand, anthropology (e.g. Sanday, op cit; Mintzberg, 1979) and, on the other, literary theory (e.g Manning, 1979 see also van Maanen, 1979). Nowhere in those papers can I find any contention that the research described is not realist or indeed useful in the sense of surfacing insights capable of informing managerial and policy decisions. Mintzberg (583) expresses the point well:

The field of organization theory has, I believe, paid dearly for the obsession with rigor in the choice of methodology. Too many of the results have been significant only in the statistical sense of the word. In our work, we have always found that simpler, more direct methodologies have yielded more useful results.

He also points at least a finger at the problem:

⁹ The Journal concerned had published recent papers arguing the need for qualitative research in operations management. The paper was subsequently accepted in a journal devoted to organizational ethnography (Suckley, Price and Sharpe, 2013). An operations management reviewer judged that it addressed a key gap in the field.

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*Our doctoral students get a dose of Popper (1968) in their research methodology course. Popper bypasses induction as not part of the logic of scientific inquiry, and the students emerge from the course -like many elsewhere -believing that somehow induction is not a valid part of science. I stand with Selye (1964) in concluding that, while **deduction** certainly is a part of science, it is the less interesting, less challenging part. It is discovery that attracts me to this business, not the checking out of what we think we already know. [584 original emphasis]*

The conflation of positivism with the methods of the natural sciences in the CRW still owes much, and is even founded on, a reading of the works of Sir Karl Popper. His "critical rationalism" is interpreted as a rejection of empiricism, and the classical observationalist-inductivist account of science that had grown out of it. Less widely acknowledged seems to be the derivation of critical rationalism as a critique of Marxism or that Popper finally acknowledged¹⁰:

that it is impossible to discriminate science from non-science on the basis of the falsifiability of the scientific statements alone; he recognizes that scientific theories are predictive, and consequently prohibitive, only when taken in conjunction with auxiliary hypotheses, and he also recognizes that readjustment or modification of the latter is an integral part of scientific practice.

Here we reach the earlier point about the historical and biological sciences. Geology is, in the main inductive even if plate tectonics and the K/T impact theory have yielded predictions that are arguably falsifiable¹¹. Darwin saw himself at least as much as a geologist as a naturalist (Figure 2) and his "patient accumulation of facts" was surely inductive even if the subsequent genetic revolution has added a huge deductive dimension¹². In lumping positivism with all natural science, we make a categorical error as illustrated in Figure 3. The range of natural science extends from the empirical and inductive to the purely deductive logic of mathematics.

¹⁰ <http://plato.stanford.edu/entries/popper/> Accessed 19 December 2013 and Popper (1979)

¹¹ Notwithstanding J.B.S. Haldane's supposed comment about fossil rabbits in the Precambrian. The remark may be a modern 'urban legend' among popular science writers.

¹² With current developments in epigenetics and the sensitivity of genetic expression to context (e.g. Carey, 2011) demolishing the simplistic gene as instruction metaphor that predominates when DNA is invoked as a metaphor in social science

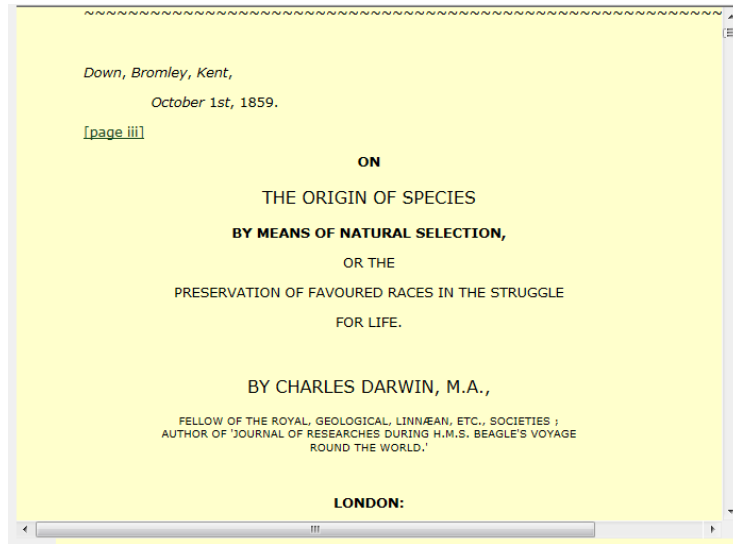


Figure 2 Title page from *The Origin of Species*. Note the membership of the Geological Society

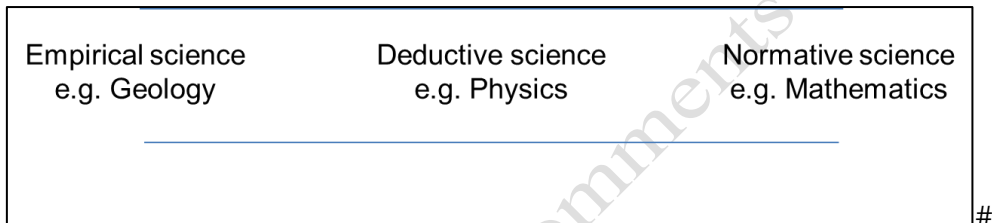


Figure 3 The range of approaches in the natural sciences from the largely empirical to the purely normative

As Alvesson and Sköldbberg (2009 22) recently put it:

Many difficulties of the social sciences appear to be caused by importing a positivist view of how science 'should' be practised, a view that in its turn has been based on an erroneous picture of how natural sciences really work.

Organizational Darwinism, at least in some of its schools, is surely an ontologically real proposition concerning organizations and their environment. It is already a sufficient challenge to the CRW with many social scientists, even if they use such terms as evolution reluctant to mention the D-word (Hodgson, 2013) let alone the M-word (Distin 2010) Perhaps we need, as we take the subject forward, to not only avoid the CRW but to extend the challenges to it such as those identified so far.

Organizational Darwinism through a CRW lens

Increasingly, the rational strategies of planned-innovation and long-range planning are being undermined by unpredictable changes.

That quotation, modern as it sounds dates by more than 50 years (Terreberry, 1968 595). Its author was arguing for the increased turbulence in inter-organizational evolution driving a need for adaptability as "a function of ability to learn and to perform according to changes in the environment" (ibid 590). Her point might now be seen as a call for the evolution of evolvability (c.f. Price, 1995; Price and Shaw, 1998). It is at best a moot point whether the diversification but also fragmentation in the evolution of CRW clades has granted insights into the realisation of such adaptability. The methods texts might construct the 'science' (c.f. Schwartz-Shea and Yanow, 2002)

As noted, for example, by Breslin (2011 233)

What becomes apparent in a review of the Generalized Darwinist approach to studying socio-economic change is the lack of consensus regarding the detailed mechanisms of variation, selection and retention, and in particular the definitions of the replicator–interactor.

One school, predominantly represented in recent Italian writing (reviewed by Abatecola, 2014) has used evolution and evolutionary dynamics as a relativist lens or image (c.f. Morgan, 1986) through which to view organizations. A second, coming from a more positivist perspective has built the case for organizations as interactors and 'routines' as interactors (e.g. Aldrich et al., 2008; Murmann, 2013; Dollimore, 2013 and reference therein). A third claims organizations are better understood as ecologies within which "modes of thought" compete to be replicated via their access to a share of an organizations resource (Price, 1999; Weeks and Galunic, 2003; Alexander and Price, 2012). Confusingly both groups have styled themselves as examining organizational ecologies; an example perhaps of the term as a selfish signifier (Price, 2012a, 2012b)

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By way of an experiment, taking the remark (Wood and Welch, 2010) that Morgan and Smircich's (1980) five dimensions from subjectivist to objectivist actually yield 7776 potential research types I began to map individual positions onto 'the Library of Morgan' (Figure 4) by asking individual researchers to plot their understanding of the scope of organizational evolution

Table 1
Network of Basic Assumptions Characterizing
The Subjective—Objective Debate within Social Science

	Subjectivist Approaches to Social Science				Objectivist Approaches to Social Science	
Core Ontological Assumptions	reality as a projection of human imagination	reality as a social construction	reality as a realm of symbolic discourse	reality as a contextual field of information	reality as a concrete process	reality as a concrete structure
Assumptions About Human Nature	man as pure spirit, consciousness, being	man as a social constructor, the symbol creator	man as an actor, the symbol user	man as an information processor	man as an adaptor	man as a responder
Basic Epistemological Stance	to obtain phenomenological insight, revelation	to understand how social reality is created	to understand patterns of symbolic discourse	to map contexts	to study systems, process, change	to construct a positivist science
Some Favored Metaphors	transcendental	language game, accomplishment, text	theater, culture	cybernetic	organism	machine
Research Methods	exploration of pure subjectivity	hermeneutics	symbolic analysis	contextual analysis of Gestalten	historical analysis	lab experiments, surveys

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Figure 4 Individual interpretations by 3 OE researchers of the scope of OE research

There are obvious and immediate limitations to the exercise. Only 3 views are represented without a contribution from the mainstream evolutionary economists - who one might anticipate as falling closer to the objectivist end of the spectrum. There was no attempt to test different individuals' interpretations of the same phrase. By way of example the trope "reality as a social construction" might be interpreted differently by, on the one hand, a subjectivist and, on the other, a conceptual evolutionist advancing the view that representations / memes expressed through language is a real, 'objective' phenomenon.

Nonetheless the map begins to suggest a domain for OD studies that does not fall neatly into the rather more fixed camps that have evolved in the 30 plus years since the basic diagram was constructed. It is possible to adopt a realist position to the study of social construction

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and symbolic discourse. 'Man'¹³ can be studied, objectively, as a symbol user and social constructor (Darwin, 1871; Distin 2010; Price, 1999, 2012b). The process offers insights into change and adaptability. Hodgson and Knudsen (2010 24) have criticised conceptual evolution for failing to engage with mainstream social theory:

Many of even the most sophisticated attempts to apply Darwinism to cultural evolution—regard ideas as the units of selection at the cultural level. Cultural evolution reduces to the selection sets of ideas, beliefs, or preferences on a single level. Little connection is made to the vast literature in social theory on social structures, roles, positions, and institutions. These are reducible neither to individuals nor to their ideas.

One could accept the argument but argue the selection of "ideas, beliefs and preferences" (linguistic representations or constructs) as the ultimate explanation for the proximal study of "social structures, roles, positions, and institutions". Are the latter phenomena the emergent products of the former process? Could an objectivist inquiry deepen the understanding of the social phenomena?

Darwin as Inductive

The theory of cultural evolution contends that the changes and developments in all areas of human culture can truly be said to evolve: that they, just as much as the changes and developments in nature, can be described by an evolutionary algorithm; and that a convincing theory of cultural evolution can play the same unifying role across the social, psychological and behavioural sciences as evolutionary theory has played in biology. (Distin 2010 4)

Testing such claims, within what might be called mainstream organizational research requires an acceptance, or re-acceptance, that inductive methods can yield realist insights. Without intending a pun geology could be thought of, and was traditionally taught, as if it was rooted in grounded inquiry¹⁴. Facts were patiently assembled, albeit frequently interpreted through existing - and limited - constructions. How well does organizational Darwinism, generalised Darwinism or cultural evolution stack up against Darwin's assembled facts, or indeed later

¹³ To use with caution the now politically less acceptable text of the original diagram.

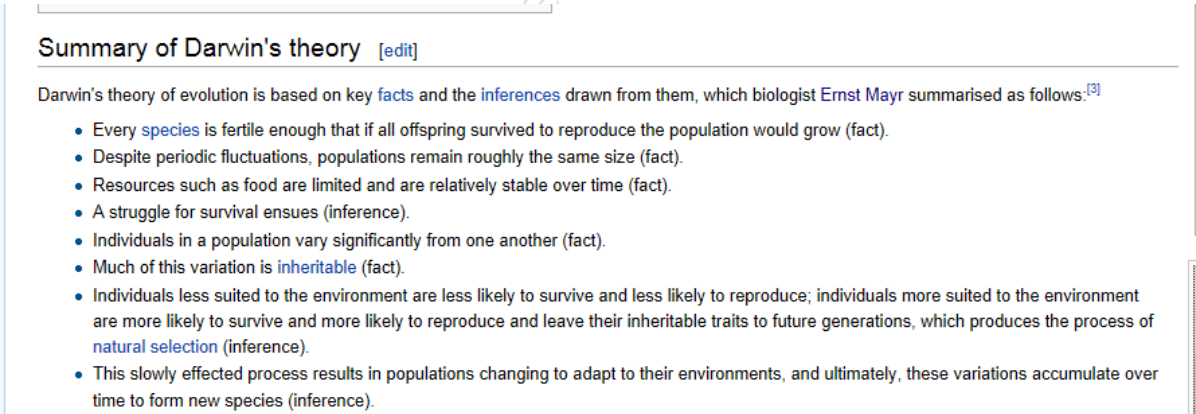
¹⁴ And the original grounded theory of Glazer and Strauss (1967) did not separate the inductive and the deductive nor the qualitative from the quantitative. Their "rhetoric wars" developed as Straussian GT became more fully aligned with the qualitative clade in the CRW.

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confirmatory evidence? The question is similar to that asked by Mesoudi, Whiten and Laland (2004) whose review argued that evidential studies, primarily but not exclusively anthropological, showed evidence of variation, competition, inheritance, accumulation of modifications, adaptation, geographical distribution, convergent evolution and change of function¹⁵. They found, in empirical work that was not always explicitly evolutionary, comparisons with "the disparate sources of evidence" that were "instrumental to Darwin's argument" (ibid. 2). We repeat such a search, framing it by reference to two philosophical reviews of Darwin's theorising (Mayr, 1991; Ruse, 1986)

Mayr (1991)

Ernst Mayr is widely recognised as one of the foremost, almost recent expositors of Darwin's thinking taking his 1991 title, *One Long Argument*, directly from *The Origin*. It is hard to beat Wikipedia's summary of that argument (Figure 5). How much of it can we discern in the various theories of organizational evolution?



The image shows a screenshot of the Wikipedia article titled "Summary of Darwin's theory" with an [edit] link. The text states: "Darwin's theory of evolution is based on key facts and the inferences drawn from them, which biologist Ernst Mayr summarised as follows:[3]". Below this, there is a bulleted list of seven points:

- Every species is fertile enough that if all offspring survived to reproduce the population would grow (fact).
- Despite periodic fluctuations, populations remain roughly the same size (fact).
- Resources such as food are limited and are relatively stable over time (fact).
- A struggle for survival ensues (inference).
- Individuals in a population vary significantly from one another (fact).
- Much of this variation is inheritable (fact).
- Individuals less suited to the environment are less likely to survive and less likely to reproduce; individuals more suited to the environment are more likely to survive and more likely to reproduce and leave their inheritable traits to future generations, which produces the process of natural selection (inference).
- This slowly effected process results in populations changing to adapt to their environments, and ultimately, these variations accumulate over time to form new species (inference).

Figure 5 The Wikipedia summary of the One Long Argument

For Mayr, Darwin's recognition of species as a population rather than as expressions of some ideal, Platonic archetype was crucial to his recognition that variation between members of a species was both natural and a precondition of evolution. It is the differential survival of

¹⁵ i.e. exaptation

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members of a species that drives evolution. OD theory does not seem to have fully expressed the equivalent.

For analogists the question does not arise, or at least not with the same force. For population ecologists such as Aldrich whose equivalent proposition might be more firms are started (born) than can survive the start-up the new firms themselves are equivalent to members of a species. The economic species, if it is to be found, is at the level of an industry or perhaps a particular organizational type. The population of surviving firms becomes the species equivalent. That said, the school has been criticised for adopting an overly typological rather than a truly population approach (Reydon and Scholz, 2009; Dollimore, 2013). As the latter put it (ibid 26):

Thus, in addition to the exploration of "vital rates" (i.e., births, deaths, exits), attempts should be made by researchers to gather data at the organizational level. Attempts should be made, for example, to identify the characteristics in individual firms that contribute to fitness in the population under study and assess the relative importance of these as selection criteria. Attention should be paid to the nature and quality of the firm's routines; to their emergence, stabilization, and disruption; and to their effects on the organization's development and growth.

In conceptual evolution the closest Darwinian equivalent might be Toulmin's (1972) scholars struggling with each other to progress to positions of power within a discipline. Groups of like-minded individuals are a natural by-product (Hull, 1988). As Distin (2010 211) remarks "academia provides many examples of ... cultural isolation". Some branches of research methodology say might be considered sufficiently distinct to be considered a species, and some of its varieties have arguably evolved to the point where they find intercourse across variety boundaries, unproductive at least and often impossible¹⁶. The populations of methodological scholars who survive in the environment of particular academic institutions

¹⁶ The comparison with the reproductive definition of a biological species does not escape me. Indeed the taxonomy illustrated in Figure 1 has some of the properties of a ring species. See for example http://evolution.berkeley.edu/evolibrary/article/devitt_01 (accessed 25 March 2014)

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become the species equivalents. Indeed the whole discipline of research methodology could provide an empirical test.

The production of ideas and terms is not difficult to conceive. It is their survival which matters. As Mayr also put it:

"natural selection is really a two step process, the first one consisting of the production of genetically different individuals (variation), while the survival and reproductive success of these individuals is determined in the second step, the actual selection process." (op cit. 68)

It is in some ways easier to conceive of the production of individuals with different ideas than of firms with different routines. Conversely it is easier to examine the survival and economic (reproductive?) success of firms but less easy to conceive heritable variations. In the words of a recent review:

Although so far there is no consensus on what social replicators or interactors are, three of us have argued that business firms are examples of social interactors, and individual habits and organizational routines qualify as replicators (Aldrich and Ruef 2006; Hodgson and Knudsen 2004b, 2006b, 2008). Other Darwinian theorists consider individuals or groups as interactors, and ideas as social or cultural replicators (Hull 1988; Mokyr 2006). These debates remain important among proponents of a generalized Darwinism. (Aldrich et al. 2008 587)

The same review argues for biological species as one example of the general class of 'complex population systems' and raises the possibility of more than one 'social replicator'. It ignores the evidence from supposedly relativist research that 'ideas', 'habits' and indeed the unwritten rules that pervade organizations are ultimately linguistic constructs or representations (Price and Shaw, 1998; Price, 1999, 2012b).

Perhaps also the search for a species equivalent is misguided. Species as conventionally understood are a property of the eukaryotic, multicellular, domain and the concept does not easily or even necessarily transfer to prokaryotes (especially eubacteria and archea) or viruses (Distin, 2010 Ch. 13 and references therein) and modern genetics is showing the same 'genes' (i.e. DNA Sequences) can make different contributions both within and between eukaryotic species.

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Ruse (1986)

Michael Ruse, another Darwinian philosopher, has pointed out how *The Origin* addresses a consilience of facts concerning not only the development of morphological features such as limbs or eyes but also instincts, palaeontology, geographic distribution, embryology, and systematics. Can we find an equivalent consilience in organizational / cultural evolutionary theory: an explanation for a range of observed facts?

Instincts. Darwin devoted a whole chapter (7) to instincts, broadly behaviours that did not have to be learnt, through which members of individual species interacted with aspects of their environment. He included what we would now call pleiotropy, for example the instinctive docility shown by domesticated animal strains. To a modern reader it resembles a prelude to the extended phenotype (Dawkins, 1983). Can we discern equivalents in organizations?

Language for Darwin (1871 74) was not a true instinct. It had to be learned, but “man has an instinctive tendency to speak, as we see in the babble of our young children; whilst no child has an instinctive tendency to brew, bake, or write.” Many others have made similar points in philosophy (e.g. Habermas, 1975, 1995 Winograd and Flores, 1986) and cognitive science / evolutionary linguistics (e.g. reviews by Christensen and Kirby, 2003; Distin, 2010) but realist as opposed to relativist studies of language constructs in organizations are harder to locate. Ford’s (1999) perspective on organizational change as shifting conversations (c.f. Price and Shaw, 1998) has not really entered the mainstream change management literature (judged from Boje, Burnes and Hassard, 2012), Should we be asking if the wealth of research and commentary on narratives, stories, metaphors and metaconversations (e.g. Robichaud Giroux and Taylor, 2004) are saying something real? Language may be not only a co-ordinating mechanism (Health and Siedel, 2005) but a shaping one. Chen’s (2013) identification of apparent correlations between Future-Time Reference and socioeconomic

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behaviours is generating critical debate but might point to a direction for more comparative research.

Palaeontology. (Chs 9 and 10) Despite modern discoveries of intermediate forms such as in the hominoidea or early ancestors of whales the absence of intermediate forms still represents a challenge: one that creationists remain eager to exploit. The fossil record shows an overall development compatible with modern molecular genetic evidence. It displays a limited number of major transitions (Lane, 2009) and on shorter timescale long periods of stability with shorter (geologically speaking) transitions, the punctuated equilibrium as opposed to phyletic gradualism of Eldredge and Gould (1972). Mesoudi, Whiten and Laland (2004) were careful to provide examples of technological artefacts - the case of steam engines - and complex symbol systems¹⁷ wherein intermediate steps in were discernible in the development of complex cultural items. In contrast Rothschild (1992) argued that the Watts steam engine was slow to displace the older Newcomen design in areas where the latter was established. New organic species arise in peripheral isolates rather than by the gradual change of an entire population. The historical dynamics of artefactual evolution and organizational change, or the lack of it, might provide one of the strongest arguments for OD and cultural evolution in general (Gersick, 1991; Price, 1995; Price and Shaw, 1998). Organizational crises, and their potential to disrupt strategic stability have also been convincingly drawn on, albeit as analogies, by the Italian school of OE (Abatecola, 2012, 2013, 2014)

Examples of exaptations, shifts in the function of a trait during evolution, offer a second rhythm derived partly from palaeontology, have also been provided by the same school (Abatecola, 2012). In the late 1980s and early 1990s various versions of 'Business Process' were current in the popular management literature. Business Process Re-engineering survived

¹⁷ Their examples involved numerical notation and calculation; an example of what Distin (2010) has termed artefactual languages

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as the dominant term for the new fashion Review, Simplification, Management, Innovation, Improvement, Control, Transformation were all contemporary suffixes. Each arguably described attempts to exapt operational management practices developed in manufacturing environments to services and the 'white-collar' aspects of corporations. Benchmarking, another popular fashion of the period, exapted a term from surveying to a completely new usage. On a wider scale if cultural evolution took off when one species, ours, developed a unique blend of vocal and manual dexterity then culture can be considered an exaptation (Christiansen and Kirby, 2003; Distin, 2010¹⁸)

The Business Process examples illustrate a third dynamic from biological evolution with parallels in the cultural domain. When new niches open up, whether after a mass extinction or when parent species from a nearby mainland reach an offshore island, records show evolutionary radiations, as with the mammalian faunas after the final extinction of the dinosaurs or the famous Galapagos finches. The economic and technological changes of the late 80s / early 90s arguably opened a new niche for Business Process memes (Price and Shaw, 1998; O'Mahoney, 2007). Price (2012a) discusses other examples.

Geographic distribution. The topic merited two chapters (11 and 12) in *The Origin*. The Galapagos finches and tortoises provide but two examples of localised species. This example and others form the facts of Chapter 12. Less widely appreciated are Darwin's macroscopic facts; his observations on different responses to similar environments on different continents reported in Chapter 11. Subsequent studies, such as the marsupial fauna of Australia mimicking placental niches elsewhere, the ecological diversity of Madagascar, or the developing match of eukaryotic clades to previous continental assemblies (all discussed by Dawkins 2004) provide further examples. Mesoudi, Whiten and Laland (2004) cite

¹⁸ Both use the older and more teleologically loaded term pre-adaptation

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anthropological and linguistic studies interpretable in a similar manner. Their examples are all from pre-industrial societies. The developing field of evolutionary geography¹⁹ and the population studies reviewed by Abatecola (2014) provide other potential examples even in today's more connected world.

Embryology. *The Origin* devotes only part of Chapter 13 to the embryologic evidence, the similarity of embryos in different clades at early stages in their development. Greiner's (1972, 1998) growth curve would seem to be a promising start. Indeed his 1972 examples of organizations clinging too long to old patterns could be said to be ahead of its time.

Systematics. The first part of Chapter 13 is devoted to the similarities revealed in hierarchical classifications. As Darwin put it, writing of such classifications=:

I believe that something more is included; and that propinquity of descent,—the only known cause of the similarity of organic beings,—is the bond, hidden as it is by various degrees of modification, which is partially revealed to us by our classifications

We have cladistic trees of manufacturing routines (e.g. McCarthy et al., 1997; Baldwin, Anderssen and Ridgway, 2013), search strategies (Tsinopoulos and MCarthy, 2002) while religious clades derived from current characteristics of different denominations can be shown to be historically accurate (Lord and Price, 2001) but the first two are normally seen as replicators rather than interactors while the last example tends to see religious denominations as species seeking to expand their range by capturing more members. There is perhaps a comparison to be made with scholastic disciplines (qua Toulmin op cit; Renwick et al. op cit.). Lord (2012) has restated a case for Cultural Linneanism though (see above) Distin (2010) has questioned whether eukaryotic branching cladistics is the appropriate or at least the only construct to apply when considering cultural evolution. The taxonomy of research

¹⁹ <http://www.geog.cam.ac.uk/research/projects/evolutionaryeconomics/>
<http://ideas.repec.org/p/egu/wpaper/1001.html> accessed 07 January 2014

or

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methodologies (Fig. 1 above) offers another obvious test.

We do of course have other facts which have added weight to Darwin's "accumulation and reflection". Mendelian genetics ultimately enabled the 'modern synthesis' greatly enhanced by modern molecular techniques. The latter have so far proven a single ubiquitous DNA structure as the universal replicator even as more is being learnt about the different expression of different genes in different contexts. The evidence is also mounting for the evolution of eukaryotes via the symbiosis of original prokaryotes (Lane, 2009).

Discussion

The literature from 30 or more years ago on 'qualitative' methods has been shown to have carried explicitly 'realist' or 'objectivist' ontological positions. In the intervening period it has radiated into discreet camps many of which show little or no ability to engage in conceptual exchange. Arguably theoretical and practical implications have equally been stymied. Greiner's (1972) observation that passage of time contributes to the institutionalization of managerial attitudes which become rigid, eventually outdated but also more difficult to change remains true over 40 years after he first made it. The point has been independently repeated many times. The ultimate cause, rather than the proximal observation of the phenomenon still eludes most mainstream organizational research. Equally we argue, as did Mesoudi, Whiten and Laland (2004) on a more anthropological scale, that a consideration of an accumulation of facts revealed by supposedly relativist research could reveal a new realism about what organizations are. Is conceptual evolution in fact an ultimate explanation of the, or some of the, proximal observations of Critical Realism?

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