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Culture and Economy

Contributors: Timothy Mitchell
Editors: Tony Bennett & John Frow
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Chapter 21: Culture and Economy

To conventional ways of thinking, economy and culture stand as opposites. The economy is the sphere of material needs, it is said, shaped by a universal human requirement to interact with the environment in order to secure survival and satisfy wants. Culture, from this perspective, represents merely the local meanings people attach to this process or the particular values that shape their needs. The cultural turn in social analysis marked a shift in emphasis, drawing attention to the fact that no economic process can be understood independently of its cultural dimensions and proposing a much closer understanding of how the economic and the cultural are related. Yet the question remained one of the relationship between two different dimensions of the social world. Economy and culture continued to appear as opposites.

Today, debates about economy and culture raise a more interesting problem. How is the modern sphere we call the economy brought into being? What technical and social arrangements define it, in such a way that however many cultural aspects we show the economic to have, it seems that economy and culture still refer to different spheres or dimensions? If the term culture continues to presuppose the existence of the economic, as the non-cultural dimension in relation to which culture establishes its location, then to ask about the making of the economy is also to ask how we came to form our contemporary ideas about culture.

Economy as Government

It is generally agreed that the economy came into being as an object of government and thinkable entity only in the modern period. Most analyses locate the emergence of the economy in the development of new forms of political power and social knowledge in the eighteenth and nineteenth centuries, including new ways of administering land and labour and new methods of knowing about goods and their circulation (Appleby, 1978; Brown, 1996; Buck-Morss, 1995; Escobar, 2005; Hindess, 1998; Kalpagam, 2000;

Meurat, 1988; Poovey, 1998; Rose, 1999; Tribe, 1978, 1988). As we will see, however, the actual birth date of the economy remains subject to debate.

The appearance of the economy is often related to Foucault's well-known analyses of discipline and biopolitics (Foucault, 1977, [p. 448 ↓] 1997, 2003). If discipline refers to methods of managing human bodies through the control of movement, spatial arrangement and mechanical effort, and to the forms of knowledge that these methods generated and employed, then these new ways of governing turned the very mental and physical agency of persons into processes that could be disassembled, monitored, rearranged, intensified and recombined. Foucault emphasizes the development of these methods in the training of modern armies and in other enclosed, disciplinary institutions such as schools, prisons and asylums. But the same techniques also began to shape new worlds of supervised labour, commercial exchange and cultural consumption.

The factory became a site of discipline, inspection and the decomposition and reassembly of forces, from which Marx (1992 [1867]) derived his analysis of nineteenth-century capitalist society. In commerce, the modern joint-stock corporation, especially the large colonizing corporation, which by the early nineteenth century represented its most well-organized form, developed novel powers of accounting, control and supervision (Blackburn, 1997: p. 333; Stinchcombe, 1995: pp. 57–58). Railway corporations, which provided a template in the second half of the nineteenth century for the organization of the large industrial corporations of the early twentieth century, solved problems of managing operations over long distances and disciplining widely distributed workers and customers, in part by borrowing methods from the armed forces (Chandler, 1977; Roy, 1997). In the same period, commodity markets began to rival the colonizing corporations as long-distance mechanisms for assembling, regulating and distributing goods, their producers and their consumers (Cronon, 1991). New sites of cultural consumption and training, such as museums, world exhibitions and department stores, also developed novel methods of organizing human sociality and desire (Barry, 2001; Bennett, 1988; Mitchell, 1989).

Biopower, referring to parallel transformations at the level of populations rather than individuals, involved the organization of bodies across the territory of a modern state through measures aimed at managing the health, reproduction and livelihoods of entire communities. Sovereign power, Foucault (1997) proposes, was no longer limited to

the power to command death or let live, but was involved in creating, fostering and managing life.

As rationalities of power, discipline and bio-power involved new ways of doing and new ways of knowing. In disciplinary institutions, one sees the emergence of techniques for observing, measuring and reforming human conduct, and the numerous modern forms of accounting (Miller, 2001; Miller and O'Leary, 1987). At the level of populations, parallel forms of counting and accounting developed, in the aggregation and organization of knowledge relating to birth, disease and mortality, the growth or decline of population, the ownership of property and the circulation of wealth. As administrative authorities harnessed and developed these new methods of accounting, political life could be increasingly organized in terms of what Desrosières calls 'the politics of large numbers' (Desrosières, 1998, 2003; Hacking, 1990).

Both discipline and bio-power were concerned with questions of government, not in the narrow contemporary sense of public administration, but in the broader meaning of the term whose genealogy Foucault unearths. Government referred to ways of acting upon, regulating and managing the conduct of others, whether in governing personal conduct, managing the health and livelihoods of a population, or controlling the circulation of material and political resources.

At the centre of the new forms of government was the field of political economy (Foucault, 2003; Miller and Rose, 1990). Before the twentieth century, the term 'economy' (usually with no definite article) did not have its contemporary meaning (Mitchell, 2005a). It referred to ways of acting and to the forms of knowledge required for effective action. Originally used in relation to the family household or the estate, 'economy' denoted [p. 449 ↓] the proper management of the circulation of goods, the husbanding of resources, the supervision of labour and the accumulation of wealth. The idea of the economy of the household or estate was extended in the eighteenth and nineteenth centuries to refer to proper management on a more extended scale (Poovey, 1998; Tribe, 1978). In his article on political economy for the great French *Encyclopédie*, Rousseau explains that the word economy had originally meant 'the wise and legitimate government of the house for the common good of the whole family', but had now been extended to mean 'the government of that great family, the State' (Rousseau, 1913 [1755]: p. 117). Political economy denoted the knowledge and practice required for

governing the realm and managing its population and resources. It referred to the economy, or government, of the polity, not to the politics of an economy.

Some scholars argue that while the concept of 'the economy' in its modern sense is not found in the work of the classical political economists, the modern idea of the economy does emerge in the nineteenth century, but outside Europe, especially in the government of the colonies (Goswami, 2004). Friedrich List's *National System of Political Economy* (1856 [1841]), written by a German-American and popular in India, Japan and other parts of the non-European world, is singled out as a precocious study of the 'national economy' in its twentieth-century sense. For List as for other writers, however, the term economy still denotes the methods of government rather than its object. National economy, or 'the economy of the people', refers to 'the institutions, the regulations, the laws, and the circumstances which govern the economical conditions of the citizens'. He contrasts this with 'the financial economy of the state', which refers 'to the collection, to the use, and the administration of the material means of a government' (List, 1856 [1841]: p. 281). As with other writers, economy refers to the forms of administration, regulation, law and social circumstance that define the processes of government.

Most studies of governmentality that develop Foucault's analysis fail to notice that no nineteenth-century writer conceived of the economy as an object or sphere. Foucault himself mentions in passing that the phrase 'the economy' was not used in the period he discusses. He notes that 'the very essence of government – that is the art of exercising power in the form of economy – is to have as its main object that which we are *today* accustomed to call "the economy"' (Foucault, 1991; emphasis added). He still assumes, however, that the object exists, even before anyone knew its name, and fails to ask when it was first named, and what difference this made.

The marginalist revolution that began in the 1870s and was consolidated by the turn of the century displaced the field of classical political economy, and at the same time facilitated the rapid professionalization of economic expertise as an academic discipline (Mirowski, 1989; Routh, 1989). The possibility of conceiving of 'the economy' in the twentieth-century sense of the term was pushed further back. The object of analysis was now made up of forces, conceived as individual preferences or utilities, that were assumed to tend towards a state of equilibrium. The site of this mechanical equilibrium

was 'the market'. This term no longer referred to the social marketplace of Ricardo or Marx, conceptualized in relation to the city, to agriculture and to the factory, but to a utopic space, formulated geometrically, by the axes of a chart, as the two-dimensional plane upon which numerical utilities could meet and balance one another. As a neutral, planar surface, the market had no depth, no dynamic structure, no forces of its own, and thus no 'macro' dimension that could be described apart from the individual preferences that moved across it.

As recently as the 1920s, the second edition of *Palgrave's Dictionary of Political Economy* contained no separate entry for or definition of the term economy. It used the word only to mean 'the principle of seeking to attain, or the method of attaining, a desired end with the least possible expenditure of means' [p. 450 ↓] (Palgrave et al., 1963 [1925–1926]: p. 678). In 1932, Lionel Robbins' classic *Essay on the Nature and Significance of Economic Science* described the subject matter of economics as 'human behaviour conceived as a relationship between ends and means' (Robbins, 1935 [1932]: p. 21) and never employed the term economy in its novel mid-twentieth-century sense.

The Economy

In the course of the twentieth century, new ways of administering the welfare of populations, developing the resources of colonies, organizing the circulation of money, compiling and using statistics, managing large businesses and workforces, branding and marketing products and desiring and purchasing commodities brought into being a world that for the first time could be measured and calculated as though it were a free-standing object, the economy. 'Economy' no longer referred to a way of exercising power and accumulating knowledge; it now referred to an object of power and knowledge (Mitchell, 2005a).

The emergence of the economy in the middle decades of the twentieth century differs from the era of nineteenth-century governmentality in at least three important senses. First, economists, government agencies and corporate planners defined the economy in ways that enabled them to claim the power to measure it, manage it and, above all, make it grow. They defined it not in terms of human labour power, or the management

of resources, or the accumulation of national wealth, but as the circulation of money. The economy was conceived as the sum of all those transactions in which money changes hands, and its size and growth were to be calculated by estimating this sum. The idea of 'growth' was no longer limited in reference to primarily physical and human expansion, such as the expansion of imperial territory, national population or urban fabric. With the economy one had an object that could seem to grow almost infinitely, without changing its physical size.

Second, the idea of the economy belongs to the era of nation-states, in which human sociality is understood as a series of equivalent national units (Anderson, 1998). Each of these units claims the right to its own national state, replacing the earlier system of European colonial empires, and each is thought to be composed of a series of distinct socio-technical spaces: a society, an economy and a culture (Mitchell, 2002).

Third, the emergence of the idea that state, society, economy and culture exist as separate spheres, which collectively fill the space of the nation-state, coincided with the twentieth-century development of the social and cultural sciences as distinct professional and academic fields. Political science, sociology, economics and anthropology (and the study of national literatures and histories in the case of Western societies) each contributed to the making of its respective object, providing it with concepts, calculations, agents and methods of evaluation. Portrayed as merely an *object* of knowledge, the economy, along with these other spheres, was in fact enmeshed in the new forms of academic expertise and professional knowledge.

These new objects of expertise and public policy were constructed in reference to one another, but did not necessarily emerge simultaneously. In the case of the concept of culture, for example, the meaning of the term changed, as with the idea of economy, from denoting a process to denoting an object, but the timing varied (Bennett, 1998; Williams, 1983). The nineteenth-century sense of culture as aesthetic and intellectual development gave way to the twentieth-century concept of culture as a specific sphere of artistic and intellectual production, but the forms of government and expertise that helped define this new object emerged mostly in the second half of the twentieth century. Nevertheless, the naturalness of the idea of 'economy', 'society', 'culture' and 'state' as topological terms denoting distinct spheres of human sociality was strengthened by the way they referred to and helped define one another.

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Making the economy involved a wide range of socio-technical projects that embedded people and things in new machineries of calculation, new techniques of accounting and new impulsions of discipline and desire. The development of marketing and brand identity, the management of the flow of money by corporate and national banks, New Deal programmes such as electrification and the building of large dams, colonial development schemes and the post-war projects of development agencies and the World Bank: all contributed to the organization of worlds that could now be described and measured as the economy.

Economists and most other social scientists would argue that the novel use of the term 'economy' was simply a new way of naming an object that already existed. All societies make things and market them, buy goods and sell them. In the twentieth century, economists, business managers, bankers and government officials merely coined a new term to represent the material practices they had always been concerned with. It is important, they would say, to distinguish representations from reality, the realm of meaning from the object world to which it refers – or culture from economy.

Yet in practice they did no such thing. The representations that economists produced participated in making the economy. Their contribution was to help devise the forms of calculation in terms of which new kinds of socio-technical practice were organized, to monitor these forms of practice as though they formed a self-regulating system, and to put forward rival accounts of how the system worked. In material ways economic theory helped to format and regulate the processes to which it referred. The concepts, calculations and statistical data involved in this work were all forms of representation. But the representations were part of the object, not something outside it. In devising concepts and calculations that made it possible to imagine, manage and modify an object called the economy, economics was not simply describing what always existed. It was participating in its formation.

Embeddedness

Those who locate the birth of the economy in practices of government of the eighteenth and nineteenth centuries share a common assumption with those who locate its emergence in the transformations of the mid-twentieth century: that the economy does not preexist the forms of accounting, circulation, representation and regulation that bring it into view. One can contrast this approach with an earlier understanding of the modern emergence of the economy, that of Karl Polanyi (1944). Polanyi's argument in *The Great Transformation* shaped a generation of research among anthropologists on the relationship between economy and culture. Thanks to the work of Granovetter (1985), it has influenced a more recent generation of scholarship in economic sociology. It continues to be the most widely discussed account of the emergence of the modern economy (Block, 2003; Block and Somers, 2005; Burawoy, 2003; Carrier and Miller, 1998; Escobar, 2005; Krippner, 2001).

Polanyi shares with more recent studies the view that the modern era is characterized by the emergence of economic relations as a distinct object of government and knowledge. But he has a different understanding of how this occurred, what the economy is, and how it relates to modern economic knowledge. Understanding these differences is complicated by the fact that Polanyi wrote *The Great Transformation* in 1941–1943 (it was first published in 1944), during the years when the twentieth-century concept of the economy was being formulated. Although the book is said to describe the birth of the economy in the nineteenth century, it does not express the transformation in quite these terms, leading Block (2003), for example, to puzzle over Polanyi's inability to find adequate words for the change he is describing. Polanyi describes what happens as the separation of 'market relations' or 'market economy' (with no definite article) from the non-market relations in which they were embedded. As Hart (2004) points out, *The Great Transformation* portrays this change as [p. 452 ↓] the birth not of the economy but of 'society'. Society emerges in a counter-movement to the freeing of market relations, in the form of the collective protections and regulations required to limit the damage done by those relations. In later essays, published in the 1950s and 1960s, Polanyi recasts his argument as an account of the modern disembedding of 'the economy'. By this point, the idea of the economy as a self-contained social sphere had

become self-evident. In retrospect, however, we can see *The Great Transformation* as part of a mid-twentieth century discourse that helped identify and define this new object.

In his later essays, Polanyi shifts his focus from describing the great transformation of the modern era to understanding what the term 'the economy' might refer to in pre-modern societies. The difficulties he encounters in trying to identify the economy in societies that did not themselves construct representations of an economy are instructive.

Polanyi argues that what emerges in the nineteenth century is the economy of formal economic theory. In earlier periods, 'the facts of the economy' were 'embedded in situations that were not in themselves of an economic nature' (Polanyi et al., 1957; 'The Place of Economies ...', p. 242). In premodern societies, however, 'only the concept of the economy, not the economy itself, is in abeyance' (Polanyi, 1968: p. 86). The pre-modern, embedded economy, which he terms the empirical or substantive economy, in contrast to the formal economy of theory, is 'an instituted process of interaction between man and his environment, which results in a continuous supply of want satisfying material means' (Polanyi, 1957; 'Economy as instituted process', p. 248). Thus for Polanyi the economy is a reality that always exists; the task is to locate and map its position in relation to a larger real object, society. It may be visible as something separate from society, or it may be 'embedded' within it, disguised in other forms.

The idea of embeddedness turns out to be a difficult concept. Polanyi himself stumbles on the difficulty. The components of the embedded economy may be ecological, technical or societal, he explains, depending on whether they belong primarily to 'the natural environment, the mechanical equipment, or the human setting' (Polanyi, 1957: p. 249). But how does one identify which aspects of nature, the human and the mechanical constitute this human/nonhuman, natural/mechanical apparatus? The bare process of satisfying wants, he acknowledges, could not be identified as an economy, even an embedded one, because it would possess 'no all-round reality'. It would be just an uncoordinated sequence of movements and actions, involving the interplay of the human and nonhuman. 'What occurs on the process level between man and soil in hoeing a plot or what [sic] on the conveyor belt in the constructing of an automobile is, *prime facie*, a mere jig-sawing of human and nonhuman movements' (Polanyi, 1957: p. 249). There has to be some interdependence among the parts and some pattern of

recurrence, otherwise 'the interacting elements of nature and humanity would form no coherent unit' (Polanyi, 1957: p. 249).

The jig-sawing of the human and the non-human appears to be the key to the economy. The economy is a process or mechanism that connects the human and the nonhuman, the cultural and the material. Polanyi's co-author Hopkins offers the example of a shoemaker, a craftsman whose liminal status makes him a curiously recurrent figure in Western political thought (Rancière, 2004). To make shoes, the shoemaker must have leather. His 'having' the leather depends on a series of non-economic processes, such as the maturation of the calf and the action of acid on the hide. These natural processes are said to be external to the social system. Hopkins suggests that the economy can be thought of as a 'reduction gear' operating in 'the "boundary sphere" between the "purely" natural and the "purely" social'. The economy is a boundary mechanism that maintains the line separating the social and the natural, the human and the nonhuman (Hopkins, 1957: pp. 296–297). Only recently, with the intervention of science and technology studies, has this question of boundary mechanisms been opened up to new kinds of analysis.

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For Polanyi, the mere jigsawing of the human and nonhuman can be identified as an economy because these processes are 'instituted'; that is, they are organized into repetitive and recognizable patterns. Being instituted turns a human/nonhuman process into 'a mere referent of terms like labour and capital, craft and union, slacking and speeding, the spreading of risks and other semantic units of the social context' (Polanyi, 1957: p. 249). Human/nonhuman interaction becomes an economy – something real, possessed of an all-round reality – by becoming the referent of a discourse, a set of institutional terms and categories such as risk, capital and labour. To be real means to be the object of a discourse. The instituting of the economic enables the process to 'have a function in society' and to 'possess a history' (Polanyi, 1957: p. 249). These qualities 'cause everyday thought as well as scholarship to turn towards matters of human livelihood as a field of eminent practical interest as well as theoretical and moral dignity' (Polanyi, 1957: p. 249).

The contradiction here is instructive. On the one hand, Polanyi argues, before its disembedding in the nineteenth century the economy was not an object of which people were conscious. On the other hand, economic facts can still be found, embedded in other processes and functioning as an economy. Yet the jigsawing of the human and the nonhuman that constitutes interaction with the environment, along with the equipment used in this jigsawing, can take on an all-round reality and function as an (embedded) economy only when it becomes the object of a discourse – when both scholarship and everyday thought treat it as a distinct entity. In the end Polanyi found no way to identify an economy independent of the forms of knowledge that might be involved in its constitution.

Networks

Despite the problems encountered by the idea of embeddedness, in recent decades the concept has enjoyed a revival. While British social theory was turning to Foucault and the study of governmentality, American theorists rediscovered Polanyi. In perhaps the most frequently cited sociology article of the recent past, Mark Granovetter (1985) argues that Polanyi was partly right and that all economies, not just premodern ones, should be understood in terms of the networks that embed them in wider social and cultural ties.

American sociology was responding to developments in neoclassical economics, which had acquired a renewed interest in the study of non-market economic organizations such as the firm. In market societies, the role of large firms and other institutions represented a challenge to neoclassical accounts of the economy as the outcome of individual, utility-maximizing calculation. Economists associated with the neoliberal movement (a transatlantic political and intellectual network established in the early 1950s and enjoying a dominant position within economics in the USA since the 1970s), concerned to defend the prerogatives of corporations against government regulation, devised ways to describe firms as the result of efficient and therefore rational responses to the costs and weaknesses of market transactions and to the technological demands of production (North, 1981; Williamson, 1975). The new institutional economics, as this approach was known, was able to describe any non-market arrangement found in a

market society, including its distinctive cultural forms, as the product of self-interested calculation.

The sociologists disagreed with the new institutional economics. Granovetter showed that the economic organization of a given industry was not necessarily the most economically rational or technologically efficient, and that even the question of which activities were organized as a single industry or economic sector was in part the outcome of sociological factors. To account for developments that did not fit the logics of market rationality, he modified Polanyi's thesis to argue that even modern economies remain partially embedded in social and cultural networks. His study of the development of the electric utility industry, for example, concluded that [p. 454 ↓] the shape of the industry arose not from an optimizing rationality but from 'longstanding friendships, similar experiences, common dependencies, corporate interlocks, and active creation of new social relations' (Granovetter and McGuire, 1998).

Granovetter's work gave rise to a generation of scholarship on 'market networks', tracing the social and cultural ties in which economies were embedded. Although it offered a more persuasive account of the institutional forms of market societies than did the work of institutional economics, the sociology of economic networks had two notable weaknesses. First, as Zelizer (1988), Krippner (2001) and others point out, it continued to accept the economists' assumption that the economy should be understood as the sphere of self-interested individual rationality. The freeing or disembedding of this self-interested calculation from earlier cultural constraints is said to define the arrival of modernity. Even as attention shifted to the networks of social and cultural ties from which it is unable to fully disentangle itself, this calculating rationality itself was not open to investigation. Pure economic calculation is understood as the faculty of an individual agent, achievable to the extent that the agent can free itself from the constraints of society and culture.

This weakness is connected to a second one. Since the economy is assumed to exist as a space of individual calculation, the networks in which the economy is embedded are conceived only as connections among persons. Networks are formed out of friendships, professional associations, shared experiences, business connections and the interlocking ownership of corporations. The term embeddedness refers only to the way the economy is contained within the ties of human culture and sociality. It

does not refer to ties between persons and things, or to the complex but very common arrangements that connect together human agency, equipment or hardware of various kinds, and the codes or intellectual devices that enable networks and agencies of different sorts to operate.

This limited conception of networks is curious. Granovetter's research exploring how the economy is embedded in networks is based on a study of the formation of a complex technical network, the electrical power industry. The sociology of economic networks is said to be an approach particularly suited to studying other kinds of socio-technical network, such as telecommunications, transportation, entertainment and finance (Granovetter and McGuire, 1998: p. 167). Such networks are built out of much more than just personal connections. Yet because economic sociology shares with economics the assumption that an economy is a space of self-interested personal calculation, to re-embed this economy in culture and society requires only the demonstration of personal ties.

Socio-Technical Arrangements

Another way to understand the making of the economy has been to take seriously its socio-technical qualities. This offers an alternative to approaching it as the sphere of simple human rationality, whether a rationality disembedded at a certain historical moment by the weakening of wider social constraints, or a rationality still limited by the personal networks and cultural entanglements from which it is unable to fully extricate itself. It also differs from the Foucauldian emphasis on the economy as a form of governmentality, to be read as the expression of a particular rationality of power. The alternative draws upon research in science and technology studies (STS) and is associated particularly with the work of Michel Callon (1998) and the Paris school of STS led by Callon and Bruno Latour.

Like much of the governmentality scholarship considered earlier, Callon and Latour do not approach the world as something composed of large structures such as economies, societies, cultures, states or classes, terms denoting containers that envelop the individual or in relation to which the individual is positioned. From an STS perspective, these terms refer merely to projects that rival forces attempt to define, appeal to, act

on behalf of, or make natural (Latour, 2005). At the [p. 455 ↓] same time, they do not take the world to consist only of atomized human agents. In fact the capacity for meaningful action does not belong primarily to individual persons, Callon argues, but is typically distributed among various combinations of human beings and technical devices. Drawing on a notion of 'distributed action and cognition' (Hutchins, 1995), he refers to these heterogeneous combinations as 'actor-networks' (Callon, 1987). This term is very different from the concept of networks in American sociology, which retains an individualist conception of agency and sees networks only as the relatively stable connections between agents. More recently, Callon has preferred the term '*agencement sociotechnique*' to denote the combinations of human and technical capacities that populate the world (Callon, 2004). The phrase is usually translated as 'sociotechnical arrangement', but the word *agencement* connotes agency as well as arrangement – or what might be called an 'arrangency'. Like Foucault's concept of *dispositif*, and Bourdieu's (1977) *habitus*, it is a term that moves beyond the distinction between agency and structure. It carries more sense of collective agency than Foucault's term, however, and directs more attention to the technical and material than Bourdieu's. The use of the phrase *agencement sociotechnique* indicates that it is impossible to separate in advance the human and the technological, and that the particular mixes in which human and technical, cultural and material, animate and inanimate, are combined is a question to be answered by investigation rather than assumed from the start.

With his essays in *The Laws of the Markets* (1998), Callon brought the methods of STS to the study of economists and the economic. Echoing the way in which Foucault proposed that disciplinary methods of the eighteenth and nineteenth centuries be studied as a set of technologies, modes of calculation and forms of knowledge that spread across a range of sites, Callon argues that markets be examined as diverse calculative devices that have proliferated in the contemporary period. They are collective socio-technical arrangements that a wide range of actors attempt to shape – not just the producers and consumers of conventional economic analysis, or the firms and other agents of economic sociology, but also lawyers, bureaucrats, market analysts, accountants and economists themselves (Callon, 2005; Callon and Muniesa, 2005).

One can study concrete markets to see how these diverse forces frame and define markets. Given the role of economists and the theoretical tools they bring, economics

is not just a science for describing the economy; it is, Callon suggests, performative. Its performative aspect is especially clear if one employs an expanded definition of economics to include the great variety of technical expertise that competes or collaborates in the forming of the economy, such as accounting, management, finance, statistics and planning. From a performative perspective, the narrowly conceived *homo economicus* of classical and neoclassical economics is not to be dismissed as a fiction that should be replaced by more complete accounts of human sociality. Rather, the goal is to study how economists are actively engaged in the co-construction of socio-technical worlds that enable this narrow, calculating rationality to thrive.

Several studies have deployed the methods of STS to examine the economic. Leyshon and Thrift (1997) study the dynamic international actor-networks transforming the production and distribution of money. Holm (2001, 2007) demonstrates the socio-technical work required to transform fish in the oceans into quotas that can be owned and traded. Caliskan (2007) examines the calculative technologies deployed in the construction of the global cotton market. MacKenzie (2006) explores the creation of a market for financial derivatives in which the latest economic theory is built into the market's structure. Other recent studies of finance and financial markets that draw to differing degrees on the methods of STS include Beunza and Stark (2004), Knorr Cetina and Bruegger (2002), Lépinay (2003), Muniesa (2003), Riles (2004) and Zaloom (2006). In each [p. 456 ↓] case, rather than examining the gap between economic representations and the reality of economic practice, the authors show the constitutive role of economics in performing the economy. Knorr Cetina and Preda (2005) and MacKenzie et al. (2007) bring together many of these studies in edited collections, while Barry and Slater (2004) explore some of the political implications of STS for the study of the contemporary economy.

The strength of these kinds of studies is in their detailed analysis of particular market arrangements, deployments of knowledge and practices of calculation. Rather than asking about the relations between economy and culture, or between market rationality and social ties, they examine the socio-technical work that makes calculation possible and that frames certain agents, objects and computations as markets. However, this focus on the technologies of the market means that such work does not, on the whole, address the larger question of the economy as a space of calculation and political project. Can the methods of STS be used to think not just about markets, but about the

economy? What would this entail, and how would it enable us to think about the co-constitution of the economy and culture as objects of government and knowledge?

The Economy as Socio-Technical Project

An approach to the question of the economy is suggested by an earlier work in science studies, the superb account by Thomas Hughes (1983) of the making of the modern electricity industry in the USA and Europe. This is arguably the best study available of the socio-technical work of making the industrialized economic world of the late nineteenth and early twentieth centuries. The formation of this technical world predates the emergence of the economy as a political project in the mid-twentieth century. But in the building of large-scale socio-technical schemes of this sort one can trace the creation of the kinds of arrangements and agencies that could be subsequently grasped and measured as an economy. Hughes's work can be used to outline an analysis that does not take for granted the concept of the economy, embedded or otherwise, and thus brings into view the work involved in making the world calculable in new ways. At the same time, since Hughes's study examines the design and construction of networks – for the generation and distribution of electricity – it enables us both to enrich and to see the limits of the concept of a network employed by economic sociology.

The first thing to consider is the nature of the new socio-technical networks of the twentieth century. Electrical networks differ from, say, the networks of colonial trading corporations that spanned the globe a century before Thomas Edison created the Edison Electric Light Company, or the computer networks developed a century later. But in each case a network is something much more than the array of personal ties described by economic sociology, or by similar work in economic anthropology. It is a technical arrangement as much as a social one. The technical dimension and its place in hybrid forms of agency and *agencement* is what is most lacking in more conventional cultural or sociological understandings of the emergence of the economy.

To build the new electrical networks, Edison had to establish not only ties among investors, politicians and technicians, but also circuits for the transmission of capital into his enterprises, generating stations to transform coal into electric power, carbon filaments whose resistance was calibrated to the current-carrying capacity of copper

cables and to the cost of the copper, a system of patents and the means to enforce them, and cable networks to carry direct or alternating current from place to place (Hughes, 1983). These other elements would traditionally be described as purely physical, technological or financial, in contrast to the social and cultural ties among agents that economic sociology describes. But the development of domestic electric lighting did not respect such categories. It depended upon building networks that tied together [p. 457 ↓] humans and electrons, the flow of electric current and the flow of capital, the calculation of the cost of copper wiring and of its conductivity.

Hughes describes some of the heterogeneous connections involved (Hughes, 1983: pp. 39–41). The Edison Electric Light Company, set up in 1878, did not sell lighting. It held patents on the devices Edison's team invented—light bulbs, generators, distribution systems – and licensed or sold the patents around the world to raise income and attract investment to finance Edison's workshops, experiments and demonstration projects. It organized capital flows through networks of lawyers, legislation, patent enforcement and publicity. Edison's first central generating station began commercial operation in 1882 in New York City at 257 Pearl Street, close to Wall Street. The location was chosen to attract the attention of financiers, and because the half-mile radius its distribution network could reach included many shops and restaurants, which would draw customers and publicize the system. This was not just a human network, connecting Edison to friends and financiers. It was a hybrid network, connecting engineers, generators, filaments, buildings, consumer desire and capital investment.

Such hybrid networks began to put in place the interconnected spaces and flows that could subsequently be identified as the economy. The economy was not a mechanism for managing 'the "boundary sphere" between the "purely" natural and the "purely" social', as Polanyi's followers suggested. The natural and the social are not separate territories that meet along a frontier, as the placing of the term 'purely' inside quotation marks already tacitly acknowledges. Any collective project draws upon multiple animate and inanimate elements, mixing them in new combinations. Rather than operating as a boundary mechanism between spheres that are already separate, the economy offered a way of resolving these hybrid forms into what could begin to appear as a world simplified into separate realms. By transforming their nonhuman elements into mere objects of human calculation, large-scale socio-technical projects could manufacture

worlds that appeared divided into nature on the one hand, and human calculation on the other (Mitchell, 2002: pp. 31–38).

This work of simplification never quite succeeds. As Callon (1987) points out in a study of rival projects to manufacture an electric vehicle, the relations among the heterogeneous elements of socio-technical networks do not form a fixed topology that might be precisely mapped and made predictable. Agents try to recruit new elements, and the relationships among them are open to constant manipulation and reconfiguration. Hughes relates how a battle broke out between Edison's direct current system and the alternating current system of the Westinghouse Electric Company. Alternating current could be carried at much higher voltages, allowing the transmission of electric power over greater distances. To alter the calculations about the cost-effectiveness of the rival system, Edison tried to associate the higher voltage of alternating current with the danger it posed to humans who accidentally connected themselves to the network. He joined forces with those advocating the use of electrocution as a humane method of putting people to death and helped persuade the New York State Legislature to replace hanging with death by electrocution, using a Westinghouse AC generator installed in Auburn State Prison (Hughes, 1983: p. 108). The electrocution of William Kemmler on August 6, 1890, marked the beginning of the twentieth-century recruitment of the shock power of electricity for a variety of political purposes (Ronell, 1989: pp. 375–376)

As this example suggests, the building of socio-technical networks offers a different way to think about the question of economic rationality or calculation. If economic sociology tries to preserve a distinction, inherited from Weber and from Polanyi, between the 'purely economic' and the broader social relations in which the economic is shown to be (partially) embedded, Hughes's study of the electricity industry provides the basis for a different understanding of how the [p. 458 ↓] economy as a realm of calculation comes into being.

A study by Latour (1996) of a project to build another socio-technical network, a driverless railway system in Paris, shows how the economy was not an external 'reality principle' against which the design of a new project would be tested. Similarly, Edison's project did not involve designing a technology in the workshop that would then be taken outside the workshop and introduced into 'the economy'. His team had to create an

economic calculus inside the workshop, as an integral part of the design of the network. They acquired arc-light generators, the older lighting technology they hoped to replace, and measured the cost of their operation. They collected information on the cost of copper wiring of different gauges, and visited plants using arc-light dynamos to take notes on transmission losses and the cost of fuel. They purchased back volumes of gas journals and the proceedings of gas engineering societies, to calculate the rival costs of gas lighting and the candle power it achieved (Hughes, 1983: pp. 28–29).

As Hughes explains, however, information about comparative costs could be made useful only by integrating it with technical calculations about the properties of materials and electrical circuits, and social calculations about the density of housing and population. Edison's team realized that Joule's and Ohm's laws could be used as tools to relate the costs and material properties of the components. They wanted to lower the current in the system, to reduce expensive transmission losses and the cost of copper cable. Learning how to use Joule's law, they realized that a proportionate increase in the voltage would enable them to reduce the current without any loss in the level of energy. To increase the voltage in proportion to the current, Ohm's law provided the method: raise the resistance, by designing an incandescent bulb with a high-resistance filament, and at a constant current the voltage would increase (Hughes, 1983: p. 36). These calculations were related in turn to the number of households and businesses in certain cities located within the radius that could be reached by a network of a given energy and gauge of distribution wiring.

The economic calculus was not an economy of rational agents outside the system. It was an apparatus of calculation that brought elements from other projects – generator costs, transmission losses, data on gas lighting, population densities – into Edison's workshops at Menlo Park, New Jersey, where they could be combined with other instruments of measurement and calculation in the construction of an electrical system. These calculations, built into the design of the new electrical equipment, would then be carried back, depending on the success of Edison's project and the rivalry of alternative calculations built into the designs of his competitors, and installed in shops, factories and homes. Successful calculation would help bring into being a chain of sites increasingly ordered in ways that reinforced those calculations. The power of calculation was never simply a faculty possessed by individual agents. It was a property of particular socio-technical arrangements. In a similar way, Callon's (1987) study

of electrical vehicle projects shows how the engineers involved could be considered 'engineer-sociologists', as each project presupposed not just a rival technical design but a rival social world in which their calculations and designs would make sense.

Since such calculations were helping to bring into being the world they calculated, success did not necessarily depend on having the most accurate figures. What mattered more was whether the calculations enabled the network to be conceived and built. As one can see from the studies by Guala (2001) and Mirowski and Nik-Khah (2007) of the creation of another network, cellular telephones, successful calculative devices are not necessarily those that are the most statistically complete or mathematically rigorous. They are those that make it possible to conceive of a network, or market, or national economy, or whatever is being designed, and assist in the practical work of bringing it into being.

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Economics is not a calculus that exists in advance, which then determines the success or failure of different technologies. The economy is not a pre-existing sphere, into which technological innovation introduces changes. Rather, there are different attempts to introduce calculations and persuade others that they are superior to rival models and calculations. The economy is a twentieth-century invention that was built out of such rival projects.

An important feature of this world of calculation is that there is no simple divide between an experimental or simulated world of the industrial workshop or business planning and a real world outside it. Every situation offers a certain arrangement of the simulated and that to which it refers. Edison's team built models to test the relationships among costs, material properties and electrical flows using batteries, fine wires and 'Kirchhoff's laws of conductor networks' (Hughes, 1983: p. 23). Although just a model, it was a real circuit carrying live electricity. Next they built a full-scale demonstration project, providing lighting for the Menlo Park offices and workshops, which was used to impress investors and tie them into the project. Even their first commercial network, the Pearl Street power station, as we saw, was designed as a demonstration project. Every instance of building networks was simultaneously a demonstration and the thing being demonstrated.

As the network was built, there were many other socio-technical problems to be solved: basic issues of the subdivision of light (the existing arc light technology produced too intense a light for small spaces), so that large numbers of small consumers could be connected to a single distribution system (Hughes, 1983: p. 31); conventions of address and other 'knowledges of position' (Thrift, 2004), so that consumers could be identified, metered, and made to show up reliably in accounts and billing procedures; and statistical methods for anticipating trends and cycles of demand, matched with electromechanical devices for balancing load and supply. Solving such problems generated new kinds of information and calculation.

These issues were typical of the technical problems addressed by a series of large-scale projects of the later nineteenth and early twentieth centuries, including such areas as the oil industry and its long-distance pumping, shipping and retailing networks; the building of large dams and associated irrigation and hydro-electric systems; the manufacture and marketing of consumer goods with brand identities that could circulate and be protected on a national and international scale; and the development of mechanized global warfare that required an unprecedented coordination of manufacturing, energy supply and civilian manpower. The forms of technical calculation, of distribution and the control of flows, of addressing, accounting and billing, of public demonstration and marketing, and many other widely replicated procedures and techniques, helped to constitute the world that would later take shape and be identified as 'the economy'.

The fact that this discussion has addressed these issues in terms of the question of networks does not mean that all forms of econotechnical practice should be understood according to the model of a network. The question of networks is of interest because examining a project organized as a network, such as an electrical system, brings into view the limited nature of the sociological concept of networks – the way it ignores the technical properties of the very networks studied. But not everything is built as a network. Even things organized predominantly as networks also try to create isolations and disconnections. Some projects involve very little networking. Miller (2002) proposes the looser idea of entangling, following the work of Thomas (1991) that rethinks the anthropology of exchange, while Callon (2005) describes a double movement of entangling and disentangling. But the same issues arise of calculative devices, the organization of alliances, and of connections and disconnections. The same points

apply about not starting with economy, society, culture and state, as objects, and asking how they relate, but tracing instead the socio-technical projects and rivalries that [p. 460 ↓] helped bring these contested objects into being.

Virtualism

The projects of regulation, planning, measurement and metrology in which the economy emerged belong to a particular era. The economy was first formatted and measured in the interwar decades of the twentieth century, drawing upon new ways of organizing consumption, defining the qualities of goods, producing consumers, managing large-scale technical projects and generating statistical knowledge. The wartime development of industrial planning and statistical research, the collective regulation of wages and prices, and the government mobilization of economic expertise accelerated the reorganizations of socio-technical life that produced the economy as a distinct object of measurement and political management. In the postwar decades, among the advanced industrialized countries in particular, the economy was established as the central object of national politics. The main responsibility of government was to manage what could now be called growth: the rate and direction in which this newly identified object was expanding and the adjustments and balances required to maintain its momentum. Economists devised the tools of calculation on which this politics depended, helping to determine what social costs could be counted and what could not, and to distinguish those political claims that could be calculated and compared from those that were incommensurate. The economy was both a way of calculating and representing social and material worlds, and a set of projects for producing worlds that are calculable and representable.

In the final quarter of the twentieth century, these calculative projects were exposed to new kinds of criticism and doubt. The environmental movement emerged as one source of criticism (Henderson, 1978; Meadows et al., 1972; Schumacher, 1973), arguing that the economy was defined in a way that excluded many of the real costs of social actions, such as ecological damage and the exhaustion of nonrenewable resources. Feminist and other progressive movements drew attention to the way household labour and other unpaid or unmonetarized activity escaped economic representation. Even orthodox academic economists began to question the possibility of adequately

measuring and representing the economy (Eisner, 1989; Griliches, 1994). They attributed the difficulty to the growth of service industries such as finance, information, tourism and culture and entertainment, where it was difficult to define the product or measure its turnover, and to the increasing rate of innovation and specification of consumer goods, which made it difficult to compare the value of different products.

Accounts of the 'postmodern condition' (Harvey, 1990; Lyotard, 1984) related this expansion of service industries and cultural consumption to a transformation in the nature of knowledge itself. Digitized as 'information', knowledge was becoming the most important commodity of a postindustrial age. In Lyotard's view, knowledge should be considered 'a major – perhaps the major – stake in the worldwide competition for power' (Lyotard, 1984: p. 5).

If postindustrial economies are formed increasingly of commodified representations, what consequences follow for the projects of economic measurement, calculation and representation that helped organize the economy as an object? How do economic representations represent a material world that is composed more and more of representations? One line of thinking addresses this as the problem of 'virtualism'. Carrier (in Carrier and Miller, 1998) suggests that the change from material consumption to the consumption of increasingly abstract commodities marks the latest stage in a process of abstraction that has defined the history of modernity. The reference is once again to Polanyi. If the modern world disembeds the practical activities of production and circulation from 'social and other non-economic contexts' (Carrier and Miller, 1998: p. 3), then the contemporary commodification of culture can be understood as the latest stage in this history of abstraction.

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Economic representations, according to this argument, perform an increasingly powerful role in the history of abstraction. The process of 'practical abstraction' of economic activity is accompanied by a movement of 'theoretical abstraction'. In both academic and everyday contexts, people try to understand economic situations by relying on increasingly abstract models. The theoretical abstractions of economics have become so pervasive as cultural forms that people are now fooled into mistaking these abstractions for the world they represent. They take the virtual world of economic

representations as something real. The final step into this condition of virtualism is marked by the increasing ability of economists and others to empower economic abstractions, by making the world itself conform more closely to the patterns of their economic models (Carrier and Miller, 1998: p. 2).

The leading contemporary example of the politics of virtualism, Carrier and Miller suggest, is the political project known as neoliberalism. Miller argues that the neoliberal effort to reorganize social worlds according to the rules of neoclassical economic theory has led to the 'dominance of economic theory over actually existing capitalism'. He relates this change to the spread of forms of simulation, self-monitoring, auditing and accounting characteristic of contemporary social life, all of which try to replace 'the reality of economic practice' with more simple representations. Economic theory is one of several such simplifications. These representations can become so powerful that they attempt to replace 'actual economic practices' with the simplified models (Miller, 1998: p. 198).

Several questions can be raised about this way of understanding the contemporary relation between economic representations and the reality they invoke. First, it is certainly the case that the neoliberal movement has turned the deployment of economic experiments into a widely used political technology, a technology whose distinctive rationality of government has been the subject of a number of discussions (Barry et al., 1996; Brown, 2003; Lemke, 2001). However, there is nothing new in the use of economic arguments as tools to reorganize social practice. Social science has always been involved in social experiments – in attempts to reorganize patterns of urban life, for example, or methods of controlling deviance, or systems of trade, according to scientific principles. Political economy emerged in the seventeenth and eighteenth centuries as a new knowledge and practice of government in conjunction with the political projects it helped to reorganize, such as the trading and governing activities of the East India Company or the British colonization of Ireland and North America.

Second, as Maurer (2005) argues in his study of two modes of alternative economic activity, local currency initiatives and the practice of Islamic banking, economic agents themselves are often involved in a complex deployment of the real and the virtual, simultaneously escaping dominant representations and reenacting them. What is genuine and what is counterfeit, he argues, is not a question to be resolved simply by

more accurate sociological description. More generally, the virtual is not a screen or display that disconnects us from the real. Rather, the modern experience of the real has always involved the production of what claims to be a realm of mere models or simulations (Mitchell, 1991, 2000). We secure our sense of the objectivity of the world as a reality prior to and independent of its representations by staging what appears as the separation of the virtual from the real. Producing the existence of the economy as a world that seems to stand apart from the economic representations that describe it is perhaps the most commonplace twentieth-century form of this technology of the real.

Finally, studies of the actual deployment of neoliberal models reveal a political process in which success depends less on forms of abstraction than on the political alliances and powers of discipline that a project gathers together (Elyachar, 2005; Mitchell, 2005b). The way in which economic models were used in the USA to design the market for cellular telephone licences illustrates this well (Guala, 2001; Mirowski and Nik-Khah, 2007). To create a national cell [p. 462 ↓] phone industry, the Federal Communications Commission (FCC) decided that the right to use new frequencies of the wireless spectrum should be auctioned to the highest bidder, rather than simply given free to those who applied for it as with earlier uses of the spectrum. They invited economists with rival models of how markets work to propose designs for the auction process. The economists encountered unexpected difficulties in this creation of a new market: the rivalries among game theorists recruited by different corporations, shortcomings in theoretical models that forced the game theorists into an unusual collaboration with experimental economists, and tiny errors in the design of the auction procedure that triggered much larger failures.

Mirowski and Nik-Khah argue that in the end the outcome was determined by the power of large corporations. The socio-technical problem of designing the market was 'yet another instance of bigger forces determining the economic outcomes while masking their activities with a fog of learned disputation and superfluous mathematics' (Mirowski and Nik-Khah, 2007: p. 34). This confirms their view that 'more durable structures like the nation-state, the corporation, and the military' shape economic practice – and the practice of economics (Mirowski and Nik-Khah, 2007: p. 42). They return, in other words, to a capitulo-centric argument, to use Gibson-Graham's (1996, 2006) term, in which the political and military-industrial institutions of large-scale capitalism constitute a

determining structure, a frame inside which particular activities, such as the emergence of a new industry or the design of a market, take place.

Yet this is not what their study and other accounts of the FCC case suggest (Guala, 2001; Murray, 2001). While some 'bigger forces' came out of the FCC auction as winners, not all of them did, and in some cases smaller actors were transformed into bigger forces in part by their deployment of economic calculation. To describe the outcome of an uncertain situation of techno-political contestation as the unambiguous and predetermined result of larger economic forces is to surrender the political field to agents that have neither the coherence nor the power attributed to them, but that benefit from every declaration that they represent a structure and logic that cannot be overcome.

The objection is not to the argument that corporations or government agencies may be powerful and often seem to get their way. It is about methods of thinking about how and why this happens. The problem lies in the often implicit assumption that such things form a 'structure', understood as those 'bigger forces' whose power needs no explaining because it assumes the form of a permanent frame or constraint that envelops the particularities of modes of calculation or mechanisms of interaction; or that they constitute 'the economy' (another kind of structure) or 'the state' (yet another) (Mitchell, 1999). As soon as we populate our analysis with these monstrous objects, the work of understanding the constitution of the economic is closed off.

Conclusion

The problem of economic representations and the virtual character of contemporary economic life brings us back to the general question of economy and culture. If the economy comes into being as a political project and knowable object only in the twentieth century, it stands in a special relationship to the emergence of culture as a parallel field of governmental practice and specialist knowledge.

Thanks to the influence of the work of Polanyi, the idea that the economy appears as a distinct object only in the modern era has been widely accepted. Yet from the reading and misreading of Polanyi's work two unhelpful tendencies emerged in

thinking about economy and culture. The first was the tendency to assume that the twentieth-century concept of the economy was simply an elaboration of eighteenth-century and early nineteenth-century ideas about self-regulating patterns of exchange. The problem with this assumption is not just that the use of the [p. 463 ↓] term 'economy' in its contemporary sense emerges more than a century after the work of the classical political economists. It is that tracing its emergence back into the past diverts attention from the twentieth-century innovations in techniques of business, patterns of empire, technologies of distribution, uses of money, control of energy, management of consumption, production of desire, styles of knowing and forms of expertise that made possible the making of the economy.

The second unhelpful consequence was a certain conception of the relationship between economy and culture. The term culture was used to denote the larger ground in which pre-modern economies were embedded. In more recent formulations, it denotes the meanings people attach to economic processes, the ways in which different communities represent the economic, or the shared values and attachments with which the force of economic calculation is attenuated. In each of these ways of approaching culture and economy, the two terms denote different spheres or dimensions of human sociality. As a result, the underlying question always remained the problem of how these rival spheres affect one another, or how resources from one sphere can be transformed into the other (as with discussions of turning cultural capital into economic resources). Since the cultural is understood as the local and the meaningful, a further result of these ways of thinking is that the economic by definition stands for what is universal. The economic is taken to express principles of necessity or rationality that transcend the particular cultural sites and meanings in which it may be found.

The alternative approach to the making of the economy that has emerged in the last few years involves a different understanding of its relationship to the question of culture. Approaching the economy not as a feature of all societies, more or less visible or embedded, but as a set of metrological projects that came to dominate the politics of the middle and later decades of the twentieth century, makes it possible to trace the way those projects were often intertwined with the reformulation of culture as an array of collective resources to be managed and a new set of fields for the government of conduct. The transformation of culture into an object of government was not necessarily simultaneous with the making of the economy, for these projects had

differing and overlapping temporalities. But they were linked by common technologies of representation and by the tendency of one transformation to refer to and reinforce the other. The more work that was done to make the economy appear as a distinct object to be measured and managed, the more readily culture could appear as its own realm of government and expertise.

Timothy Mitchell

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