



Economies of repetition: anthropology on the cultures of innovation

Alberto Corsín Jiménez
University of Manchester

resumen

El artículo analiza el concepto de innovación y su impacto en la teoría social. En concreto, el trabajo se centra en la forma en que la innovación requiere una yuxtaposición y equilibrio de las categorías sociológicas (conocimiento, economía, sociedad) que configuran su existencia en sus orígenes. La innovación ejerce el papel de todo y parten de la descripción sociológica de la sociedad tecnocientífica del siglo XXI. En este sentido, la investigación arroja luz sobre cómo las descripciones antropológicas de las prácticas académicas y científicas facilitan procesos innovadores que no colapsen con sus propios objetos de descripción. Todo ello sobre la base de un “constructo” concreto del cambio social: la organización de la ciencia e investigación en torno a la producción institucional de la repetición como forma de innovación.

abstract

This paper explores how the concept of innovation fares in, and what does it do to, our social theory. In particular, I am interested in the way the notion of innovation demands the playful juxtaposition and balancing of the sociological categories (knowledge, economy, society) that call for its existence in the first place. Innovation plays the role of both part and whole in the sociological description of 21st century technoscientific society. In its stead, the article provides some glimpses of how anthropological descriptions of academic and scientific practices allow for accounts of innovative processes that do not collapse their own objects of description. I draw inspiration to this effect from one specific instance of social change: the organisation of science and research around the institutional production of repetition as a mode of innovation.

palabras clave

Innovación
Antropología
Economías de Repetición
Conocimiento
Sociedad

keywords

*Innovation
Anthropology
Economies of Repetition
Knowledge
Society*



There is a famous passage in Dostoevsky's novel, *Notes from the Underground*, where the main character undergoes a moment of self-revelation, a revolutionary moment of self-discovery, in which he realises that the structure of caste society in post-Crimean War Russia (Dostoevsky is writing in the 1860s) contains crevices and fractures, fleeting and elusive openings that hint at what a classless society might look like. The passage in question refers to a decision taken by the Underground Man to stand up against an officer in The Nevsky Prospect, the most public of urban spaces in Petersburg. The Underground Man has made a decision not to step aside, not to budge an inch when walking past the officer in the street. Our protagonist has realised that the possibility for a new society evinces in the public character of street life and has made a decision to keep thus his dignity, to claim his right to equality, by not retreating an inch as his and the officer's paths cross roads.

Marshall Berman, who has commented on this particular scene in Dostoevsky's novel, has suggested that the episode dramatizes the struggle for modernisation in mid-19th century Russia (Berman 1988 [1982]: 219-235). For Berman, the aforementioned passage vividly exemplifies the rise of a New Man in Petersburg, the coming-into-light of a hitherto underground man: 'groups of anonymous and ordinary people, of people full of weakness and vulnerabilities, torn by fear and self-doubt and ambivalence, but willing at crucial moments to go out into the streets and risk their necks to fight for their rights.' (Berman 1988 [1982]: 235) However, Berman cautions against any simplistic reading of Dostoevsky's analysis of the (already decaying) feudal structures of Russian society. Dostoevsky was hardly a reactionary thinker, and his ideas about human development and progress stood in no straightforward relationship with how he thought a society ought to be organised and patterned. For Dostoevsky, there were no social terminal stations that progress and modernity took us to. Much the contrary: Berman's reading of *Notes from the Underground* lucidly shows how Dostoevsky's idea of progress and change is essentially an adventurous one, where the values to be embraced are those of fabrication and movement, of continuous discovery and audacious creation. The New Society is not a place to be reached by social change, but an exploration itself – a journey, not a destination.

Dostoevsky's vision of sociological change as fabrication, as hands-on social transformation, uses 'engineering' as its ideological inspiration. According to Berman, for Dostoevsky the 'primary symbol of human creativity is not, say, art or philosophy, but engineering.' (Berman 1988 [1982]: 242) Engineering is modernity's institutional expression of human action and creativity in its most dynamic form. Engineering is what society does to itself when it undergoes positive change. Berman puts the implications of this with his usual elegance:

The activity of engineering, so long as it remains an activity, can bring man's creativity to its highest pitch; but as soon as the builder stops building, and entrenches himself in the things he has made, the creative energies are frozen, and the palace becomes a tomb. This suggests a fundamental distinction between different modes of modernization: modernization as *adventure* and modernization as *routine*. (Berman 1988 [1982]: 243)

I have decided to open this brief essay with a reference to Berman's insightful reading of Dostoevsky's analysis of the social and technological conditions of modern society because of the simplicity and elegance, I think, with which it brings to the fore and illuminates certain aspects of our contemporary concern with the knowledge economy and with what Helga Nowotny has called the 'quest for innovation' (Nowotny 2007). For Berman – and for Dostoevsky – it is clear that the conditions of modernity stand in no direct relationship to progress or, indeed, to social change at large. Modernity is not about social change, neither is it about technological change. Indeed, there are modes of change (for instance, philosophical arguments) that do not bring us any closer to social progress. Dostoevsky thinks that only a society built on a particular *transformative* orientation will achieve modernity. Said differently, 'society', 'technology' and 'change' are not *proportionate objects* for one another. There is no correlative function between these terms that will procure the modern condition. And whilst it was *adventure* that filled the void of correlation for Dostoevsky, we can argue, with Nowotny, that today it is *innovation* that plays the part of social change. In other words, innovation is to the knowledge economy what adventure was to 19th century modernism.

This may all sound rather pedestrian to us, but it is surprising how often science-policy analysts forget that most simple and yet significant of sociological distinctions, between **what we say** **a sociological object is** and **how we put it to work sociologically**. In the case above we can see that the way the ideal of modernity is put to work sociologically differs from the terms (engineering, social structure and human progress and dignity) which are said to constitute it. Modernity is said to happen if, and only if, these terms are put to work together under the sociological spell of *adventure*.

This essay is concerned with a similar type of sociological spell – the sociological enchantment of innovation. In particular, I am interested in the shape and forms given to 'knowledge', 'economy' and 'science' when forced to work – when held together in a correlative function – under the mantra of innovation. In order to do this, I break up my argument into three parts. First, I provide a sketch of the terms in which the institutional culture of innovation, and the governance of knowledge at large, is largely imagined today. Central to this imagination are the notions of collabo-



ration, interdisciplinarity, social trust and ethics. Next, I provide glimpses of recent fieldwork carried out by anthropologists working on scientific and research institutions, who are attempting to advance ways of thinking beyond the correlative circularity of the knowledge economy. To conclude, I draw briefly on my own work to suggest that there are good grounds for re-describing 'innovation' in terms of an **economy of repetition**. Repetition is the form that the cultural economy of innovation takes when the production of knowledge is at stake.

1. The political culture of innovation

Over the past ten years there has been a shift in the way Euro-American societies conceptualise the place of science and technology in the political landscape. As Nico Stehr has put it, we have moved from thinking about the 'politics of knowledge' to recognising a particular form of 'knowledge politics' (Stehr 2003: 643). The general claim here is that scientific knowledge has turned into an object in need of governance (Fuller 2000) – that calls for a model where the political structures of science are value free and transparent and all that is required from scientists and legislators is to embrace structures of governance that consolidate and replicate an idea of science as a democratic good in itself. There are echoes here of the model of the 'open society' (Popper 1945) and the model, too, of the 'republic of science' (Polanyi 1962), in which science and scientific knowledge are imagined as political objects that can be 'well-ordered' (Kitcher 2001). And against this political background, transparency, trust and social ethics emerge as the central regulatory mechanisms of the culture of science in the new knowledge economy (Corsín Jiménez 2005; O'Neill 2002b; Strathern 2000).

The discussion around the 'governance of science' has sparked in turn a lively debate about the entanglements of science in different national traditions of political economy (Jasanoff 2007); the economics of knowledge and, in particular, the public or communal qualities of knowledge (David 2000; Foray 2006; Stiglitz 1999); and the institutional cultures of research environments, which have undergone important changes in order to help promote a type of science that is interdisciplinary, society-oriented, evidence-based and politically sensitive. We have entered thus, so the argument goes, a new historical phase in the conditions of production of science, one which has come to be known as Mode-2 Science (Nowotny et al. 2001).

Two of the most significant discursive regimes shaping the new political culture of innovation have been 'collaboration' and 'public value' (Nowotny 2005; Strathern 2004). Central to both developments is the idea that innovative science is produced in partnership and association with 'society' – that science is innovative inso-

far as its production is mediated and informed by the intermediation and interventions of non-scientific actors, such as civil associations, NGOs, patients groups or so-called 'third sector' agencies (Irwin & Wynne 1996; Wilsdon et al. 2005). The idea here is to expand the democratic constitution of science in order to address central questions of political ethics over the distribution of rights, justice and fairness in the new economy of knowledge (Irwin & Michael 2003) – to develop, that is, a new 'epistemic pluralism' that engages scientific experts and lay persons on equal terms (Maranta et al. 2003). As Dominic Pestre has recently put it, in a subtly cynical tone, 'because there are no longer any real conflicts of interest of war, and because we no longer have to worry about the redistribution of goods (the free market being the best solution) – the state can fade away and at last allow civil society to auto-organize freely, as it sees fit.' (Pestre 2005: 41).

2. The correlative circularity of the knowledge economy

As we have seen above, a particular notion of 'society' has made an important reappearance in the conception of science as an epistemological and practical endeavour. Whatever 'science' is, and whatever its practice entails, we need to open-up our ideas of scientific production to considerations of political economy and social ethics. This is why Philip Mirowski has recently spoken of the need to develop a programme for rethinking the *political economy of epistemology* (Mirowski 2004) – why the production of Science is today inflected by questions of participation, ownership and appropriation that concern us all.

Whilst the call to open-up scientific activities and programmes to 'society' – the call for developing a new sociological role for science – are no doubt necessary and relevant, there are also important ways in which the science:society::technology:politics equations are virtual and problematic. The correlation between Science and Society is a political fiction as likely to produce epistemological deformations as our previous conception of science as an ivory tower populated by reclusive experts. It remains unclear, for instance, how 'public understanding of science' programmes, scientific citizenship parliaments or participatory processes (e.g. the participation of lay people in scientific experiments) can help bridge the divide between scientists and the so-called public domain. In all these cases Society is still imagined as a thing 'out there', a whole that needs to be disassembled into a body of partial and representative interlocutors for Science. This part-to-whole sociological imagination explains why the political description of the knowledge economy indulges in correlative circularities – because, in this context, knowledge/society/economy work as proportionate objects (now part, now whole) for one another.



A similar argument can be applied to the political use of the concept of 'innovation'. Helga Nowotny has recently shown how the concept of innovation has emerged at the turn of the 21st century as a cultural category whose purpose is to make sense of, and provide lubrication for, a novel balance of forces between our (Western) conception of the technological present and the uncertain light cast on our plural and risky futures. As she puts it, 'innovation embraces the uncertainties inherent in the future' (Nowotny 2007: 4) Innovation, for Nowotny, is how modern technological society describes itself when caught up in the self-circulatory predicament of not knowing what the future will bring. We innovate because there is nothing left for the knowledge society to do at this stage in our historical predicament (Nowotny 2007: 14-15). The point, then, is that 'innovation' fares both as a part and a whole in our sociological descriptions of the knowledge society: what we have to do to become what we (say we) are.

For all of the above, rather than an improved sociological understanding of knowledge/society relations, or indeed of the place of innovation in the cultural economy of science, what we need is a better appreciation of how and when science becomes *productively public*. We need to understand the social and political concerns that scientists deploy in their everyday work as scientists – how they produce society at the same time as they produce science. As Brian Wynne and his associates have put it, 'We need... to shift from noun to adjective, by asking not only: what is the public value of science? But also, what would *public value science* look like?' (Wilsdon et al. 2005: 29)

Anthropologists have long been interested in the conditions of production of science as a practical, everyday activity – what scientists and researchers 'do' when they do knowledge. One of the earliest and most fascinating accounts of collaborative science, for instance, is Georgina Born's monograph on the collaborative work carried out by computer scientists and musicians at the Institut de Recherche et de Coordination Acoustique/Musique, IRCAM, in Paris in the 1980s (Born 1995). Because my space here is sparse, I can hardly do justice to Born's extraordinary ethnography. I shall narrow my remit here to a vignette on the difficulties that behold any effort at turning 'interdisciplinarity' into an artefact of knowledge. To caricature the point: there is too much unacknowledged knowledge in knowing when collaboration becomes knowledge.

IRCAM opened in 1977 as a computer music research and production institute aimed, under the founding directorship of Pierre Boulez, at becoming the world's leading 'progressive' contemporary music institution, an organisation which would help renovate and canonize Boulez's own modernist understanding of musical knowledge. From its inception, interdisciplinarity (or collaboration, as it was called then) figured centrally in IRCAM's organizational struc-

ture. It was Boulez's ambition to bring the collaboration between computer scientists and musicians to bear on the research of music's universal structures: to identify music's basic rules and patterns, and to develop the tools that would allow attuning these structures to the perceptual and psychoacoustic profiles of listeners. Musicians and computer scientists worked together in developing hardware and software tools that would facilitate exploring and stretching the limits of these musical structures, and that would further enable them to synthesize new sounds for compositional purposes.

An example of the complex interfolding of ideas, images and concepts that characterises the weaving together of different traditions of knowledge is provided by Born on account of the descriptions that musicians made of their own compositions. Born observes how musicians' aesthetic imagination was in the most part populated by scientific images and concepts. Of these, biological analogies played a prominent role in musicians' visualization of the structure of musical knowledge. They imported biological models on functions of growth generation, such as the growth of a leaf, or the unity of micro and macro forms, such as the structural homology between an apple and the tree it hangs from, to make sense of the generative growth of their own musical compositions (Born 1995: 166-167). One researcher used 'scientific analogies from genetics and morphogenesis as metaphors for musical forms, and also [made] reference to Thom's mathematics and catastrophe theory.' (Born 1995: 203) The point is worth pressing because it shows how knowledge is rarely the product of linear progressions, nor of simple disciplinary exchanges: musicians resorted to a scientific vocabulary to make sense of their own musical understanding. The point may be rehearsed by saying that musicians' knowledge of music was scientific.

There is a lesson to learn here about the cultural organisation of scientific practice that leads to innovative research. On the one hand, it is important to note that the kind of innovative work developed by scientists and musicians at IRCAM demands first a heavy investment in cultural self-knowledge: musicians and scientists can only make their collaboration fruitful if they understand each other's cultural imaginations; if scientists understand the science that animates musician's comprehension of their own work. This entails no simple exchange of perspectives. It is not enough for scientists and musicians to start working together; not enough for two disciplines to interact with one another. Born's ethnography illustrates the point when it describes the despair expressed by computer scientists at musicians' resistance to delivering commercial outputs (Born 1995: 213-217). Musicians and scientists held different measures and notions of when the process and production of knowledge should be brought to a halt, when it should be turned into a commercial or technological application, or why it should (not) be



allowed to keep flowing, to develop further and produce new analogies and extensions. They each held different conceptions of how knowledge grows, what informs and nurtures the pro-tensions and retentions of knowledge – the internal and external oscillations that make knowledge develop from within and exteriorise itself. We can see why a definition of the work of scientists as ‘interdisciplinary’ or collaborative would in this case seriously fail to capture the complex movements of knowledge in and out of itself.

In place of interdisciplinarity, I shall call the movement that musical knowledge effects in Born’s description of how musicians’ conceive their own learning process, ‘reversibility’. This is a case of knowledge moving in and out of its own analogical descriptions; of knowledge turning inside out (and thus reversing itself) as it tries to grasp and understand its own condition. Another way of illustrating the way the image of reversibility works is to say that ‘knowledge’ spirals unto itself, that it grows by interiorising and externalising, in a double movement, its own process of coming-into-being.

3. Economies of repetition

Unlike other descriptions of how the production of knowledge takes place, the image of reversibility attends to knowledge’s own self-displacements. In his account of how the people working at Cetus Corporation came to discover PCR, Paul Rabinow speaks of the work of scientists in terms of ‘bricolage’: the organisation and promotion of an open, collaborative environment that enabled scientists to take risks in the organisation of production; to embrace changes of direction and level, to look out for non-identical replications and multiplying modifications. In other words, scientists were encouraged to work in an environment that allowed the re-contextualisation of de-contextualisations and enabled, thus, invention (Rabinow 1996: 169)

Like Rabinow’s, the portrayal of innovative science as a combinatorial and emergent process pervades the literature on science studies, and is indeed at the heart of recent programmes promoting the institutional organisation of science in terms of interdisciplinary. As I have suggested above, however, I believe there is a case for paying attention not to science’s exo-applications, its moves and directions outwards (towards other disciplines, other trades, other epistemological practices), but to focus instead on the processes through which scientific practices become themselves; to attend, that is, to science’s own internal displacements, to its reversible movements.

Paying close attention to how science becomes its own requires, no doubt, a keen eye for repetitive and meticulous practices. For

all science is built, in the last instance, upon an institutional economy of repetition: of tests and trials that are repeated time and again; of times and spaces that are always deployed and displayed in identical fashion; of scientists that repeat other scientists experiments, to build upon them, to prove them wrong, to bring their own science forward in a new direction.

I would like, in this sense, to provide a brief description of two distinct economies of repetition that I have recently been researching. This work builds on two periods of fieldwork where I have been studying and documenting what people do when they ‘do’ and manage knowledge. Last year I spent just over twelve months (June 2006-September 2007) doing fieldwork among philologists and historians of science at Spain’s National Research Council (Consejo Superior de Investigaciones Científicas, Spain’s equivalent to France’s CNRS). In September 2007 I moved to Buenos Aires, invited by an international consultancy company to join a team of management consultants to work on designing the ‘knowledge environment’ (i.e. to design a new building) for one of the world’s leading oil companies.

Whilst I believe that the production of knowledge at both CSIC and the oil company demanded the setting up of an economy of repetition, the way in which ‘repetition’ was deployed and effected in each setting varied significantly. I distinguish two modes of repetition in this respect: ‘whirlpools’, at work in the oil company; and ‘reversibles’, at work in CSIC.

We have already encountered an example of reversibility in Born’s account of musicians’ conception of their own musical knowledge. I do not have the space here to provide a full account of how reversibility manifested itself in the work of historians of science and philologists. Briefly, let it be said that reversibility provides an institutional vehicle for scholarly reflexivity: a means for academics to situate culturally and socially their own productive activities. An economy of reversible repetitions describes a situation where claims to knowledge demand the visibility of its production; that is, where knowledge and scholarship (i.e. laboured knowledge) re-verse upon each other.

As for an economy of whirlpool repetitions, this is characterised by the organisation of production around the spiralling-up of novel arrangements and proposals. This is certainly the case of the work I have done among management consultants in Buenos Aires, where our programme for a self-declared ‘innovative’ management culture crops up at every juncture, in every meeting, in every document and conversation. I would almost caricature my work as a ‘knowledge manager’ as simply that of someone who repeats, time and again, the very same word (innovation) and the very same message. For example, for just under three months I had 32 meetings

with senior board managers, where I rolled out and talked over the same Power Point presentation; paused, explained and elaborated on the same points; and cross-referenced each meeting to previous meetings, assuaging board members that what they were being told had been heard and approved by other board members in previous meetings. Moreover, the Power Point presentation itself took one month and seven people to prepare. We produced over ten versions of the same presentation, making changes so subtle and nuanced that ultimately no one except ourselves were capable of identifying - and which certainly went unnoticed to the board members themselves, who were unfamiliar with the document. We may therefore say that in a whirlpool economy the claims to knowledge demand the invisibility of its production, because in this context knowledge is seen to grow the larger the vacuum around its conditions of production.

To conclude, in this paper I have delineated the cultural economy of innovation that characterises our modern technoscientific society. I have suggested that our sociological analyses of such an economy often do little more than reorganise its terms of description: to make science and innovation the outcome of a proportional play between society, economy and knowledge. For this reason, I have hoped to show how anthropological description can contribute to documenting how science organises and produces itself from within. This has given me the chance to briefly present a model of the organisation and production of managerial and scientific knowledge in terms of an economy of repetition. Repetition is the name I give to the cultural economy of innovation in modern societies. Pressed to describe how innovation happens, or what its conditions of production are, my recommendation, then, is that we aim to identify not big ideas or big scientists, but to outline the conditions of investment that will allow for institutional repetitions to take place.

References

- Berman, M. 1988 [1982]. *All that is solid melts into air: the experience of modernity*. London: Penguin Books.
- Born, G. 1995. *Rationalizing culture: IRCAM, Boulez, and the institutionalization of the musical avant-garde*. Berkeley, Los Angeles, and London: University of California Press.
- Corsín Jiménez, A. 2005. After trust. *Cambridge Anthropology* 25, 64-78.
- David, P.A. 2000. *A tragedy of the public knowledge 'commons'? Global science, intellectual property and the digital technology boom-rang*. Stanford University.
- Foray, D. 2006. *The economics of knowledge*. Cambridge, Mass., and London: The MIT Press.
- Fuller, S. 2000. *The governance of science: ideology and the future of the open society*. Milton Keynes: Open University Press.
- Irwin, A. & M. Michael. 2003. *Science, social theory and public knowledge*. Maidenhead and Philadelphia: Open University Press.
- Irwin, A. & B. Wynne (eds) 1996. *Misunderstanding science? The public reconstruction of science and technology*. Cambridge: Cambridge University Press.
- Jasanoff, S. 2007. *Designs on nature: science and democracy in Europe and the United States*. Princeton, NJ: Princeton University Press.
- Kitcher, P. 2001. *Science, truth, and democracy*. New York: Oxford University Press.
- Maranta, A., M. Guggenheim, P. Gisler & C. Pohl. 2003. The reality of experts and the imagined lay persons. *Acta Sociologica* 46, 150-165.
- Mirowski, P. 2004. *The effortless economy of science?* Durham and London: Duke University Press.
- Nowotny, H. 2005. The changing nature of public science. In *The public nature of science under assault: politics, markets, science and the law*. Berlin: Springer.
- . 2007. Introduction: the quest for innovation and cultures of technology. In *Cultures of technology and the quest for innovation* (ed.) H. Nowotny. Oxford: Berghahn.
- Nowotny, H., P. Scott & M. Gibbons. 2001. *Rethinking science: knowledge and the public in an age of uncertainty*. Cambridge: Polity Press.
- O'Neill, O. 2002b. *A question of trust. The BBC Reith Lectures 2002*. Cambridge: Cambridge University Press.
- Pestre, D. 2005. The technosciences between markets, social worries and the political: how to imagine a better future? In *The public nature of science under assault: politics, markets, science and the law*. Berlin: Springer.
- Polanyi, M. 1962. The republic of science: its political and economic theory. *Minerva* 1, 54-73.
- Popper, K. 1945. *The open society and its enemies*. New York: Harper & Row.
- Rabinow, P. 1996. *Making PCR: a story of biotechnology*. Chicago and London: University of Chicago Press.
- Stehr, N. 2003. The social and political control of knowledge in modern societies. *International Social Science Journal* 55, 643-655.
- Stiglitz, J.E. 1999. Knowledge as a global public good. In *Global public goods: international cooperation in the 21st century* (eds) I. Kaul, I. Grunberg & M. Stern. New York: Oxford University Press. Oxford Scholarship Online. <http://dx.doi.org/10.1093/0195130529.001.0001>.
- Strathern, M. 2000. The tyranny of transparency. *British Educational Research Journal* 26, 309-321.
- . 2004. *Commons and borderlands: working papers on interdisciplinarity, accountability and the flow of knowledge*. Wantage: Sean Kingston Publishing.
- Wilsdon, J., B. Wynne & J. Stilgoe. 2005. *The public value of science: or how to ensure that science really matters*. London: Demos.