



What is Cultural Science? (And what it is not.)

Jason Potts

School of Economics, Finance & Marketing, RMIT University, Australia

John Hartley

Centre for Culture and Technology, Curtin University, Australia; and School of Journalism Media and Cultural Studies, Cardiff University, Wales.

ABSTRACT

Hartley and Potts (2014) argue that cultural science represents a new theoretical and methodological approach to the study of cultural structure, dynamics and use. We explain how this differs from the extant analytic frameworks of cultural studies, both as a research program and as a policy platform. The central idea is to reconceptualize what culture is, through a reinterpretation of what culture does. We argue that the semiotic productivity of culture makes groups – which we call demes – and demes make knowledge (what we call the externalism hypothesis); and the interaction of demes makes *newness* – new knowledge. Cultural science, then, is a new model of the cultural processes involved in socio-economic evolution and innovation of knowledge-making demes. The paper is in three sections, the first on the exhaustion of cultural studies; the second on the emergence of cultural science; and the third on some implications for cultural policy – illustrated by reference to Matthew Arnold's policy on language preservation.

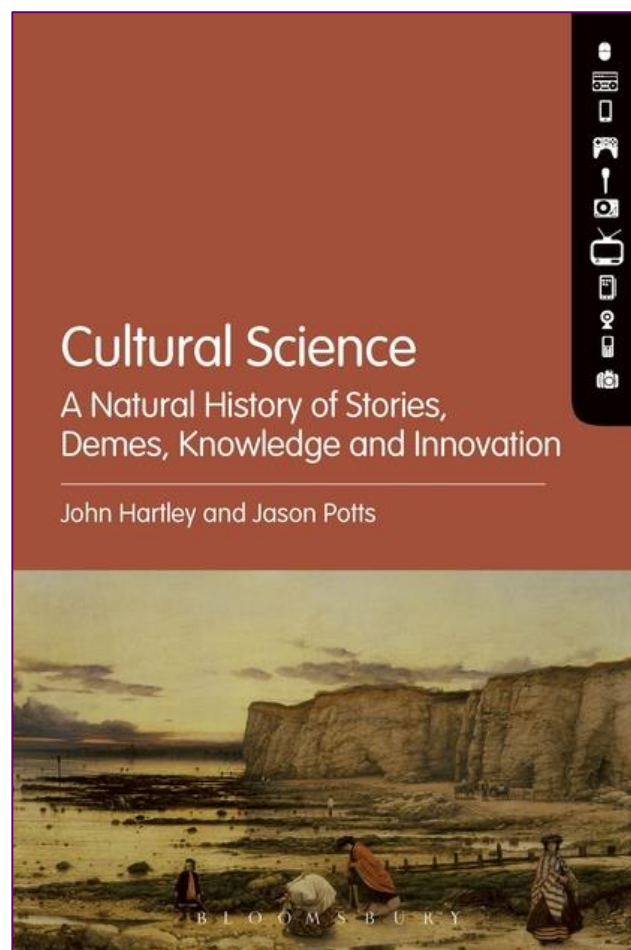
What is Cultural Science? (And what it is not.)

Jason Potts

School of Economics, Finance & Marketing, RMIT University, Australia

John Hartley

Centre for Culture and Technology, Curtin University, Australia; and School of Journalism Media and Cultural Studies, Cardiff University, Wales.



1 Cultural studies: old and new

Cultural Science: A Natural History of Stories, Demes, Knowledge and Innovation (Hartley and Potts 2014) is a new work of interdisciplinary synthesis that sets out the

endeavour to reinvent cultural studies from the perspective of modern humanities and social science. The modern social sciences in question are evolutionary neuroscience, evolutionary anthropology, evolutionary economics, economic sociology, evolutionary game theory, complexity science and marketing (e.g. Potts 2000, Herrmann-Pillath 2009, 2010, Bowles and Gintis 2011, Mesoudi 2011, Bentley et al 2011). The modern humanities are those of media and communications, including especially those that draw upon complex-systems based approaches to semiotics and society (Lotman 2009, Luhmann 2012) and recent work on the creative economy, especially in cities (see e.g. Hartley et al 2013).

In this paper, we will designate as ‘original’ or ‘old’ cultural studies that body of thought arising from the work of Raymond Williams (1958) and the Birmingham School led by Richard Hoggart and Stuart Hall through the Centre for Contemporary Cultural Studies. This approach was founded on the literary humanities: Hoggart’s ‘old left’ cultural criticism, not unconnected with the ‘angry young men’ of British literature at the time;¹ and social science models of critical theory, post-structuralism and analytic Marxism: Hall’s ‘New Left’ structural criticism, not unconnected with the ‘événements’ of May 1968 in Paris.² After a long and exhaustive engagement with all possible permutations of this tradition across a now-global intellectual enterprise (Dworkin 1997, Lee 2003, Hartley 2003, Turner 2012), we conclude that the productivity and explanatory power of ‘old’ cultural studies are exhausted. Our new approach, therefore, seeks to rebuild its foundations, while retaining the same line of intellectual inquiry into the structure and dynamics of ‘ordinary’ modern culture and the origins of meaningfulness.

We replace the political-theory based foundations with a different set of analytic starting points and approaches, drawn largely from evolutionary and complexity theory, in particular its formulation in modern evolutionary economics, as based about entrepreneurship, innovation and the growth of knowledge. Such work could hardly be further from the original affiliations (and reading lists) of ‘old’ cultural studies, but this is exactly what makes the experiment worth undertaking: it is high-risk, certainly, but – ever since the present authors embarked on this gruelling interdisciplinary journey in 2006 – it has proven to be intellectually, methodologically and conceptually productive; sufficiently, we believe, to re-found cultural studies for the century ahead.

This new evolutionary cultural studies, or ‘cultural science’ as we call it (Hartley and Potts 2014; Potts and Hartley 2014), seeks to study culture in terms of new knowledge and innovation. It is an emergent field, interested in the question of dynamic cultural change and adaptation, both as a social science question and as an inquiry into ordinary

¹ ‘Angry Young Men’ included writers such as John Osborne, Harold Pinter, Alan Sillitoe, Arnold Wesker, Keith Waterhouse and, later, Ray Gosling, Joe Orton; see Sinfield (2004).

² See: http://www.larousse.fr/encyclopedie/divers/événements_de_mai_1968/131140

culture and its agency. It is concerned with the role of culture in social, political and economic systems, but our particular interest is in culture as a productive, innovative mechanism – culture in use, facing the future, created by humans as a group ‘survival vehicle’ (Pagel 2012). We are concerned with how culture drives and changes society in itself (‘endogenously’, as the economists say) and how that then has political and economic impact and effects. We do not presume *a priori* that political and economic forces affect culture (‘exogenously’), as an external shock, producing an unstable asymmetry of power relations (‘hegemony’) among cultural ‘subjects’, which was a guiding precept of ‘old’ cultural studies (although the rhetoric of the day used the terms ‘base’ for economy and ‘superstructure’ for culture – Williams 1977). If anything, as we argue in the book, the arrow of causation is the other way round.

It is not insignificant that what we’re calling ‘old’ cultural studies was once *new* cultural studies (indeed, marked by the neologism ‘cultural studies’ to set it apart from ‘English literature’).³ It questioned the established model of cultural significance, represented by for instance John Ruskin, Matthew Arnold or T.S. Eliot, all the way through to Harold Bloom, the BBC, and ‘great books’.⁴ That imperial (but now apparently commonsensical) model sought to equate cultural significance and advance with what Williams (1977) dubbed the ‘selective tradition’ of rare, original – and therefore by definition decidedly unordinary – canonical works by ‘great’ authors and artists. Cultural studies emerged via the path-breaking critical unpacking of the class-assumptions in this approach by Hoggart and Williams. What became cultural studies was then ready to join battle under Hoggart’s successor, Stuart Hall, as a kind of civil rights movement for the mind, in common with other social movements and political currents of the time, seeking to emancipate ‘ordinary people’ into intellectual and cultural freedom by identifying the class basis of Arnoldian concepts of culture, noting the advantages accruing to those in possession of what Bourdieu (e.g. 1997) was to call ‘cultural capital’, and then using this knowledge to foment political action, not least through popular education.

Not only did this critique ‘decentre’ high culture and its universalist claims, but it also opened the way for the serious study of popular culture – not just as a socio-economic phenomenon with behavioural and political effects, but as a source of meaningfulness and cultural reproduction in its own right. Williams and Hoggart both drew attention to the anthropological ordinariness of mass-participation in cultural production and consumption. And both retained a modernist stance on literature, favouring ‘critical’ over other kinds of reading. Here was the rub, since most of what working people read (or watched, or listened to) came to them from sources other than their own institutions,

³ One of us has been associated with that enterprise for a long time: see especially *Understanding News*, published in 1982, which applied a ‘Birmingham’ approach to news media.

⁴ E.g.: <http://arts.unimelb.edu.au/masterclasses/10-great-books/>; or <http://www.greatbooksummer.com/> (etc.)

language or situation: especially from the ‘mass’ media, whose role in early twentieth-century totalitarianism, propaganda and mass persuasion was still acutely felt. They could hardly fail to notice the continuing asymmetry between corporate and state producers (owners and controllers of media systems) on the one hand and, on the other, a general population of untutored consumers looking for light entertainment at home.

Popular culture became the chosen ground for conceptual and political elaboration of the familiar thesis about culture as struggle – a constant grinding cha-cha of popular ‘containment’ *in* the ‘culture of the powerful’ and popular ‘resistance’ *to* it. The quest was not to understand culture, but to radicalize ‘the people’ while resisting the ‘populism’ of the ‘power bloc’. In Stuart Hall’s hands, in short:

Popular culture ... is one of the places where socialism might be constituted. That is why ‘popular culture’ matters. Otherwise, to tell you the truth, I don’t give a damn about it (Hall 1981: 239).

Cultural studies became preoccupied with power (Gibson 2007), an orientation that was given formal shape by Hall and the CCCS cadre, whose class analysis resonated with other social movements, extending ‘resistance’ from class to gender, race, sexuality etc.; and harnessing critical reading for the purposes of political activism. This power-centric agenda furnished a suite of new modern understandings of popular and media culture expressed in the language of a new political economy. Culture and media were revealed to be industries saturated with hegemonic significance.

One way of dismissing *new* cultural studies (*a.k.a.* cultural science) is by characterizing it as an attack on these political-economy foundations of ‘old’ cultural studies from ‘the right’. Indeed, many of our interlocutors to date have seized on this aspect (Miller 2004, Kenway et al 2006, O’Connor 2010, Turner 2012); tending to equate our work with ‘populism’ and thus some version of ‘neoliberalism’ (Flew 2012). It is true that both of us are critical of ‘political economy’ conceptualizations of media and culture, one from the perspective of a Hayekian branch of economics and the other from a ‘textual’ approach to culture. Nevertheless, to fixate on that aspect is to miss the point. The ‘new’ in new cultural studies (cultural science) is not a partisan endeavour, quite the reverse. It is simply not true to say, as Stuart Hall does, that if you’re not a socialist using popular culture for agit-prop then you *must* be a populist, ‘saying “Yes” to power’ (1981: 239-40). It never was a simple as that; it certainly isn’t now.

Thus, cultural science is an attempt to find new models for culture that *do* ‘give a damn about it’. We emphasize here the extent to which the ‘old’ cultural studies *underestimated* the significance of evolutionary forces in shaping human nature and society. ‘Old’ cultural studies settled for the more immediately scandalous issue of inequality in the ‘empire of the sign’, but in the end it missed a more compelling account

of culture as an evolutionary phenomenon. Cultural science reconstructs the study of ordinary culture using a more appropriate estimate (which is to say, large) of the significance of these forces as against political forces, which are not as powerful or as ubiquitous as they were perhaps once thought to be.

However, it is important not to leave the impression that just because we are critical of the ‘power/struggle’ version of cultural studies for its conceptual limitations, we accept the model of culture that it was struggling *against*. Not at all: ‘Arnoldian’ culture, which provoked the opposition of Hoggart, Williams and Hall,⁵ deserved everything they threw at it, and more. As we will show later in the paper, Arnold’s view of culture was itself an unadmitted version of social-Darwinist evolutionary claptrap. Its continuing influence is proof that the ‘old’ cultural studies approach was not compelling enough to unseat it. Perhaps cultural science can do better?

2 Theory: how culture works

Cultural science begins by recognizing that evolutionary and self-organizational mechanisms, operating in the economic and social domains of market institutions and social learning dynamics, are far more powerful than has been recognized hitherto by cultural studies. A significant reason for this is globalization and the development and diffusion of digital information via computational and communications technologies. Cultural science seeks therefore to update the study of cultural structure, dynamics and evolution to account for this suite of powerful evolutionary and complex-systems mechanisms for the generation of novelty and newness, emphasizing the productive consequences of cultural dynamics as a Schumpeterian-themed approach to economic ‘creative destruction’.

At the core of our version of cultural science (Hartley and Potts 2014, Potts and Hartley 2014) is a new model of how culture works, and specifically of how culture creates novelty and newness. The basic model is called ‘demic concentration’, and is built around the complex relationship and mechanisms at work in how culture uses and maintains knowledge, including how knowledge is acquired and diffused, and how culture produces new knowledge.

Externalism

The starting theoretical assumption of cultural science is *externalism*. This is a claim about the locus of human knowledge to the individual human actor. Cultural studies in particular, but postmodernism in general, has a propensity to argue that culture and knowledge are *situated* (Haraway 1988), meaning that culture does not reside in the individual, but in something closer to the social environment. This is used as a claim on

⁵ In Hall’s first book, *The Popular Arts*, co-authored with Paddy Whannel (Hutchinson, 1964).

the *social construction* of knowledge (Berger and Luckmann 1991; *cf.* Hacking 1999) wherein the intension of this approach (usually manifest as an attack on ‘methodological individualism’) was to politicize objective knowledge and reality. In methodological terms, culture could not be explained by taking individual behaviour as the unit of observation: hence, the ‘behavioural sciences’ (psychology in particular) were apt to be wrongheaded about culture, which was context-dependent and centred on meaning, relationships and identity, not generalizable from decontextualized behavioural actions. The well-funded, established and influential ‘psy-complex’ (Miller 2000) takes the individual as the starting point, the causal agent (and victim) of action, meaning, relationship, identity etc., whereas cultural studies saw these, including what we think of as ‘the’ individual, as the *product* of culture.

The cultural science approach to externalism is a related idea – in that it is also a challenge to methodological individualism – but it differs in several crucial respects. The foundational assumption is based in evolutionary biology and anthropology: *H. sapiens* is an extremely ‘groupish’ animal – that is our evolutionary niche (Bowles and Gintis 2011). Now that may explain why we take to politics or politicization so readily, but the root concept here is that we are a groupish animal, not that we are political animals (we are a political animal because we are group animals in a world of other groupish animals). The relevant question is not why are we political, but why are we groupish? Or, what makes us groupish?

The answer here is culture as group-forming semiosis. The purpose of culture is to make groups. We are the most cultural of all animals. These groups then enable *both* knowledge *and* individuals to develop: through the evolutionary mechanism of multi-level group selection, Boettke 1990, Nowak 2011). This is what we mean by externalism. In other words, ‘we’ don’t make culture; rather culture makes us. Culture links individual brains into a web of meaningfulness (language), relationship (sociality) and identity (group-position) that *supervenes* upon the individual brain. We are a species whose ‘brain’ has evolved to *link* brains, externally to each particular individual. Thus, communication is fundamental, not an afterthought. There’s no such thing as an individual prior to communication. Or, as Niklas Luhmann (1991, 2012) explained: individuals don’t communicate, only communication communicates. It is communication that creates individuality.

Put differently again, the evolution of culture is not an evolution (differential replication driven by variation and selection) of cultural artifacts and products, such as decorative arrowheads, sonnets, dance-moves, etc. Rather the evolution of culture plays out through the differential survival of groups and their knowledge (which may include agricultural knowledge, religious knowledge, scientific knowledge, weapons knowledge, and so on) as a test of the culture that makes those groups. Externalism thus means culture-made group

existence and knowledge-testing group competition (where politics is one of several forms that can take: direct conflict is another).

Deme

The central conceptual innovation in cultural science is the concept of a 'deme' and the mechanism of demic concentration. *Deme* is a concept that comes from ancient Greece, referring to a sub population of Attica, and upon which Athenian citizenship was based, and is the origin of demos/democracy. A deme is a group or association of non-kin living in close proximity. These demes can then be aggregated to make citizenship, forming the voting and juridical population of 'Athens' (139 demes). The term 'deme' has also been applied in evolutionary biology to refer to an interbreeding group, as a local subset of a *species*, which is the set of all organisms that can in principle interbreed: a deme is the population that is actually interbreeding. Evolution acts on demes, then, not species. We adopt this same word for an interbreeding group, and an inter-voting group, to an 'inter-knowing' group. A deme is a culture-made group or association that forms a 'we-community' built about culturally-made meaningful identities, which can then proceed to decision-making, action and enterprise on that basis.

Humans are a cooperative species, but other species are too. The standard theoretical account for cooperation (including altruism) is the gene-based theory of kin selection. Kin selection explains how we cooperate with those who share our genes (in proportion to that degree of kinship). But humans have taken cooperation well past the limits of kin to culturally made non-kin groups (demes). These 'we-groups' can occur at many different scales, including those that are family-sized, but not of the family (a hunting party, a peer group of friends, or a Chinese 'danwei' or workgroup); and also much larger ones, based on semiotic association, at the level of language groups (Pagel 2012), political groups, professional demes (industrial chemists), groups bonded by affiliation and knowledge (fans, taste-cultures, specialist-expertize), etc.

Deme theory does not see groups as simple aggregates or even 'assemblages',⁶ but as competitively-generated components in a larger system (the semiosphere or noösphere), in which the status of knowledge is radically altered by the position of the boundary between any 'we'-group and its others or 'they'-groups. On 'our' side, all knowledge is accessible and trustworthy; on 'their' side, knowledge is secretive, dubious, and potentially a direct threat. Deme theory therefore implies what we call 'universal-adversarialism': Cultures (demes) 'know' themselves and their externalities through

⁶ Nevertheless, Deleuzian 'assemblage theory', based on 'relations of exteriority' and 'assemblages' that describe 'emergent unities that nonetheless respect the heterogeneity of their components' (<http://plato.stanford.edu/entries/deleuze/>), shares important observations with cultural science, although cultural science has sought its conceptual framework in the evolutionary literature, rather than in that of contemporary continental philosophy. However, 'consilience' between these domains is not impossible to imagine.

knowledge itself: a 'we'-group is defined in opposition to a 'they'-group as universal knowledge is to adversarial knowledge. Our knowledge is universal (we can know anything and everyone can know it). Theirs is adversarial (it is designed to confound ours and we have nothing to learn from it). Further implications are that our knowledge is meaningful or true while theirs is not; and our knowledge is adaptable to any experience, niche, or challenge while theirs is out to prevent us occupying new domains (knowledge domains as well as actual ones). Actually, that self-confidence may prove to be fatally self-delusional, but without it exploration, experimentation and adaptation can't work. In point of historical and empirical fact, the occupation of new domains, and the generation of new demes, requires changes in the we-they boundary, such that 'we' may steal, borrow, copy, or conquer knowledge from other demes in order to secure demic survival.

The concept of the universal-adversarial deme enables us to talk about the process by which knowledge changes across human populations. The evolutionary population biologists led by Luca Cavalli-Sforza (2000) developed the concept of '*demic diffusion*' to describe the spread of knowledge that occurs as individuals migrate and move into new populations, taking knowledge with them. A companion concept is what we call '*demic concentration*' (Hartley and Potts 2014: ch 3), which explains how knowledge in a population can change, not as a result of individual change in the populations, but through change in the boundaries of the populations, shifting an idea from a they group to a we group.

A prominent and very ancient mechanism by which demes are constructed in the universal-adversarial formulation, is *storytelling*, including journalism. Hartley and Potts (2014: ch 3) run through a number of examples drawn from teen fashion media (Tavi Gevinson); the formation of national character through war journalism (Gallipoli), and through what we see as the first evidence of how demic identity itself was 'broadcast' through storytelling in the Neolithic constructions at Göbekli Tepe (Schmidt 2010) and Stonehenge (Parker Pearson 2012). These are instances of the mechanism of demic concentration making identity and meaningfulness into groups in which knowledge can develop.

Malvoisine

Humans are a groupish animal, but that is not the same as saying that we are a cooperative animal. As Herbert Gintis explains: we are 'a prosocial groupish animal, honed by conflict and extinction.' We cooperate with our group (Boyd and Richerson 2009) – our culture-made deme, and against out groups ('they'-groups to our 'we'-group). We call this natural cultural phenomenon *Malvoisine* ('bad neighbour' named after King Phillip II of France's siege engines (a *trebuchet* or catapult).

Bad neighbours have different knowledge. That's an outworking of the logic of a deme, which creates a group within which knowledge develops. It's equivalent to saying that

different species have different genes. Groups can interact in different ways – including exchange or trade, which takes place between individuals in respective groups, bringing ideas from one group to the other (i.e. ‘demic diffusion’) – but this interaction can also happen directly through group conflict which takes place at the boundary where two (or more) groups meet.

Biologists analyse this with forms of group selection theory, but social scientists have a further option that is not much seen in non-human nature, namely reciprocal exchange, or market-based trade. We tend to think of exchange as cooperative because it is mutually non-coercive; and we think of conflict as, well, not cooperative, because one side is usually an aggressor. We also tend to think of defeat and subsequent conquest as not cooperative because the submission is forced, a consequence of being overpowered and of losing a fight (experiencing involuntary demic boundary-change). But from the cultural science perspective, or even just viewed over a longer time period, this is not necessarily so: conquest can be cooperative from the perspective of the *growth of knowledge*.

Conquest redraws the boundaries of a deme, enlarging a we-group to include parts of a former they group - this is the mechanism of ‘demic concentration’. Knowledge that was previously not meaningful (because it was ‘theirs’) is now made meaningful – it is ours; it is integrated into our story. A common example would be what happens to food, both ingredients and cooking styles, when demic groups clash: the result is an enriching of the local culinary repertoire. What was previously ‘what *they* eat’ (slugs and snails and puppy-dogs’ tails) becomes ‘what *we* eat’ (sugar and spice and all things nice), made of ingredients combined from previously adversarial cultures (thus, in Australia, the eventual incorporation of southern European and east Asian cooking into a new, tourism-friendly ‘fusion cuisine’). This clash of systems is equivalent in its effect to the production of newness and innovation, and results in the reproduction of culture *and* its adaptation to new circumstances.

A further line concerns the growth of knowledge effects of cultural and political globalization. The standard exchange model predicts that globalization results in greater producer specialization, say each country or deme, specializing in producing what it has a comparative advantage in, and then exchanging this for the rest. Consumers benefit because production is concentrated on those with the greatest comparative advantage, which will mean at lowest price, but also consumers face a choice of cultural products from the entire world, not just from their nation, or region. This is the exchange case for the benefits of global openness in goods, including culture. The costs of cultural protectionism, in turn, are argued to fall largely on consumers, who pay higher prices and face less variety of choice, reducing their utility.

But there is another angle to this that cultural science points up, namely that a melting-pot view of globalization (one market, one language, etc.) risks consuming its own fuel of

newness, of the kind that demic conflict furnishes. Competition is said to facilitate creativity and productivity because it puts a price on slack efforts. But conflict does too through the mechanism of demic concentration by changing the meaningfulness of ideas. Forces that reduce conflict (or promote harmony and oneness) thus also reduce the possibility of demic clash as a source of newness. Perhaps this is why and how demic conflict is still so prominent in semiotic, ritualized or narrative forms (from mediated conflict in movies to sporting and scientific races to the Cold War and arms races).

Our analysis of demic conflict over evolutionary time is that, once scaled up from Neolithic bands (themselves often large – up to 600 members) to historical states and empires, the self-organising and autopoietic mechanisms of deme-formation are taken over by state apparatuses, with the result that ‘civilization’ has proven to be a good deal more violent than ‘natural’ (aggressive) behaviour would predict. Thus there is still quite a lot we don’t understand about ‘globalization’ when demic knowledge is ‘concentrated’ by states or corporations rather than communities. Our best guess at what demic evolution might look like at other than at imperial scale is the phenomenon of ‘creative cities’ (Hartley, Potts & MacDonald 2012). Here, different demes, incommensurable groups and mutually untranslatable semiospheres collide, clash and ‘interanimate’, producing new meanings at the edges of multiple boundaries, both real and imagined (cultures based on proximity, from industrial clusters to ethnic or specialist ‘ghettoes’ to cultural ‘scenes’). It took ancient and medieval cities a long time to ‘abstract’ functions from the bodies that carried them; bodies that were traditionally identified by religion, region or race, such that ‘Jewish’, ‘Lombard’ or ‘Huguenot’ quarters, Little Italy or Chinatown might evolve into trading, financial and lacemaking districts, or signify cuisine and retail choices for cosmopolitan populations.

Having said this, it has also been commonplace over long history for cities as a whole to be conquered, to be dismantled or abandoned under threat, or to ossify and decline into obscurity. Do their complex knowledge systems and relationships die out too, or are they incorporated into the knowledge systems of conquerors? Cities may die through changes in habitat (Pompeii; Fukushima), but also via ‘predation’ (Carthage; Vijaya Nagara).⁷ Entire cultures become extinct. Over the long term, cities and demes are regularly extinguished, but culture continues and knowledge grows, also becoming more abstract and detached from cultural context (as ‘know-how’ rather than ‘know-what’). Given that such ‘inconvenient truths’ seem to point to conflict, conquest and extinction as inevitable events in the process whereby humanity has adapted, grown and generalized across time, space and niche, how should new cultural studies investigate cultural death and extinction? Our answer is that the object of study has been misidentified: it is not ‘power’ (over an individual entity) but ‘knowledge’ (as an adaptive complex system) that survives in successor cultural ‘species’, i.e. new cities and cultures – new demes.

⁷ <http://en.wikipedia.org/wiki/Vijaynagara>.

Meaningfulness

Does culture evolve? Many humanities scholars have gone to great lengths to keep evolutionary thinking out of the humanities and cultural studies (with some exceptions, e.g. Boyd 2009, Carroll 2011). By contrast, anthropologists routinely accept that culture does indeed evolve.⁸ They offer a standard Darwinian model in which *units of culture* differentially replicate under selection pressure (Mesoudi 2011, Boyd and Richerson 2005). Cultural science draws heavily on evolutionary theory as the study of an evolutionary adapted animal *H. Sapiens*. But in cultural science, ‘what evolves’ is not units of culture but, more accurately, it is *meaningfulness*.

The study of the growth of knowledge from an evolutionary perspective has tended to focus on the replicative units of culture: ‘memes’ for example, in Richard Dawkins’s (1976) formulation. The idea was that memes are to culture what genes are to biology: the basic evolutionary unit of variation, selection and replication, and in both cases a form of information (which can be extended to the concept of semiosis, see Hull et al 2010). There is a lot of value in this analogical model, even verisimilitude. It places *social learning* at the centre of analysis, as the mechanism by which replication and selection operate. But note that once culture is understood from the demic perspective, as a the variety-creating and selection mechanism itself – rather than some other ‘agency’ individual genius perhaps, or ‘cultural selection’ – then it becomes clear that something else must be the cultural evolutionary unit, and that something must have valorizing properties with respect to *groups* (demes). Meaningfulness is complex and semiotic, attaching to ideas and knowledge within a deme: it is in this sense that meaningfulness evolves rather than the products and things (cultural phenotypes) that it attaches to.

An example that we use in the book is the late 17th and early 18th century British invention of the *gentleman*, which was a cultural innovation created at the boundaries of conflicted demes: namely, aristocratic behavioural norms and manners (honour and chivalry, in particular) combined with a practical bent toward adventuring and exploration in the realms of engineering, science, business or travel (rational experimentation, in particular). Thus the ‘gentleman’ could add to what Veblen identified (1899) as aristocratic (but barbarian) ‘exploit’ a new adventure playground – the exploration of modern, scientific knowledge and of natural and material processes:

A distinction is still habitually made between industrial and non-industrial occupations; and this modern distinction is a transmuted form of the barbarian distinction between exploit and drudgery. Such employments as warfare,

⁸ However, anthropology too was slow to become an evolutionary science: It certainly had not achieved that status by 1955, when Julian Huxley wrote a significant (but not widely remembered) guest editorial for the *Yearbook of Anthropology* on ‘Evolution, Cultural and Biological’ (Huxley 1955).

politics, public worship, and public merrymaking, are felt, in the popular apprehension, to differ intrinsically from the labour that has to do with elaborating the material means of life. The precise line of demarcation is not the same as it was in the early barbarian scheme, but the broad distinction has not fallen into disuse. (Veblen 1899, ch1)⁹

As a result, science itself became a gentlemanly pursuit (the archetype perhaps being Joseph Banks), and its outcomes – ‘useful knowledge’ – could be industrially applied. ‘The gentleman’ was a new deme that made behaviours that were previously outside the range of meaningfulness intensely meaningful and therefore operational within a new group. Deirdre McCloskey’s (2010) work on ‘bourgeois dignity’ argues that this provided the motive cultural force behind the first industrial revolution.

Another example is *cities*, which are crucibles of demic intensity and sites of continual clash and conflict as different systems of meaningfulness rub up against each other. Cities are where newness and innovation emerge from unstable and contested boundaries between different meaning systems. This view of cities as sources of cultural innovation and regeneration correlates with established findings in the study of the creative industries in particular, and innovation more generally, that observe the utter dominance of cities in the production of new ideas and innovation. This seems to conform to a power law distribution (Bettencourt et al 2008) with a handful of ‘world cities’ accounting for most of this output. Some cities are more creative and innovative than others, and this can be explained in cultural science as a property of demic concentration (Hartley et al 2012) rather than with the standard models of increased investment and largely unexplained ‘spillovers’ or externalities. Cities are sites of demic concentration where meaningfulness is tested through conflict and tension (Vedres and Stark 2010).

According to cultural science, the productivity of cities is based on the continual interactions of ‘clash, cluster, complexity, creativity’ among many different demes and institutions.¹⁰ Cities – especially growing, attractant cities – are characterized by what we call ‘demic concentration’: the co-presence, overlap, clash and clustering of more demes than other forms of human complex organization. As a result, individual citizens occupy more ‘demes per person’ (Hartley & Potts 2014: ch10), compared with earlier times and other places. This process in turn produces a greater intensity of ‘urban semiosis’ that expresses the difference between demes, and their interactions and coordination, via communicative networks (journalism, media and art as well as streets and places to mix and mingle – scenes, markets, public buildings, including GLAM institutions etc.). Cities

⁹ <http://www.gutenberg.org/files/833/833-h/833-h.htm>

¹⁰ For this formula, see: www.slideshare.net/AHRC/cchartley – from this event: www.ahrc.ac.uk/Funding-Opportunities/Research-funding/Connected-Communities/Pages/Past-activities.aspx

are complex systems that coordinate complex systems; they generate thereby a higher and accelerating rate of productivity of newness and innovation in ideas. This process includes not simply industrial innovation but also ‘microproductivity’ (both semiotic and economic) among citizens, on the model of gentlemanly ‘exploit’ but across a far wider social base, thereby extending the generation of economic values from firms to social networks. The greater number of demes per person, the higher the level of urban semiosis: this is the driver of creative cities and accelerator of creativity.

Newness

The traditional way to think about culture is behaviours, norms and artifacts in the present that conspicuously draw from the past. From that perspective, culture is readily reduced to what Williams (1977) called the ‘selective tradition’ – confining the term only to ‘the best’ and most valuable such behaviours, norms and artifacts. Manners are an example, but so are styles of clothing and architecture, decorations, music, and so on. This is not only an ideologically laden view of culture, as Williams argued, but it is also, necessarily, backward looking. Not only does it underpin the Arnoldian concept of high culture, but it also shows up in the socio-political view of culture as something vulnerable as well as venerable, requiring preservation and protection.

This is in fact an *anti-evolutionary* move, because the ‘selective tradition’ is not seen as random, but as managed, where ‘criticism’ decides on evolution’s behalf what is worthy of preservation in the present. Thus, the predominant discourse on ‘culture’ works not to identify what successfully replicates, subject to random variation and mixing, and how that process can be understood, but to identify that which is valuable from the past. Such thinking turns into large-scale policy, investment and institutionalized forms of practice where identifying what is valuable from the past turns to *protecting* it from the new: especially where it is under threat by some new force, say ‘the market’ or ‘globalization’. Such policies are designed to halt cultural evolution.

Cultural science is not built around a backward-looking view of culture, but rather about a forward-looking view. That is not to say that culture has no past-facing tendencies and function; indeed, we see culture as ‘Janus-faced’. But to base scholarly research, public policy and popular education on one ‘face’ only is to misunderstand culture. Thus, cultural science conjoins the culture-as-inheritance perspective with a forward-looking one by introducing the evolutionary idea of *replication with newness*.¹¹ Cultural sources of newness (Hutter et al 2010) are explained in terms of externalism, demic concentration, Malvoisine, and the evolution of meaningfulness.

¹¹ Here we draw on the work of Alex Bentley and his teams, on the ratio of random copying to independent thinking (innovation) in various cultural phenomena. See: <http://www.cecd.ucl.ac.uk/projects/?go1=156>.

In essence, cultural science contributes a third possible answer to the question of the source and origins of novelty and newness. The first answer, which comes from physics and biology, is *randomness*. Novelty and variety are the product of random interactions, of fluctuations, accidents and mutations, upon which the real work is then done by the selection mechanisms that re-equilibriate the dynamical system. The second answer, which is located in the study of the human mind and its products, is *consciousness*, creativity and sometimes genius. There is a certain attempt to understand this mechanism and its internal and environmental correlates, but the practical concern is usually with how to find and harness these creative alpha-particles. The third mechanism is that *demes make newness*. This occurs not through random variation and selection of culture-particles; not through native (but unevenly distributed) repositories of genius; but through a *semiotic group-making* (and hence group-conflicting) process that redraws demic boundaries, revealing new sources of meaningfulness.

Waste and Extinction

Culture is forward facing; and demes make newness. These are both elemental principles of cultural science, along with externalism. As a result, cultural science's approach to *policy* looks rather different from either cultural-studies policy (which is focused on power and preservation) or cultural-economics policy (which is focused on the 'arts sector' – and its preservation). To appreciate better how the principles of cultural science may form a bridge into policy it is instructive to consider the role of both *waste* and *extinction* in the cultural science theory of how culture works and of the cultural process.

Waste is the opposite of efficiency, and therefore not part of any recommended cultural economics program. Extinction is the opposite of preservation, and therefore not part of any orthodox approach to cultural policy. But both of these processes – waste and extinction – are integral to the cultural science account of how culture works, and, in turn as a basis for cultural policy.

Optimal efficiency of cultural production is actually massively wasteful by any static account, and moreover needs to be. To understand why, one needs to look to nature where in essence all replicative processes involve the production of millions, billions and even trillions of gametes to create a single zygote. This is not nature being wasteful (were that so, selection would have removed this mechanism millions of years ago.) Rather, this is nature 'efficiently' refining the core mechanism of replication, which is ultimately a form of communication, namely, *proximity*. To achieve proximity is to send a message that *may* get through, although to achieve consummation – meaningfulness – is by no means guaranteed, since much incoming information is not even perceived, never mind communication (Luhmann 1991). The best strategy therefore is to send out lots of messages. This is how communication works as semiotic productivity (Lotman 2009); the model is that of *successful reproduction* in nature, which is achieved by what looks like

profligate waste of sperms, eggs, and offspring simply to achieve the reproduction of two individuals.

Children – human offspring – are not generally wasted in the way that seeds, planulae and baby turtles are: not fed by their parents, by the thousand, into the waiting mouths of monsters. Nevertheless, they are treated both economically and culturally as ‘wasteful’ creatures: impotent, unproductive, irresponsible and not yet fully formed for *participation* in culture or the economy. They are construed in principle as lacking independent agency and rationality. They need to be protected (and corrected) because they are perpetually ‘at risk’.

Cultural science doesn’t see children that way. Instead, noting their role in semiotic and cultural regeneration. A simple example of this is accents, which by definition have to be made by children as they learn the tone, stresses and inflections that they find in their environment. The distinctive Australian accent was not made by immigrants but by their children. Field linguists such as Carmel O’Shannessy and Felicity Meakins, working with Aboriginal demes in northern Australia, have discovered that this capability extends beyond accent to the invention of new languages *by children* (i.e. not by ‘elders’).¹² Children are also inveterate joiners and splitters, deme-making animals of the highest efficiency and productivity (Konner 2010). To understand culture is to view it through the lens of semiotic productivity through, at minimum, language, waste, and children. The reason cultural science is interested in children, seeing daydreaming, mischief, play, crazes, BFFs, peer-group cliques and so on as inventive not wasteful, is because we do not see childhood as a static state or condition, but as the period of deme-formation and multiplication, extending out from kin to community and beyond as children ‘invent the future’, not as individuals but in constantly expanding demic groups, both real (community) and virtual (communication). We interpret childish activities as a cumulative process that direct families and thence communities progressively towards the needs of the future, in direct opposition to those of the past.

Cultural extinction is also not what it seems, which is the species analogue of death. Tutored by cultural heritage discourses, we tend to regard extinction as a tragedy, but nature certainly doesn’t. Indeed, it seems to be ‘one of its favourite things’. By some reckonings, 99.9 per cent of species that have ever existed are now extinct. The same sort of proportion goes also for languages, demes, and even cities. Most are extinct. The longest-lasting human construction is the ruin. But our inherited view of culture wants to site *cultural value*, not on the construction, but on the ruin. The language of cultural

¹² The languages are Warlpiri Light (O’Shannessy) and Gurindji Kriol (Meakins). See: http://en.wikipedia.org/wiki/Light_Warlpiri; and http://en.wikipedia.org/wiki/Gurindji_Kriol_language.

extinction has been widely adopted by various cultural agencies (from UNESCO down to your local council). And the response seems clear: protection.

This strong guardianship approach, in conjunction with regulation, is favoured over market mechanisms, because what the ‘endangered’ cultures and places are regarded as being ‘at risk’ *from* is the market or globalization. Policy is hardly going to leave charismatic survivors to the mercy of the very forces that are ‘ruining’ them. The SOS slogan is transferred from species to monuments; in both cases, what stirs up saver-activism are charismatic ruins – big and beautiful animals and spectacular places or artifacts; not species or cultures that are regarded as insignificant, ugly or threatening. We rejoice at the extinction of bugs (smallpox); we cheer when a cultural tradition that shows anti-social tendencies (‘extremism’) is defeated. So it’s certainly a ‘selective tradition’ approach, which uses a ‘market failure’ model without noticing that there’s an ‘ideas market’, or what Lanham (2006) calls an ‘economy of attention’, that is relentlessly at work in selecting *which* species are to be saved (whales yes; slugs and snails no); and *which* cultures are to be protected from the market (elite cultures of the past; not marginal cultures of the present).

Thus, the problem with this protective approach is that it may do more harm than good. Notwithstanding the uneven value system that ‘saves’ *this* while slaughtering *that*, the very act of ‘protection’ is itself destructive, a bit like the preservation of dead leaders’ bodies (notably, Lenin’s in Moscow, Mao’s in Beijing):¹³ embalmed, entombed, and displayed for acts of reverent religiosity by tourists, but actually *made* of chemicals, pumps and *trompe l’oeil* worthy of Hollywood at its most postmodern. The mask is preserved, while the generative and uncertain part of the culture is taken out of circulation, transforming it into something ceremonial and hidden.

The main thing that then happens is *ossification*, disguised as splendour (culture *as* the sacred reliquary or embalmed leader). It is no longer adapting and changing, rubbing up against other ideas and meanings. Indeed, that was precisely the point of the protective action. In the standard model, protection is preservation, so that others may see the relic in a museum, say, or a schoolbook. In some places – Venice, famously – an entire city can be so preserved. But in others – say, The Venetian casino in Macau – the *idea* can be repurposed in immersive 3D, and used for other values entirely. The former is ossification; the latter innovation.

¹³ Other countries who’ve pickled their leaders include Vietnam, North Korea, Venezuela, Argentina – and of course Pharaonic Egypt. See: <http://www.bbc.co.uk/news/magazine-16283257>; <http://www.thejournal.ie/venezuela-chavez-embalmed-mao-lenin-823719-Mar2013/>; <http://www.washingtonpost.com/blogs/worldviews/wp/2013/03/08/a-photographic-guide-of-the-worlds-embalmed-leaders/>



Venice – intellectually ossified; Macau – innovatively candy-flossified?¹⁴

3 History and Policy: How culture doesn't work

In the cultural science model, the act of cultural preservation has already killed the thing it loves, just as a beautiful cut flower is already a corpse, because it can no longer generate newness, and because it is no longer interacting with other elements of meaning in a semiosphere. What's wrong with this is not so much the flower-pressing urge to preserve an item of beauty or significance but, more fundamentally, the failure (or opportunity cost) to understand and value the *system* – ecosystem, semiotic system – that produces the valued efflorescence in the first place. That results in a cultural policy setting that pays big bucks for cut flowers, but then wonders why they don't propagate. There's a policy vacuum around future-facing efforts to help a system to *self-organize*, in conditions of uncertainty.

Thus, cultural science is not simply advocating 'market' versus 'public' interventions but, more generally, it draws attention to how different demic-semiotic systems behave internally, how they intersect with other systems, and how meaningfulness is produced in the process. Policy advocacy from a cultural science perspective would then focus on identifying system boundaries, dynamics and interactions, and on removing impediments to the growth of knowledge and innovation. It would look for *innovation at the margins*, or what Charles Leadbeater has called 'learning from the extremes' (Leadbeater & Wong 2010). Cultural science is not in the business of promoting 'survival of the fittest' analogies in the name of evolution. It does not criticize efforts to defend and champion

¹⁴ The Venetian sky is painted; the gondola rides are real:
<http://www.venetianmacao.com/shopping.html> (this picture at: <http://www.cgeg.net/hotel.html>).

inherited culture, if the effort comes from the populations whose culture it is (as a push-back against a stronger neighbour or Malvoisine, for example). It simply looks for 'innovation policy'. Criticism is reserved for top-down, effectively exogenous policy, which is applied to selected cultural traditions in the name of values that the culture in question may never have found meaningful. An example drawn from the work of Matthew Arnold himself will demonstrate the point. His very different 'policy' for two British languages, English and Welsh, requires that the *survival* of one entails the *extinction* of the other:

The fusion of all the inhabitants of these islands into one homogeneous, English-speaking whole, the breaking down of barriers between us, the swallowing up of separate provincial nationalities, is a consummation to which the natural course of things irresistibly tends; it is a necessity of what is called modern civilisation, and modern civilisation is a real, legitimate force; the change must come, and its accomplishment is a mere affair of time. The sooner the Welsh language disappears as an instrument of the practical, political, social life of Wales, the better; the better for England, the better for Wales itself. (Arnold 1867: 12, our emphasis.)

Arnold looked forward to the extinction of Welsh; he saw it as the moral duty of the English to expunge it from 'the practical, political, social life of Wales' in the name of 'modern civilization' and unity, where 'one homogenous ... whole' is achieved by the favoured nationality 'swallowing up' all the others. He advocated cultural means – trade, tourism, education and 'living' literature – as instruments of this public policy against the Welsh language, 'hammering it harder and harder' in order to hasten its extinction:

Traders and tourists do excellent service by pushing the English wedge farther and farther into the heart of the principality; Ministers of Education, by hammering it harder and harder into the elementary schools. Nor, perhaps, can one have much sympathy with the literary cultivation of Welsh as an instrument of living literature; and in this respect Eisteddfods encourage, I think, a fantastic and mischief-working delusion. (p. 12)

Only once this hammer has been wielded, to tenderize the tasty morsel ready for swallowing up, is he ready to reveal what should be *preserved* of Welsh, to make it palatable to the English maw. That is: its *past*. Thus, he championed the cause of scholarship in Celtic Literature, as the expression of a strictly medievalist 'Celtic twilight'¹⁵:

¹⁵ W. B. Yeats's *The Celtic Twilight: Faerie and Folklore* was published in 1893.

It is not in the outward and visible world of material life, that the Celtic genius of Wales or Ireland can at this day hope to count for much; it is in the inward world of thought and science. What it has been, what it has done, let it ask us to attend to that, as a matter of science and history; not to what it will be or will do, as a matter of modern politics. It cannot count appreciably now as a material power; but, perhaps, if it can get itself thoroughly known as an object of science, it may count for a good deal, – far more than we Saxons, most of us, imagine, – as a spiritual power (pp. 15-16).

Arnold saw this policy as progressive: the idea was to make safe from politics and practice the ‘ancient’ ‘monuments’ of ‘Cymric genius’ so that they could be studied – even by ‘Saxons’ – in order to access the ‘spiritual power’ of the Celts, which had hitherto been suppressed because of racial antipathy:

I remember, when I was young, I was taught to think of Celt as separated by an impassable gulf from Teuton... such was the sense of repulsion, the sense of incompatibility, of radical antagonism [among ‘Saxons’ for ‘Celts’], making it seem dangerous to us to let such opposites to ourselves have speech and utterance. Certainly the Jew, – the Jew of ancient times, at least, – then seemed a thousand degrees nearer than the Celt to us. (pp. 18-19)

These wild racist ravings are in fact a lucid articulation of a policy of *universal-adversarial ‘Malvoisine’*, recruited to the cause of culture. Arnold cannot construct his sense of the ‘we’-group, the ‘Saxon’ or ‘Teuton’, as the bearer of universal meaningfulness, without seeing as ‘dangerous’ the ‘speech and utterance’ of other languages and races – ‘they’-groups. He wanted not to *save* the Welsh language but to *incorporate* its knowledge – once it was confined to the ‘spiritual’ – *for* the benefit of the English. This is *demic concentration* in action, to be achieved by a Bad Neighbour devouring an entire culture.

It may have seemed ludicrous or worse (not least to Welsh-speakers) but the practical effects it produced were all too real. Even as schools and other public institutions were ‘hammering’ Welsh by forbidding its use in daily life, Arnold, an Inspector of Schools, was laying the ideological ground for Welsh to be removed from troublesome reality and placed in the ‘inward world’ of the university. Within a few years, one John Rhys, another Inspector of Schools, was appointed as the first Oxford professor of Celtic Studies, and later knighted for it.

Arnold’s ‘cultural policy’ had prevailed. *This* language for the future; *that* one for the past – never mind what its own speakers many want. It was a model that stood ready

thenceforth to be transported around the world, on the wings of empire; and, later, through the circuits of might-as-well-be-monoglot digital media.¹⁶

However, the Welsh language rather impolitely ignored the policy prescription. It stubbornly refused to die. Welsh-speakers wanted to use it for everyday life, for commerce and public colloquy and for facing the future as well as the past. It took another century or more, after long campaigns of civil disobedience and political activism up to and beyond the 1970s and 80s, before the Welsh language's status as a living language was finally recognized in Wales. Now, it is to be found in schools, in government, in broadcasting, in shops and offices, on road-signs and in cafes and clothes shops. It is very active online, in music and media. It is also officially supported with government funding, where once only the 'Welsh Not' had prevailed.

Thus, in the 'outward and visible world of material life' there has proven to be a coherent cultural policy for supporting the Welsh language, not to 'preserve' it (in Oxford, if not in aspic), but in order to make it available to its own population, to work out for themselves 'what it *will* be or *will* do, as a matter of modern politics' – the very opposite of Arnoldian cultural policy. Much of the creative innovation currently flourishing in Wales does so in the environs of the Welsh language: it's a crucible of *newness*. Its speakers' efforts to promote diversity and self-organizing sustainability for a minority language are not the same as those designed to 'preserve' (for another purpose, another language) a past-tense cultural relic for a master-language. As a result, Welsh is now a model for how other minority languages in close proximity to powerful (and still dubious) neighbours can use new media, new technologies, and cultural politics to survive and adapt for the future.¹⁷

From the perspective of cultural science, this is a telling story because of Arnold's continuing significance in the history of cultural studies, cultural policy and the institutionalization of canonical high culture, not just in Britain but internationally. Arnoldian culture still enjoys widespread public subsidy in pursuit of that 'spiritual power' which he thought could produce 'Englishmen' of 'a new type, more intelligent, more gracious, and more humane'.¹⁸ That may sound appealing, but it turns out to be just a banal form of social-Darwinist supremacism. For Arnold, the 'best that has been thought or said' had to be said *in English*; and equally it also had *not* to be said in Welsh. Universal-adversarialism had found its cultural theory.

¹⁶ Although here, as with Welsh, other tongues have something to say about that, notably Mandarin Chinese, Spanish and other languages boasting more speakers than English.

¹⁷ Thus, one of us is involved in ARC-funded research with members of one of Australia's largest Indigenous groups, the Noongar people of SW Australia, whose language has reached 'endangered' status. Our research question is simply: 'Why is there no Noongar Wikipedia?'

¹⁸ Introduction to 1891 edition of *Celtic Literature*: <http://www.fullbooks.com/Celtic-Literature1.html>.

Arnoldian culture turns out not to be based on ‘market failure’ at all, but on a secularized religiosity based on presumptions of ‘irresistible’ racial and linguistic superiority. This is why a new approach to cultural science is needed, one that invokes evolutionary theory in order to understand evolution and the evolution of culture: not simply to justify existing arrangements, as in Arnold; or to criticize them, as in ‘old’ cultural studies; but to enlarge our understanding of what culture can be *for* in uncertain times.

References

- Arnold M (1867) *On the Study of Celtic Literature*. London: Smith, Elder. Online: <https://archive.org/details/onstudycelticli03arnogooq> (1891 edn, with new introduction: <http://archive.org/stream/celticliterature05159gut/celt10.txt>).
- Bentley RA, M Earls and M O’Brien (2011) *I’ll Have What She’s Having: Mapping Social Behaviour*. MIT Press: Cambridge, MA.
- Berger P and T Luckmann (1991) *The Social Construction of Reality*. London: Penguin Books.
- Bettencourt L, J Lobo, D Helbing, C Kuhnert, G West, G. (2007) ‘Growth, innovation, scaling, and the pace of life in cities.’ *Proceedings of the National Academy of Sciences*, 104(17): 7301-6
- Boettke P (1990) “The Theory of Spontaneous Order and Cultural Evolution in the Social Theory of F.A Hayek.” *Cultural Dynamics* 3:61–83.
- Bourdieu P (1997) ‘The Forms of Capital.’ In AH Halsey, H Lauder, P Brown, and AS Wells (eds) *Education: Culture, Economy, and Society*. Oxford: Oxford University Press, 40-58.
- Bowles S and H Gintis (2011) *A Cooperative Species: Human reciprocity and its evolution*. Princeton NJ, Princeton University Press.
- Boyd B (2009) *On the Origin of Stories: Evolution, Cognition, and Fiction*. Cambridge, MA: Harvard University Press.
- Boyd R and P Richerson (2005) *The Origin and Evolution of Cultures*. Oxford: Oxford University Press.
- Boyd R and P Richerson (2009) ‘Culture and the Evolution of Human Cooperation’. *Philosophical Transactions of the Royal Society B*, 364: 3281-88.
- Carroll J (2011) *Reading Human Nature: Literary Darwinism in Theory and Practice*. New York: SUNY Press.
- Cavalli-Sforza L (2000) *Genes, Peoples, and Languages*, New York: North Point Press.
- Dawkins R (1976) *The Selfish Gene*. Oxford: Oxford University Press.
- Dworkin D (1997) *Cultural Marxism in Postwar Britain: History, the New Left, and the Origins of Cultural Studies*. Durham NC: Duke University Press.
- Flew T (2012) ‘Michel Foucault’s *The Birth of Biopolitics* and contemporary neo-liberalism debates’. *Thesis Eleven*, 108(1), 44-65.

- Gibson M (2007) *Culture and Power – A History of Cultural Studies*. Oxford: Berg.
- Hacking I (2000) *The Social Construction of What?* Cambridge MA: Harvard University Press.
- Hall S (1981) 'Notes on Deconstructing "the Popular"'. In R. Samuel (ed.) *People's History and Socialist Theory*. London: RKP.
- Haraway D (1988) 'Situated Knowledges.' *Feminist Studies* 14(3): 575–599.
- Hartley J (2003) *A Short History of Cultural Studies*. London: Sage Publications.
- Hartley J (2009) *The Uses of Digital Literacy*. UQ Press: Brisbane.
- Hartley J and J Potts (2014) *Cultural Science: The Natural History of Stories, Demes, Knowledge and Innovation*. London: Bloomsbury.
- Hartley J, J Potts and T MacDonald with C Erkunt and C Kufleitner (2012) *Creative City Index. Cultural Science*, 5:1 (whole issue).
- Hartley J, J Potts, S Cunningham, T Flew, M Keane and J Banks (2013) *Key Concepts in Creative Industries*. London: Sage.
- Herrmann-Pillath C (2009) *The Economics of Identity and Creativity: A Cultural Science Approach*. St. Lucia: UQP; New Brunswick NJ: Transaction (2010).
- Herrmann-Pillath C (2010) 'What have we learnt from 20 years of economic research into culture?' *International Journal of Cultural Studies*, 13(4): 317-35.
- Hutter M, A Berthoin Antal, I Fariás, L Marz, J Merkel, S Mützel, M Oppen, N Schulte-Römer and H Straßheim (2010) 'Research Program of the Research Unit: "Cultural sources of newness"'. WZB Discussion Paper (SP III 2010-405): <http://bibliothek.wzb.eu/pdf/2010/iii10-405.pdf>
- Huxley J (1955) 'Guest editorial: Evolution, cultural and biological'. *Yearbook of Anthropology*, 2-5.
- Kauffman S (2000) *Investigations*. Oxford: Oxford University Press.
- Kenway J, E Bullen, J Fahey and S Robb (2006) *Haunting the Knowledge Economy*. London: Routledge.
- Konner M (2010) *The Evolution of Childhood: Relationships, Emotion, Mind*. Cambridge MA: Harvard University Press.
- Kull K, T Deacon, C Emmeche, J Hoffemeyer and F Stjernfelt (2010) 'Theses on Biosemiotics: Prolegomena to a Theoretical Biology'. *Biological Theory*, 4:2, 167-73.
- Leadbeater C (2014) *The Frugal Innovator: Creating Change on a Shoestring*. London: Palgrave Macmillan.
- Leadbeater C and A Wong (2010) *Learning from the Extremes*. Online: Cisco Systems: http://www.cisco.com/web/about/citizenship/socio-economic/docs/LearningfromExtremes_WhitePaper.pdf
- Lee RE (2003) *Life and Times of Cultural Studies: The Politics and Transformation of the Structures of Knowledge*. Durham NC: Duke University Press.
- Lotman Y [J.] (2009) *Culture and Explosion*. Berlin: Mouton De Gruyter.

- Luhmann N (1991) 'What is Communication?' *Communication Theory*, X: 251-9.
- Luhmann N (2012) *Theory of Society, Vol. 1*. Stanford CA: Stanford University Press.
- McCloskey D (2010) *Bourgeois Dignity: Why economics can't explain the modern world*. Chicago IL: University of Chicago Press.
- Mesoudi A (2011) *Cultural Evolution: How Darwinian Theory can Explain Human Diversity and Synthesize the Social Sciences*, Chicago: University of Chicago Press.
- Miller T (2000) 'Hullo Television Studies, Bye-Bye Television?' *Television & New Media* 1(1), 3-8.
- Miller T (2004) 'A View from a Fossil: The New Economy, Creativity and Consumption – Two or Three Things I Don't Believe in'. *International Journal of Cultural Studies*, 7(1), 55-65.
- Nowak M (2006) 'Five rules for the evolution of cooperation' *Science*, 314 (5805): 1560-63.
- Nowak M. (2011) *Supercooperators*. Free Press: New York.
- O'Connor J (2010) *The cultural and creative industries: a literature review* [2nd ed.]. Newcastle-Upon-Tyne: Creativity, Culture and Education.
- Pagel M (2012) *Wired for Culture: The Natural History of Human Cooperation*. London: Allen Lane.
- Potts J (2000) *The New Evolutionary Microeconomics: Complexity, Competence and Adaptive Behaviour*. Cheltenham: Edward Elgar.
- Potts J and S Cunningham (2008) 'Four models of the creative industries' *International Journal of Cultural Policy* 14(3): 233-49.
- Potts J and J Hartley (2014) 'Toward a new cultural economics of innovation' Paper presented at *International Association of Cultural Economics conference (IACE)*, Montreal, June 2014.
- Schmidt K (2010) 'Göbekli Tepe – the Stone Age Sanctuaries. New results of ongoing excavations with a special focus on sculptures and high reliefs'. *Documenta Praehistorica*, 37: 239-56: http://arheologija.ff.uni-lj.si/documenta/authors37/37_21.pdf.
- Sinfield A (2004) *Literature, Politics and Culture in Postwar Britain*. Rev. edn. London: Continuum.
- Stark D (2009) *The Sense of Dissonance: Accounts of worth in economic life*. Princeton NJ: Princeton University Press.
- Turner G (2012) *What's Become of Cultural Studies*. London: Sage Publications.
- Veblen T (1899) *The Theory of the Leisure Class*. Online: Project Gutenberg.
- Vedres B and D Stark (2010) 'Structural folds: Generative disruption in overlapping groups'. *American Journal of Sociology*, 115:4, 1150-90.
- Williams R (1958) 'Culture is Ordinary'. Reprinted in B. Highmore, ed. (2002) *The Everyday Life Reader*. London: Routledge, 91-100.
- Williams R (1977) *Marxism and Literature*. Oxford: Oxford University Press.