Book Reviews

Karl Rogers:
Modern Science and the Capriciousness of Nature.
Palgrave McMillan: New York. 2006. 256 pages.

This book is a sequel to Rogers' previous book *On the Metaphysics of Experimental Physics*, in which he argued that experimental physics are premised on metaphysical notions. In the book under review, Rogers generalizes this argument to the modern natural sciences in general, to technology, and ultimately, to society at large.

Rogers starts off his book by describing our sense of otherness when confronted with nature. While this experience of otherness sometimes brings us wonder, beauty and bounty, nature is also experienced as a source of destructive forces. Nature is 'capricious'. The author quickly points out that he does not bestow some form of intentionality on nature – he is rather hesitant to admit religious or teleological interpretations of nature. The author focuses on the destructive capacity of nature, arguing that it is from our sense of harmlessness that modern science derives its drive to harness human society against nature. This ontological assessment of nature will remain stable throughout the book. The goal of the book is to examine the rationality of the technoscientific enterprise within the recognition of nature's potential harmfulness.

Rogers argues that the goal of modern science is to furnish insights into nature in order to protect society from its malevolent effects by technological means. Technology is central to modern science,

not only as a goal or a method but also as a key component of its epistemology. Modern science sees the workings of nature as a series of machine performances. According to Rogers, mechanical realism has become the metaphysical ground of modern science. With the metaphysical precepts of mechanical realism in mind, scientists can generalize from their controlled experiments to a reality outside the laboratory, because the same mechanical 'laws of nature' are at work. Mechanical realism blurs the border between the natural and the artificial in classic thinking. This type of reasoning first emerged at the University of Padua in the 16th century, and Rogers briefly indicates its history through Galileo, Newton, and Darwin, up to Roy Bhaskar's critical realism.

The metaphysics of mechanical realism allowed for the conception of technology as a way of mastering nature. Drawing on Heidegger, the author criticizes the disclosure of nature as a standing reserve. He identifies cybernetics as the cumulus of the process of positivistic metaphysical reduction, which disconnected the notion of mechanism from causality and replaced it with a concept of control. Cybernetics reduces "the spontaneity of Nature […] into its capriciousness" (p. 118) and amputates its otherness. This makes science a self-referential endeavour, which substitutes nature, creating its own reality in which

'objective' truth and technical manipulation are mutually dependent, concealing the metaphysics upon which it is based. Drawing on Lukács, Rogers argues that Marxist dialectical materialism follows this course of reasoning, too, and has a basic belief in the goodness of the technological society. The self-referential character of technoscience makes is futile to evaluate it using scientific tools or ontological arguments about nature. According to Rogers, only a metaphysical evaluation of the vision of society (or its absence) can address the question whether this course is a good bet and leads to a fulfilment of a certain vision.

Rogers then argues that we need to develop a free relation with technology if we were to regain control over the rationality of the technoscientific project. Given that technology is always an unpredictable experiment, evaluations cannot be given beforehand. Therefore Rogers favours the development of societal pluralism together with participatory democracy. Different individuals and local communities should experiment with different forms of living and technology development, while communicating with each other about the outcomes. This prevents societies from putting all their eggs in one basket. To make a genuine dialogue about the outcomes possible, however, a representative democracy is not enough, nor is the delegation of responsibilities to technical experts. Rogers argues that it is through personal relationships and intimate dealings with our surroundings that we can regain our abilities to evaluate the consequences of technological and societal choices.

The book is not an easy read. Several sections are structured as an alternation of descriptions of key thinkers and comments on these authors. As a result, Rogers' own voice seems to become lost at several moments. Also, his overall line of argument is difficult to follow or conceptually troubled as he fails to give positive definitions of the concepts he concatenates throughout the book. For instance, going back and forward between philosophical analysis and history, the notion of mechanism becomes unstable. In a central argument in the book it is connected to causality in machine performances, but later on it is also identified with control in cybernetic systems. A wider definition of mechanism would be more appropriate (see Dijksterhuis, 1961), but would probably undermine the flow of the argument.

Since his critique is generally formulated as opinions written in the first person without much reference to other thinkers, Rogers disables an imaginary dialogue between different streams of thought. Therefore Rogers' tracing of 'mechanical realism' in western thought acquires a monolithic tendency. He pays little attention to different types of opposition to the development of mechanical realism or the internal tensions present in its exponents. Newton is there, but Goethe – a typical case to be examined if the author were interested in opposition to mechanical realism – is absent. Another example, labelling Darwin as a mechanical realist does injustice to his subtle complexity. Darwin's thinking was significantly influenced by German Romanticism through Alexander von Humboldt and others (Richards, 2004). Today, many biologists themselves recognize the tension between the ecological sciences and environmentalist activism, even if they have no ready solutions for it. Detecting such internal tensions and counterpoints would have contributed a wider range of alterna-

tive thoughts and practices to our current technological society, which could then have enriched Rogers' proposal for an alternative, which now seems to be based on a utopian vision rather than grounded in contemporary experiences with participatory technology design and the democratization of science.

A further problem of the book is Rogers' ontology (or its absence) of nature and metaphysics. The book suppresses the question whether intentionality underlies the 'capriciousness' of nature or whether it is laden with moral values. Rogers wishes to use his argument to open up space for moral considerations, but confines the connection to morality to deliberations about a good society only. However, I find it difficult to imagine how a moral dialogue on technology could be viable without reference to the ontology of nature or metaphysics. Rogers adheres to the view that our fear for the capriciousness of nature is a primordial anthropological force and that moral or ontological questions about it are mute. I ask myself whether this is an adoption of the terms of debate set by technoscience (alternative ontologies are simply ridiculed by 'hard' scientists as subjective and esoteric) or whether this has a real ontological basis in Rogers' thinking. The otherness of nature is evoked to set the problem of the book and emphasized throughout the analysis (Rogers capitalizes the word throughout the book), but in the end analytical primacy is given to the social even though social, technological, and natural forces cannot be easily disentangled in modern technological society. Likewise, Rog-

ers uses metaphysics to show the deficits of the epistemology of technoscience, but does not define the scope of the term and uses it mainly in a negative way; no alternative is explicitly articulated. Following Charles Taylor's (1989) critique, I think that a Habermasian participatory democracy in itself cannot reconnect us to our moral sources (nature, metaphysics or others), and that the confinement to a negative argumentative strategy through epistemology evades some important ontological questions, which are constantly present in the background, but which are not articulated in this book.

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A. Aneesh:
Virtual Migration: The Programming of Globalization
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The main debate that dominates the current discussion on globalization concerns its supposed borderlessness and its related newness. Some authors argue that the nation-state has receded in the background yielding room to the global flows of labor, capital, images and ideas. Others argue to the contrary, that globalization reinforces the nation-state. Thus 'borderlessness' and 'newness' are brought together in the same analytic framework and constitute one another in these debates. Such debates are not unusual in the intellectual history of capital. However, does it help us understand the processes of capital beyond a cataloging of continuity and change of the ways in which capitalism operates and cascades into other domains of life?

In *Virtual Migration* A. Aneesh offers us a different reading of globalization through an in-depth research with Indian software programmers, engaged by US corporations in the United States and India. Aneesh's book offers a cogent review of the globalization literature and clearly asserts his stance: "the (national) border has only grown in significance" (p. 1). However, he uses the debate as an entry point to his analysis. The value of the book lies in the mapping of the complex processes of globalization that we consider abstract, which in reality involve actual lives. Aneesh succeeds in pointing out to us the obscure links that make globalization possible.

The methodological significance of the work lies in its multisided ethnography, necessitated by the 'global' subject and the theoretical treatment of the ethnographic material to elicit the nuances of globalization. Aneesh offers us a productive approach by focusing on the kinds of practices that govern the global movement of capital, codes and individual lives and initiating a new mode of thinking about the simultaneity of these processes. He explicates the new configuration of activities and processes by an unexpected and brilliant analogy with the introduction of 'oxygen': the concept of "globalization was discovered in a manner similar to oxygen" leading to a paradigm shift as suggested by Thomas Kuhn. (p. 20). Similar to 'oxygen', 'globalization' too is a "dense gathering of different concepts...a different, if not new, way of looking at certain forms of integration" (p. 20). The difference with the previous orders lie in what he calls 'virtual migration' where the work travels while the worker and the conditions of work remain stationary. In addition, 'virtual migration' condenses the various elements of labor practices of 'virtual' work managed by a 'programming scheme' between the United States and India: capital, software code, nation-states, personal biographies, and individual affective states. These various elements that collaborate, collude and congeal are arranged in the programming scheme that differentiates the

'new labor regime', which now spans across continents.

The realignment of space and time is central to this study. The decoupling of the 'body' from its 'performance' results in a different kind of temporal integration when servers, software engineers and clients are differentially located across incongruous geographies and time zones. The author shows through his 'programming scheme' that the governance of the otherwise dispersed code and capital in 'virtual' work is knit through the 'rule of code' or the 'rule of algorithm'. Aneesh names this 'algocracy' to focus on the programming code, which is under-analyzed. Algocracy is 'a new kind of power' and a distinguishing marker of the current era of globalization. The 'rule of code' organizes transnational labor through an optimal algorithm of code and capital, space and time (p. 5). For example, an algorithmic relationship between the customer database and the software program determines which set of customers are called from a call center at a given time; the calls that we receive, say for a new credit card offer are thus not arbitrary.

The strength of the analysis lies not only in its focus on the power of the code, but on an unprecedented kind of power that "gradually replace(s) the early subject-object relationships" in the ability of programming to channel work and also "point out incorrect steps taken by the user" (p. 110). Does algocracy then disallow space for human agency? What are the politics of programming beyond the logical techniques themselves? These are some of the questions that come to mind when we are grappling with a regime of work dominated by intense competition among individuals, corporations, and nation-states.

Interpersonal and other forms of micro-politics of programming remain obscure in the book. While arguing that algocracy is the overarching paradigm that defines and constitutes global work, it would have been further helpful to examine how algocracy too becomes vulnerable in the process of human interactions. The workspace is not an isolated domain; it is a space of customary politics that can play with algocratic logic. In my own ethnographic research with a major Information Technology company in Bangalore involved in the same global circuit, one of the prevailing anxieties of the management was the risk of programmers withholding programming knowledge (known as 'tacit knowledge') from the company. If global work is theoretically about teamwork, interpersonal politics are not rare in practice when individuals reserve knowledge for personal professional mobility. The problem that I am alluding to is sufficiently acute for the company to institute cash and material rewards for what they call 'knowledge sharing', a norm the management wants to encourage.

Although the focus of the book is on 'virtual migration', the reader encounters it in contradistinction with another form of global labor known as 'body shopping'. 'Body shopping', which refers to the actual movement of software programmers from India to the United States, is tied up in the lattice of immigration policies, transnational capital, individual aspirations and troubled personal lives. Body shopping provides 'flexible' labor that can be deployed and terminated respectively as demands arise and fall. The detailed treatment of body shopping segues to the shifting mode of labor practice that is gradually taking an algocratic form in virtual migration. The novelty of the two modes of labor does not lie in their temporal trajectories but in the ways they inter-

act to inform current practices of global integration.

Another important aspect of the book is the place of affect particularly in the practice of 'body shopping'. The author's bold analysis shows how physical movements across the globe unsettle the emotional fabric of belonging. The kind of flexibility 'body shopping' offers is associated with what Aneesh appositely calls, the 'transnational condition' that locks in a grid of work pressure, desire, homelessness, cultural alienation, and racial tensions. In his exploration of belonging in the nation, the centrality of 'home' is crucial. The 'home' oscillates between India and the United States. Here one can see a parallel with the colonial regime, where for colonial officers once having lived in the colony, there was no 'going back home'. The coloniz-

er's analogous experience would have provided a historical depth to the understanding of migration and the dynamics of capital that underscored it over time.

Despite these shortcomings, Aneesh' *Virtual migration* is a valuable reference for academics engaged in STS studies, sociology, anthropology, politics and economics. Policy makers and software programmers will also find it useful for the details of lives that fluctuate across nations. Above all, it is a book that a curious mind vexed by questions of globalization will find indispensable.

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Patrick Carroll:
Science, Culture, and Modern State Formation
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In his *Science, Culture, and Modern State Formation,* Patrick Carroll asserts: "speaking coherently about the state is far trickier than it might first appear" (p. 1). Thus, while the 'pluralist state', the 'capitalist state', the 'leviathan state', and the 'patriarchal state', for example, have all been central to political study, Patrick Carroll argues that the social sciences have generally paid little attention to the development of the 'scientific state'. Carroll's book therefore sets out to explain the scientific influence of England's colonial presence in Ireland during the 17th century. He argues that this was able to exert a particular engineering and political culture on the formation of the Irish state, where its influence can be observed in three ways:

- the development of the state as an *idea,* i.e. discourses around understanding the concept of state;
- the construction of the state as a *system,* i.e. as an organization of administrative practices;
- the perception of the state as a *country,* i.e. the materiality of the land and people that have been incorporated into the state.

From the second half of the 17th century, he suggests that institutions such as the *Royal Dublin Society* and the *Royal Irish Academy* became catalysts for ideas on political economy and state construction. These ideas began to circulate between influential figures such as

Thomas Hobbes and William Petty. The political philosophy of Hobbes, for instance, had asserted that individualism and the 'law of nature' must be tempered by a sovereign state. Petty took this idea further, however, in arguing that the job of government was to apply the correct scientific means and practices through which "to secure land and people as economic resources and measures of state power" (p. 54). Petty reasoned therefore that scientific statecraft would involve measures such as calculating the citizenry through political arithmetic, i.e. for purposes of taxation; monitoring the population's health through political medicine; and charting the relevant land and territory through cartography.

Carroll points out that the role of 'engine science' played a big part in the way these ideas were put into practice. Engine science, he argues, informed the 'culture of tools, instruments and engines' which were able to give bureaucratic form to citizens, land and infrastructure (p. 7). As Carroll reasons, "Ireland provided an ideal field for these experiments in statecraft" (p. 56).

Carroll draws in part from Max Weber's (1930) original observation that the particularities of western state formation cannot be understood in their entirety without recourse to the influence of culture. In this way, he reasons that the culture of engine science may have been one of the principal ideas driving the particular form of state that developed in Ireland. Much as Weber argued, Carroll points out that his study demonstrates that by observing the influence of cultural ideas more closely, we can gain a more rounded understanding of social and political phenomena. A central feature of Carroll's argument, for instance, is that scientific expertise was used in an *ideological* way to civilize the population of Ireland. Rather than

synthesizing a nation-state based upon democratic support, Carroll argues, Ireland was crafted through techniques of governmentality.

One of the particular strengths of Carroll's work is his argument that the Ireland of this period exemplified a particular form of statecraft based upon scientific legitimacy. This observation offers interesting insights into the differences between 'building a state' and 'constructing a nation'. As Carroll argues, the material infrastructure of the scientifically informed state building project is still visible in Ireland. However, an Irish nation that predated the influence of English colonialism remained in existence throughout this time, observable through symbols, memories, and cultural artifacts. Carroll suggests that "while the English succeeded in engineering Ireland in their own likeness, they ultimately failed to secure sovereign rule over the entire island" (p. 168). Indeed Carroll's argument provides another angle on the political turbulence that has characterized Anglo-Irish relations in the modern era. The weight that Carroll affords the cultural dimension of the nation-state problematic and how to reconcile the two, echoes the work of sociologists of nationalism such as Smith (1986) and Billig (1995). These two writers have also drawn attention to the importance of considering the ethnic origins of nations and the ways in which the continuing legacy of pre-modern forms of identity have often mitigated against dominant state-building ideas. The former Soviet Union, the former Yugoslavia and the Israel-Palestine conflict, amongst many others, all bear testimony to the problems of integrating pre-modern and modern identities around a particular conception of 'state' that seeks to institutionalize an unequal set of power relations.

The historical link between science and governance is obviously the predominant issue to be drawn from this work where Carroll argues that "the will to knowledge and the will to power are inseparable in the modern period. He points out that 'each directly implies and co-constructs the other'" (p. 174). Carroll's observation certainly holds true in the present where issues such as climate change present a particularly good example of the relationship, and the degree of interconnectedness, that exists between mainstream science and governing institutions, whether at a national or a supranational level. Carroll's book will certainly appeal to sociologists and historians in particular, yet I suggest that its basic argument makes an interesting starting point through which to trace the influence of science upon *contemporary* political institutions and the ways in which the ambiguities in the state-science relationship now play out on a global stage.

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