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Newness

Innovation

The process of innovation is paradoxical, for it involves a curious cognitive function of recognizing what is not yet formulated as a category. . . . It is only in the process of attempting to make a transformation in the world that new problems can even be formulated. Generating novel recombinations is itself a kind of production requiring coordination and cooperation across different communities.

Vedres and Stark 2010: 1157

The Janus face of culture

Janus was a Roman god; the Greeks had no such deity. Janus was the god of beginnings and transitions, of change and time. He was depicted with two faces, looking simultaneously forward and backward, to the past and to the future. The theme of past and present is perennial and philosophic, to be found in every religion. But it carries with it the grittier theme of the old and the new; renewal, certainly, but also death or destruction.

Culture too is Janus-faced. It looks forward to new possibilities and to the future, and also backward to the past at what is old, some of which will be canonized as classic. A filter is at work here, where most of the past is discarded through critical assessment: it is wasted (as in the next chapter) by passage of time. Forward-looking culture is found in avant-garde performance, in experimental music, in the small tents at festivals and in some pop culture. Past-looking culture is found in museums, in the big tents in festivals, and on school curricula. Forward- and backward-looking cultures together make a cultural present. But the balance of these two is what matters.

Like Janus's conjoined faces, forward- and backward-looking cultures coexist in close proximity, separated by watersheds, subtle or vertiginous, whether in time or space. Back in the 1990s, the discombobulating jump from the end of TV music show *Rage* at 9 a.m. on Sunday mornings (i.e. extra-late Saturday night), to *Songs of Praise*, used to leave one of us with temporal whiplash. Similar experiences on the spatial plane can be had in walking about certain parts of London, Berlin or Beijing – the old and new clash noisily. At other times these boundaries are ruthlessly policed, seeking to expel all traces of the old from their midst (think of Left Bank Parisian artists in the *bonne époque*, for instance), or in the pristine traditionalism that is classic when done by the elite (e.g. authentic-instrument music), but kitsch when adopted by the masses ('the good old days').

Our issue here is not with a valuation of the past – that is, with a cultural critique of the classics – but with the forces that construct a sociocultural system through time. The problem arises not because of the reproduction of culture – for that is essential – but in the way that the same cultural 'operating system,' which is 'installed without our consent' (Pagel 2012), treats novelty and newness or its ability to generate novelty and newness. The value of newness is in the pathways it offers to the future. But this same novelty is what threatens the values of the past. An effective cultural reproductive system will therefore be well inoculated against newness. It will reject it, in the first instance, because such changes will threaten what is currently valued and known to be good. But an evolutionarily effective cultural system that seeks to live in a changing world, whether that change comes from the environment or from competition with 'they'-groups, will also be able to adapt to changes. That adaptation capability will depend on the cultural system's capability to develop new ideas. Novelty and newness will be the mechanism by which such adaption occurs. Cultures 'know' this at the level of stories, and have done so for thousands of years. They work through the conundrum with myths about how knowledge has to be stolen from the gods by a Trickster (Hermes; Prometheus), a necessary act of renewal that changes the relationship between gods and humanity forever (Hyde 2008); and about how the capacity of humanity to attain new knowledge eventually (after about 15 hours in Wagner's case) spells the twilight of the gods (*Götterdämmerung*).

The production of novelty and newness is not important because it is aesthetically sublime or Romantically agonistic, or because it reflects human perfection, as Kant said and others have since implied (Arnold, Ruskin, Keynes, Bloom 1998, et al.). It is important simply because it is needed for survival. We

need new ideas to live in a changing environment. That is an evolutionary social imperative, not an aesthetic cultural one. Cultural novelty is of value because it provides us with new ways of thinking, which in turn enable us to think in new ways.

Not all cultures (demes) can generate or sustain novelty. They are threatened by it, for new ideas are untested and potentially destructive of the existing order. In an unchanging world, novelty is pure uncertainty and risk. But in a changing world, whether it is the environment or 'they' who are doing new things, new responses are required. They come from either a trust in the powers of visionary leaders to see what needs to be done, or they come from what complexity theory calls 'bottom-up' solutions that percolate from the variety and novelty generated within the system. The premise of cultural science is that these bottom-up solutions – this variety generated from within the system – are the only solution concepts that matter. This is novelty, or variety in the evolutionary scheme, and it is the grist upon which selection mechanisms then operate. This is rightly and insightfully how evolutionary cultural theorists in anthropology and sociology see this world (Mesoudi 2011). Cultural science seeks to build on these insights of the origin of newness.

The dynamic scale of cultural change

There is a scale to novelty and newness. Novelty doesn't matter at any particular moment in the present. Creativity, novelty, newness and innovation are not really essential or even important in people's lives on a day-to-day basis. Most of what we think and do is copied, conventional and routine, which is as it must be if we are to function at all. A random sampling of human history at any point from the Pleistocene age to the present, anywhere in the world, over any particular grouping of people, would statistically yield the result that 'nothing much happened'. Any real-time randomly sampled history will be tedious precisely because it is the play of existing ideas. New ideas are rare in actual history. They are the reason that historiography is constructed about new ideas, or the people that propose them.

Yet, here's the thing: in the long run, across human history and prehistory, creativity, novelty, newness and innovation are really the only things that matter. They're like genetic mutations in evolution, in that while you mostly don't notice them, they're all that count in the long term. In 2009, scientists at the Wellcome

Sanger Trust estimated that you've probably got 100–200 mutations that your parents didn't have. That's not so many across the billions of alleles in your genome, and unless you are extremely unlucky, you'll have no idea that they are there. Yet over eons, these mutations (interacting with selection, of course) are the reason that you're not a slime mould, or a ring-tailed lemur. Analytically, cultural 'mutations' should be viewed similarly.

Creativity, novelty, origination, newness and innovation in culture are like this. Up close, day-to-day, novelty doesn't really matter because most culture as it is practiced and experienced – high culture and ordinary culture alike – runs through well-rehearsed scripts and routines. We are already familiar with most of the music we listen to, in timbre or genre if not in exact lyrical form. Most of the foods we eat we have eaten before. Most of the ideas we think with are domesticated workhorses within our deme. Robert Hughes' (1991) 'shock of the new' is a rare event, which is why it matters.

The thing about the rare mutation – the new idea – is that it will affect not just you, but all who follow in your deme. For example, you might digest lactose slightly better than your parents; or you might calculate the area under a quadratic equation with greater accuracy than your teachers; or see a connection between African death masks and European portraiture. The point is that so too might all of your demic descendants who adopt your idea. It is the implication that this change can be copied or replicated through potentially vast scale to become a basis upon which further changes can then be made that makes newness (as opposed to mere novelty) seemingly mundane up close, but so profound at a distance.

In cultural science, the cultural significance of newness is not an inquiry into the causes of artistic genius or aesthetic vision (Boden 1990; Simonton 1999; Galenson 2008). It is, rather, an inquiry into the process by which a new idea is recognized and then adopted and diffused through a population, and the process by which that demic (or meso) population then retains that idea (Dopfer and Potts 2008). Joseph Schumpeter (1942) called this process 'creative destruction'. We call it 'demic newness'.

There is no singular science of novelty. Rather, from biochemistry through the evolutionary, behavioural and social sciences and the humanities there are different approaches to the theoretical conception of novelty and newness. These can be seen in the different concepts used to describe or reference novelty through mutation, variation, variety-generation, origination, creativity, imagination, newness, discovery and innovation, among others. We will trace these out in

order to highlight an overarching pattern of three distinct approaches, the third of which we associate with the cultural science approach to novelty in the form of demic newness. Our goal here is to show how we get from: (1) a biological science conception of novelty – from determinism to *randomness*; (2) through a behavioural and social-science conception of novelty – from systems to individual minds, or *consciousness*; to (3) a cultural science conception of novelty – from individuals to *demes*. Each level supervenes on the previous.

Randomness makes variety

The Laplacian/Newtonian world-view of classical physics is exemplified in the field-theoretic formulations of rational mechanics. In this world, all particles exist in a space-time continuum of universal force fields. In principle, if you know the position and momentum of every particle you can calculate the entire future history of the universe. This type of extreme determinism shows up in social-science models based on rational mechanics, such as both neoclassical economics and Marxism (Potts 2000). What is missing is randomness (Herrmann-Pillath 2013).

Randomness entered physics through thermodynamics – the entropy law – which posited an arrow of time with the tendency of all closed systems to run down the entropy gradient from order to disorder. Here randomness is entirely destructive. Modern physics emerged through quantization, which had at its core quantum indeterminacy, or the fundamentally unknowable state of nature at the level of a quantum particle. Here randomness is ontological. Modern information theory (developed by John von Neumann and Claude Shannon) emerged with the recognition that communication requires randomness embedded in a message. Here randomness is constructive.

Darwinian evolutionary theory is also built on randomness, in the form of the first of the three constitutive mechanisms of variation, selection and replication. The fuel of evolutionary selection is the variation in a population, and thus for the evolutionary mechanism to continue to function there must exist a variety-generation mechanism. There are several, including random mutation in an allele, sexual recombination, which involves the random mixing of two chromosomes. The idea that randomness generates variety, and that variety is discovered or revealed by random or quasi-random movements within a space (a field, a population or a system) is the first of our theories of novelty.

A subsequent evaluative mechanism (e.g. natural selection) then values that new point in space, leading to differential replication. This class of model is very abstract and can be applied over a very wide domain, from genetics to machine learning algorithms.

Once we can see this as ‘random movement within a space’ we can further identify this as ‘search’ and then appreciate how a further mechanism can be added, in the form of investment. A system or population will devote some fraction of its resources (time, energy, workers) to investment in search. This is expressed in its most abstract form in modern economic growth models of research and development (R&D) investment (Romer 1990). For any given system-environment ensemble, there will be an optimal investment in the generation of variety.

Machine learning and artificial intelligence have an analogous need for variety-generation that is then subject to selection and replication. The model is lifted directly from biological analogy mixed with random number generators to arrive at a complex mix of computational iteration using stochastic variation. These models are algorithmic, grinding away to produce continuous streams of novelty that become grist for the mill of a selection mechanism. In these situations, creativity and novelty are essentially reduced to random variation about known solutions and the use of adapted heuristics to create variation from existing solutions. This model is also widespread in the social sciences, especially in economics, where the Schumpeterian entrepreneur is the variety-generation mechanism, searching or experimenting in the space of value-creating propositions, and the market mechanism is the selection process. It is in this sense that biological evolution (Campbell 1960), economic evolution (Schumpeter 1942; Nelson and Winter 1982), technological evolution (Arthur 2009), and the sociological version of cultural evolution (Mesoudi 2011) are all homologous in the equivalent form of a mechanism of variety-generation coupled to a mechanism of selection.

It is important to appreciate that these models of variety-generation as random motion (in a space), coupled with post hoc selection for high value movements (in that space), are actually models of search, not of creativity. To call variation a ‘creative process’ is a metaphor. Specifically, these models do not account for the higher order conjectural processes at work in human creativity that rely on the creation of ‘models of the world’ as the space in which creativity operates before being translated into real world contexts. As Kant pointed out long ago, we do not interact directly with pure sense data but through interpretations that attach meaning and significance. Creativity operates through

these constructions. This is why an evolutionary cultural science approach to creative novelty cannot proceed from a variation-based model of creativity.

Consciousness makes creativity

In the modern scientific conception, randomness is a foundation of the universe and of life. In the modern Romantic conception, creative agency is the foundation of the individual. This is a different formulation, centred on the free will of agency (compared to the deterministic will of God, say, or fate) in which the human being is capable of making choices, requiring of them some conscious mechanism of imagination, or creativity. This conscious class of model is essentially (and methodologically) individualistic, supposing an intelligence, perception and imagination centred about an agent in the world. It is humanistic and Romantic, and well removed from the deterministic particle of classical physics or medieval theology, because it builds about the study of creativity in the individual human being, whether as *H. sapiens*, or as a more abstracted social agent. This can be observed in the many special treatments of creativity in neuroscience, cognitive science, behavioural and social psychology, design studies, organizational and management theory, education theory, arts and literature, history and philosophy (Boden 1994; Csikszentmihalyi 1996; Simonton 1999).

These models link novelty and newness in the world to creativity in the individual human agent. Creativity is not random variation in a space, as in the previous definition of variety, but is closer to a process of making new connections between things, and thus a filling in of the field space of the world, rather than a motion in the world's space. The creative agent adds to the content of the world by re-forming it, or imagining it, in new ways. Creativity is a subset of adaptive intelligence proceeding from imagination through to the realization of novel objective forms, solutions or products. It is subjective cognition and experimental action that results in objective difference. Creativity is an individual act (of insight, of genius) that makes the world different.

In neuropsychology and behavioural psychology creativity and novelty-generation separate into two distinct modalities: that internal to the agent (mental properties) and those relating to agent–environment interactions. Internal models emphasize experience and time devoted to problems, and the ability to recombine aspects of one problem space to another through framing and analogical reasoning, which involves creativity as a kind of imaginative

leveraging of knowledge (Boden 1990). These explanations load on general cognitive capacity, whether fast and intuitive or cumulative and experiential. Csikszentmihalyi (1996) proposes a theory of creativity based about what he calls 'flow', which is in effect a type of all-absorbing concentration in which the person becomes absorbed into their intense effort in an ultimately satisfying way. Creativity is a result of skilled behavioural abstraction and concentration.

In the consciousness model of novelty, creativity comes from the intelligence and imagination of individual human minds. Creativity is promoted by conditioning these individual minds, directly through training or indirectly through attention to the environment in which they operate. This model is so widely adopted, both formally and in the implicit framing of questions and problems, that we might as well call this the 'standard social-science model of novelty'. It argues that novelty is generated by individual minds (as creativity) and that this is affected by the conditions of the individual (intelligence, knowledge, experience, genius), and by the organizational and institutional environment in which that individual acts. Education and organizational theory favour the environmental side of creativity, supposing that all people (including children) are inherently creative and that the expression of creativity is a consequence of environmental, organizational or institutional enablers. Both of these are 'control' parameters, in that creativity can therefore be dialled up or down by investment in individual 'creative human capital' or by manipulation of the individual's organizational and institutional environment. The work of Edward de Bono (1985) on individual creativity and Richard Florida (2002) on institutional creativity are two poles that exemplify this model.

The standard social-science model of novelty is widely entrenched, with good reason. It makes sense of individual creative actions and propensities, and it defines institutional (and therefore political) control mechanisms. It fits well with the standard social-science model of methodological individualism and with the standard policy model of institutional incentive design. Yet there are problems. In following the imperative of methodological individualism in assuming that novelty comes from individuals (because individuals are the locus of choice), it also assumes that knowledge resides in individuals. Cultural science departs from this with the principle of externalism (Chapter 2), and the knowledge unit of a deme (Chapter 3), which returns here as the unit of creativity.

Furthermore, both the random model and the Romantic model are agnostic and doctrinaire about the identity of any novelty. They make it axiomatically obvious. This is a point about which cultural studies is highly sceptical – as framed through such concepts as 'social construction of' and 'contested meanings', but

the real import is that novelty does not arrive with labels. What counts as a new idea is the result of a process of collective evaluation or emergence. Obviously there are individuals who propose and champion any particular novelty (an entrepreneur, for instance), but the process by which a novelty is identified and constructed remains unexplained in the standard social-science model.

For example, consider the value of copying. High modernist theories of novelty and creativity see the value of creativity in the creative production itself, not in the subsequent adoption or copying processes. But simple economic logic implies that value is created in adoption and copying (discussion of rights and property is really about the distribution of the surplus value created by that joint process). The value of a creative act is revealed by the extent of adoption and copying processes that follow. It is the deme of an idea that determines its value, not the originator.

The cultural science model of novelty does not discount or reject the random model of novelty as variation (subject to selection) or the Romantic model of novelty as individual creativity. It seeks to incorporate both these perspectives. They are both parsimonious explanations (the principle of Occam's Razor is satisfied) and well supported by empirical evidence. What the cultural science approach seeks to do is to develop them to the next level, as it were, by recognizing what they constitutionally fail to account for: namely externalism, meaningfulness, demic knowledge ('we'-groups), conflict, scale, waste and extinction (as further developed in Chapters 8 and 9). The upshot is an account of the creative source of novelty lying not in the tidy abstractions of individual or in society, but in the messy new cultural science concept of a deme (or 'we'-group), which is an externalized unit of knowledge, and what we think of as the main cultural carrier and progenitor.

Demes make newness

Cultural newness arises from within a deme. This is an externalized process of discovery and negotiation of new meaningfulness through the tensions of 'we'-group interactions with 'they'-group boundary conditions. Randomness (or generative waste) and Romantic individual imagination and creativity are obviously involved in this process. But the central cultural science proposition is that the creation of newness occurs at the level of the deme; it is *demic*.

After the classical theory of randomness as search in a space, and the modern theory of novelty as individual creativity in an institutional environment, comes the postmodern conception of novelty as demic newness. Culture produces

newness and innovation through externalist, demic and wasteful mechanisms (Chapters 2, 3 and 8) that result in explosions and extinctions (Chapters 6 and 9). The classical and modernist view is that creative individuals (as a kind of random particle) produce novelty and that institutional mechanisms select over this. Culture is the result of this process. But the postmodern cultural science approach is that culture itself produces knowledge and meaning because of its generative capacities in producing complex spaces that bring freedom and tension into balance.

Cities, for example, can produce novelty through their assemblage of ideas and tensions. Democracy can produce novelty through its 'we-group/they-group' intermediation. Journalism can produce novelty through positing and mediating knowledge clashes ('both sides of the story'). The canonized artists of the Renaissance (Michelangelo, et al.) were not artists at the time: they were artisans and entrepreneurs who created new sources of meaningfulness. They had artistic talent to be sure, but that is not why we know them. Mostly, we don't care about the extent to which their works were done by apprentices; and we don't know the work of their talented contemporaries. Shakespeare was a brilliant entrepreneur, as well as a writer. His Globe Theatre project was the original model for venture capital in cultural production, in that his company was one of the earliest joint stock ventures, creating new audiences for popular entertainment (Hartley 2013). The origin of the cultural juggernaut of Australian Indigenous art is in significant part thanks to a New Yorker called Fred Myers (2002), who intermediated and constructed the meaning of these works for other demes, and thus established their value in the international art market. The genius of Damien Hirst, Jeffery Koons and Andy Warhol is as much in marketing as making. This takes nothing away from their artistic talent but does go towards explaining their significance (Lanham 2006). Culture produces newness by intermediating in a world of cultural abundance that as a mass experience really is a new and epochal phenomenon (Hoggart 2004).

The properties of a deme that contribute to the discovery of newness and the production of innovation emerge from how it sets up freedoms and deals with conflict. It is with how it puts people together and manages the chaos that may ensue in a way that enables good ideas to circulate (McNair 2006). The more the folkways and institutions of a culture function like a common pool resource, the more effective they will be in generating novelty and in driving innovation. In this respect, a good model of culture-driven demic innovation comes from the study of creative commons and knowledge commons, which builds on the work of Elinor Ostrom (1990) in relation to the governance of natural resource

commons. A commons is a space where a group of people interested in an idea (i.e. a deme) can create or manage a resource of value. The overarching finding from research on successful commons is that it attributes good outcomes to good rules, not to good people. Good rules (along with good stories: Chapter 3) make viable demes. This is a template for cultural science.

The economic sociology of newness: ‘Irritating impact’

Michael Hutter and his colleagues (2010) explain that:

We understand newness as a concept denoting events, products, ideas, technologies, works of art, and processes of collaboration or coordination that have an irritating impact when they occur.

This view of novelty and innovation as *newness* is a different concept from novelty in the previous models (as variety or creativity). Newness here is hard and unloved. Newness comes from an outworking of tensions, frictions, dissonance, ambiguity and problems that eventually reveal new possibilities or opportunities to be seized and exploited to create or extract value.

The model of newness has been developed in economic sociology by David Stark at Columbia University and by Michael Hutter and his team at WZB Berlin.¹ At the heart of their approach is the idea of multiple value propositions, or what French sociologists Luc Boltanski and Laurent Thévenot (2006) call ‘orders of worth’. They elaborate a sociological theory of value framework of six orders of worth – civic, market, inspired, fame, industrial and domestic – that applies in all calculative economic situations. David Stark builds on this, using the concept of ‘structural folds’ proposing a new model of novelty-generation and entrepreneurship based on the *dissonance* or frictions that occur between multiple evaluative criteria of worth, specifically emphasizing the notion that these dissonances can be and often are deliberately set up (Vedres and Stark 2010).²

Stark (2009: 15) explains that, ‘Entrepreneurship is the ability to keep multiple evaluative principles in play and to exploit the resulting friction of their

¹ WZB: Wissenschaftszentrum Berlin für Sozialforschung. Social Science Research Centre Berlin.

² Stark (2009) *The Sense of Dissonance*, conducts ethnographic analysis of organizational contexts in three situations of organizational ‘heterarchy’ (a socialist factory, a new media start-up and an arbitrage trading room) in each case finding that the key driver of entrepreneurial discovery is the tensions and frictions or the dissonance created by the interplay of different evaluative criteria of worth.

interplay'. He argues that this type of innovation is not 'search' in the planning and engineering sense above, but is closer to a process of 'search when you don't know what you're looking for, but will recognize it when you find it'. Spatially and structurally organized dissonance can contribute to the discovery and realization of entrepreneurial opportunities. This is modelled with the concept of 'structural folds' (Vedres and Stark 2010), contrasted with Ronald Burt's entrepreneurial brokerage concept of 'structural holes'. In Stark's model, organizational dissonance is the mechanism that underpins how creative friction yields organizational reflexivity to create an 'ecology of knowledge' in which multiple and potentially conflicting evaluative principles and criteria of worth are in play and are entrepreneurially resolved into singular assessments of value (Stark 2009: 142). Newness emerges from the resolution of conflict of multiple overlapping evaluative criteria to arrive at a singular value judgement.

Michael Hutter's research group (Hutter 2008, 2010, 2012) have been working along a similar line with a raft of projects organized about the theme of 'cultural sources of newness', in which:

Newness lies at the core of innovations and emerges in cultural sources, which are analyzed as cultural configurations [or] cultural constellations. (Hutter et al. 2010)

Referencing the work of Boltanski, Thévenot and Stark, but building on this in the direction of ethnography and cultural geography as well as evolutionary economics, the WZB group argue that three kinds of processes are decisive for innovations:

- The continuous variation of cultural forms and practices;
- The evaluation of newness;
- The states of tension that arise within and between cultures.

Their approach thus emphasizes that innovations are neither obvious nor attributable to individual creativity, both statements that are near axiomatic in the standard random or Romantic approaches; but instead that newness is a cultural valuation process that is associated with particular constellations of cultural configurations in respect of proximity, collaboration, communication and meaning; an externalized meaningful deme, in other words. Furthermore, this is not a causal process in which culture is the input and novelty is the output. Rather, these cultural configurations – dissonant tensions and frictions in Stark's sense – create opportunities that may then be entrepreneurially recognized and acted upon. This is not unlike the economist Israel Kirzner's (1973) conception of

entrepreneurship as ‘alertness to opportunity’. Novelty and innovation *supervenes* on culture through the simultaneous creation of newness and opportunities.

Cultures do not generate newness as a property of a given culture as a whole, such that we may speak of that culture X being innovative and culture Y being less so. This is a fallacy of aggregation, where we suppose that because we may speak of individuals being creative or intelligent, we may speak likewise of cultures. Cultural sources of newness refers to cultural processes and constellations of cultural interactions that generate the necessary frictions, tensions and dissonance, usually across overlapping value propositions, or *meanings*, such that a deme identifies newness in the opportunity created and worth in the value that can be resolved.

This process may not even look or feel creative and innovative. As a site of tension, complexity and bricolage, it will likely be discordant, uncomfortable, problematic, challenging and unresolved – recognizably *wrong*. It is a cultural space in which alertness to opportunities to resolve such tensions can be a source of advance and a place where surprise is expected (Shackle 1972). This is an environment in which experimentation works as a discovery method, and where the act of play – of trying things out in a somewhat unstructured way – may be effective.

It is also an environment with benefits to heterogeneity, proximity, mixing and scale – cosmopolitan urban environments of the city, in other words, where ideas can run into each other, where accidental connections can take place, where opportunities are created and recognized. Social networks and novelty bundling markets (Potts 2011) are culture constellations that put ideas together in ways that create tensions and stresses that need to be resolved and in so doing create spaces and environments in which opportunities are revealed. This is how a deme produces innovation. It suggests a reinterpretation of the work on the economics of cities as sites of creativity and innovation. Richard Florida (2002, 2005) has been at the vanguard of the human capital model of creative cities, in which creative cities are the result of attractors for creative people. Currid (2007) focuses this argument on the cultural and creative scene, as a competitive advantage for some cities, which is closer to the meaning we are advancing here, in that she is emphasizing the edginess and the social and fashion scene as a key part of the mechanism (Aspers 2010).

Yet, the cultural science line of argument is perhaps closest to Jane Jacobs (1961, 1984) or Ed Glaeser (2011). Jacobs argued that cities work worst when they are extensively planned, rationalized and driven to exploit economic scale in single sectors, and work best, in the sense of being the most robust,

the most capable of growth, when they evolve organically by ever increasing the complexity of their economic base. Nassim Taleb (2012) would call this property 'anti-fragile' rather than robust, in the sense that Jacob's cities actually gain from stressors and disorder rather than just being robust against them. In policy terms, Jacobs was against the developmental model and top-down planning and favoured mixed-use development and bottom-up planning; in essence the abolition of zoning laws. We also favour these ideas and see them as sources of value and growth (Hartley et al. 2012), because they organically generate the types of dense urban cultural ecologies that are conducive to the generation and realization of opportunities via demic concentration.

What do these cultural constellations need to make an 'irritating impact', whether at the scale of cities, or in the form of smaller clusters, local scenes, associations, or any other social form? We argue two basic properties are necessary: social networks and freedom. Social networks create the space and flows of information between people to enable these tensions and conflicts and dissonances to form (i.e. be communicable) in the first place. Freedom works towards ensuring that they don't then cause the system to overheat, blow up or destroy itself.

By *social networks* we mean any technology that enables coordination to be achieved by the sharing of information across a network. Clay Shirky (2008) and Charles Leadbeater (2008) have argued that the very nature of innovation and creativity is changing because of changing opportunities brought by opportunities that operate across social networks. For Shirky, what has changed is the lower Coasian 'transactions costs' of coordination and organization that make it possible to do things collectively on social networks that previously were far too costly or difficult to coordinate (Potts 2010). A dramatic fall in the costs of coordination impacts on the social network by driving the explosion of mass collaborative creativity. Leadbeater (2010) emphasizes the revolution in the opportunity space to share and collaborate in innovation and production using social media technology (Quiggin 2006). As for *freedom*, McCloskey (2006, 2010) explains that these are the core freedom principles underpinning capitalism.

It is not that newness per se is socially constructed, or that a particular novelty or innovation is a social construction, at least, not in the critical sense argued by Ian Hacking (2000). Rather, the very possibility of newness, novelty and innovation is constructed by particular cultural contexts and situations that enable ideas and meanings to interact in ways that create potential new opportunities that are brought into existence in a cultural context.