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University of Exeter

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CYBERNETICS AS NOMAD SCIENCE

andrew pickering

a.r.pickering@exeter.ac.uk

‘Cybernetics as Nomad Science.’ in C. B. Jensen and K. Rödje (eds), *Deleuzian Intersections in Science, Technology and Anthropology* (Oxford: Berghahn Books, 2009), pp. 155-62.

There is a kind of science, or treatment of science, that seems very difficult to classify, whose history is even difficult to follow. . . [I]t uses a hydraulic model . . . inseparable from flows, and flux is reality itself. . . The model in question is one of becoming and heterogeneity, as opposed to the stable, the eternal, the identical, the constant.

Deleuze and Guattari, *A Thousand Plateaus* (1987, 361).

A Thousand Plateaus makes a tantalising distinction between what Deleuze and Guattari call *royal* and *nomad* science. The royal sciences are integral to the established state, while the nomad sciences sweep in from the steppes to undermine and destabilise any settled order. I like the sound of these nomads, but just what is the contrast here, and where can it take us? D&G are, as usual, not entirely clear. I can think of two readings of their story. In the first, the royal/nomad distinction refers in a generalised way to two *phases* of scientific practice. Royal science is finished science, cold, rigid, formalised and finalised, like the state itself—a given repository on which projects of governmentality can draw. Nomad science is instead science in action, research science developing in unforeseeable ways—warm and lively, always liable to upset existing arrangements and to suggest new ones. This would be Bruno Latour’s (1993, 2004) reading, I think, and would feed nicely into his notion of a politics of nature as a rather conservative transformation of the present politico-scientific order.

I am tempted by a more radical reading of D&G. Their point might be that there are two *kinds* of science. The royal sciences would then include classically modern sciences like physics and sociology that have, indeed, been enfolded in projects of state formation and governance since their inception—the very name of the Royal Society of London points us in that direction. But what, then, of nomad science? What could count as examples of this? My idea is that the sciences of complexity, emergence and becoming might fit D&G’s description, but, rather than staying at

the level of generalities, we need a concrete example to examine, and I focus here on just one such science: cybernetics, especially as it developed in Britain after WWII.¹

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There are many different stories about what cybernetics is (or was) and many different political appraisals of it, so let me start by emphasising that I am interested in *one specific strand* of its history, a strand that took the brain as its primary referent, and which can be defined by its specific conception of the brain and its function. The British cyberneticians, in particular, were concerned with the brain not immediately as cognitive but as embodied and performative—as integral to action in the world. And, beyond this, the cybernetic brain was understood as an organ of adaptation, as central to our ability to cope with situations we have not encountered before. One characteristic activity of the first generation of cyberneticians, including Grey Walter and Ross Ashby, was thus the construction of electromechanical adaptive systems—the ‘tortoise’ and the ‘homeostat,’ respectively—understood as scientifically illuminating the mechanisms of the brain. Later work in cybernetics focussed less on the construction of physical models of the brain and more on questions of identity and social relations as conceptualised around a notion of the adaption—here I think of the work of Gregory Bateson, Stafford Beer and Gordon Pask.²

¹ The following discussion of cybernetics is taken from a book I am presently completing, *Ontological Theatre: Cybernetics in Britain, 1940-2000*, and fuller documentation and analysis can be found there. D&G’s discussion of nomad science is to be found at pp 361-74 of *TP*, in ch 12, ‘1227: Treatise on Nomadology—The War Machine.’ D&G’s examples of nomad science cluster around civil engineering (building cathedrals and bridges) thematising an informal, not codified, relation to the world that develops in situ, in the hands of engineer/scientists who constitute a mobile and quasi-autonomous ‘band’ undisciplined by the state (364-64), and I associate these examples with Latour’s finished-science/science-in-action pairing. Latour’s proposals for a ‘politics of nature’ then hinge on incorporating science in action into the political process (without letting go of finished science). But D&G also make an ontologically-based distinction between sciences of laminar and turbulent flows (361-64), the latter being less useful to projects of governmentality. I want to put some flesh on this second notion here. A related ontological question that D&G touch upon is whether we should think of matter as inherently formless, a blank slate upon which we write our designs, or whether science and engineering are better seen in terms of adaptive attempts to enrol the tendencies of matter. D&G of course favour the latter, on which see also DeLanda (2002). D&G ascribe a ‘hylomorphic’ model of matter to the royal sciences (369), while I associate a sort of ‘hylozoism’ with cybernetics (Pickering forthcoming a). I should note that it is possible to tilt the balance in favour of my reading of D&G (and away from the Latourian one). D&G discuss methods of stone-cutting such that the accumulation of stones produces the kind of arch that can support a cathedral, without any over-arching [sic] geometrical vision of the arch. This invites a connection to the mathematics of fractals, cellular automata, simulations of non-linear systems—the unknowable (see below). (Of course, D&G are also talking about the difficulty of abstracting unformalised knowledge from the workers and hence subjecting them to state control. Cf Linebaugh 1992.)

² For more on these individuals, see Pickering (2002, 2004a, b, c, forthcoming b).

I need to say more about the substance of cybernetics, but let me start with its nomadism. Why call cybernetics a nomad science? First, because the cyberneticians were *literally* nomads, wandering around outside established social institutions and career structures for much of their lives. Almost all of the early achievements in British cybernetics were made on an amateur, hobby-ist basis. Grey Walter built his first tortoises at home in 1948; likewise Ross Ashby and his homeostat (a least in the apocryphal version of the story). Ashby referred to his cybernetic work up to about 1950 as his hobby, and the entire development of his cybernetics is recorded in a set of private notebooks he kept from 1928 onwards, while working as a research pathologist in mental hospitals. Beer and Pask's visionary work on biological computers in the late 1950s and early 60s was a spare-time activity for Beer (who ran one of the world's largest industrial OR and cybernetics groups for a living), while Pask's institutional base was his private research and consulting firm, System Research, located in the basement of his family home.³

So cybernetics lived outside the realms of established society, and one corollary of this was its odd mode of transmission. If the royal sciences have their established modes of propagation—undergraduate degrees and postgraduate training—cybernetics advanced instead in a series of chance encounters, often going via popular and semi-popular books. Norbert Wiener's 1948 book, *Cybernetics*, both put the word 'cybernetics' into circulation and convinced many people that they were cyberneticians. In Britain, its appearance led directly to the formation of the so-called Ratio Club, the first self-conscious grouping of British cyberneticians, which characteristically took the form of an informal and private dining club. In robotics, the cybernetic approach of Walter and Ashby was eclipsed by symbolic AI in the early 1960s, only to come back in the 1980s with the situated robotics of Rodney Brooks, now at MIT—and Brooks had read Walter's book, *The Living Brain* (1953) as a schoolboy in Australia. In another field entirely, it was a turning point in his musical career when Brian Eno's mother-in-law lent him a copy of Stafford Beer's book, *Brain of the Firm*, in 1974. He visited Beer several times, and at one point Beer suggested that Eno was the inheritor of the cybernetic mantle (which Eno politely declined).

³ 'It is not that the ambulant sciences are more saturated with irrational procedures, with mystery and magic. . . Rather, what becomes apparent . . . is that the ambulant or nomad sciences do not destine science to take on an autonomous power, or even to have an autonomous development. They do not have the means for that because they subordinate all their operations to the sensible conditions of intuition and construction—*following* the flow of matter, *drawing and linking up* smooth space. Everything is situated in an objective zone of fluctuation that is coextensive with reality itself. . . [T]he experimentation would be open-air, and the construction at ground level' (TP, 373-4).

Sociologically, then, cybernetics wandered around as it evolved, and I should emphasise that an undisciplined wandering of its subject matter was a corollary of that. If PhD programmes keep the royal sciences focussed and on the rails, chance encounters maintained the openness of cybernetics. Beer's *Brain of the Firm* is a dense book on the cybernetics of management, and music appears nowhere in it, but no-one had the power to stop Eno developing Beer's cybernetics however he liked. Ashby's first book, *Design for a Brain* (1952), was all about building synthetic brains, but Christopher Alexander made it the basis for his first book on architecture, *Notes on the Synthesis of Form* (1964). A quick glance at *Naked Lunch* (1959) reveals that William Burroughs was an attentive reader of *The Living Brain*, but Burroughs took cybernetics in directions that would have occurred to no-one else (see also Geiger 2003).

So, cybernetics was strikingly nomadic in at least three interconnected ways: it grew outside the usual institutions of support; it lacked systematic modes of transmission; and it could thus mutate wildly in its development. Deleuze and Guattari (366) speak of the nomad sciences as carried by families and lineages and of the 'secret power' of 'agnatic solidarity' that can 'rise up at any point' (363)—more prosaically one might think of social movements, cults and gurus. But we have not got to the heart of the matter. *Why* did cybernetics live outside the law? In what sense did it promise to destabilise the state? I need to talk about the connection between sociology and ontology.

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Ontology: very crudely, the royal sciences assume that the world is a *knowable* place, and that our relation to it is a cognitive one that goes through knowledge. Our understanding of the hidden structures of the world enables us to submit it to our will in a process that Heidegger (1977) called *enframing*. Historically, this picture has a lot going for it, and one can see that such sciences would hang together nicely with the ambitions of the state. Cybernetics, instead, envisaged a world that was in the end *unknowable*, but to which we can indeed adapt performatively: as I said, cybernetics was a science of adaptation (and *revealing*, to borrow another term from Heidegger). And now I want to distinguish two lines of development of this cybernetic ontology, which map onto a more familiar distinction between what are often called first- and second-order cybernetics.

British cybernetics was the science of the adaptive brain, in two guises, the normal and the pathological, the sane and the mad. Cybernetics emerged, that is, from the matrix of psychiatry, and in its earliest phase the cybernetics of Walter and Ashby ratified, so to speak, the existing psychiatric socio-technical status quo. The period from the 1930s to the 1950s was the age of the ‘great and desperate’ psychiatric cures—chemical and electrical shock therapies and lobotomy—and Walter and Ashby used their electromechanical models both to show how an adaptive brain could become mad (as maladaptation) and how the great and desperate cures might undo that.

I described the cyberneticians earlier as nomads, but here we find them acting just like royal scientists. What should we make of this? Part of the solution to this puzzle would be to see Walter and Ashby’s work as bifurcated between the nomad and the royal. The radical aspect of their cybernetics—electromechanical robots as brain science—evolved, as I said, outside any established social framework, while their understanding of psychiatric therapy remained tied to the traditional institutions where they in fact made their living.⁴ The complication here, as just noted, is that this bifurcation was by no means complete: Walter and Ashby read their cybernetics into a form of psychiatric practice which they treated as simply given. We could, then, take this as an index of the effectiveness of institutions in repelling the nomad—the disruptive aspects of Walter and Ashby’s cybernetics were left largely outside the gates.⁵ We could follow Latour (1993) here, and speak of a certain institutional *purification* of their practice. And it is illuminating in the present context to focus on one aspect of that purification.

I have already noted that a concern with adaptation was the hallmark of British cybernetics, but the institutional framework of British psychiatry from which Ashby and Walter’s cybernetics emerged and to which it returned was anything but adaptive. It was highly asymmetric and hierarchical, seeking to enforce social relations in which the psychiatrists were the only genuine agents, and the patients were literally patients, with no real agency of their own, entirely subject to the psychiatrist’s will.⁶ As Ashby’s horrifying notion of ‘blitz therapy’—the use of hypnosis,

⁴ Almost all of Walter’s working life was spent at the Burden Neurological Institute, where he became one of the world’s leaders in EEG research. Ashby worked at a series of mental hospitals in England, before starting a new career at Heinz von Foerster’s Biological Computing Laboratory at the University of Illinois in 1960, at the age of 57.

⁵ ‘Whenever this primacy [of the ‘man of the State’] is taken for granted, nomad science is portrayed as a prescientific or parascientific or subscientific agency’ (TP, 367).

⁶ Laing (1985) later recalled that in the early days of his career psychiatrists were strongly discouraged from even speaking to schizophrenics.

LSD and electroshock in combination with one another—made clear, the idea was that the patient should adapt to the psychiatrist and not the reverse.

With this in mind, it is interesting to turn to the other line of cybernetic psychiatry which emerged in the 1950s, which undid this asymmetry in taking the concern with adaptation beyond the social circumscription that marked Ashby and Walter's cybernetics. The ex-patriate and highly nomadic Englishman, Gregory Bateson, one of the founding members of the Macy cybernetics conferences in the US, was the key figure here. Bateson understood madness along much the same lines as the other cyberneticians, though he focussed on communication patterns as the site of 'double binds' rather than on brain mechanisms (Bateson et al 1956), but he stepped outside the orbit of Walter and Ashby's models in postulating a further level of adaptability in the human brain. Walter and Ashby understood madness as a jammed cybernetic mechanism that could only be unjammed from the outside, by ECT or whatever (this is how their technical cybernetics was inserted into established psychiatric practice). But Bateson (1961) redescribed psychosis as an 'inner voyage' comparable to an initiation ceremony, in which some 'endogenous dynamics' might sometimes serve to undo double-binds and even lead to inner enlightenment. Under this description, the great and desperate cures of psychiatry appeared as completely misconceived, serving only to block the adaptive inner voyage and leaving patients trapped in their double binds. The prescription instead would be to care for schizophrenics, to help them see such voyages through to their conclusion.

The person who took this reasoning to the limit and symmetrised it even further was the Scottish psychiatrist R D Laing. During the 1960s he arrived at the conclusion that in Modernity we are all mad, in the sense of being cut off from our own inner lives, and therefore the sane can learn from the mad, understood as explorers of inner space. 'We need a place where people . . . can find their way *further* into inner space and time and back again' (Laing 1967, 128). Laing and his Philadelphia Association put this idea into practice at Kingsley Hall in London between 1965 and 1970, and, in the 70s, in a series of communities in Archway, North London.⁷ At Kingsley Hall, psychiatrists and schizophrenics, as well as artists and dancers, lived symmetrically

⁷ There are no very good scholarly sources on Kingsley Hall. The only book-length account, Barnes and Berke (1971), is very much focussed on the experience of its authors. Sigal (1976) is a wonderful fictional account. The Archway communities are better documented. See, for example, Burns (2002) and Peter Robinson's documentary film, *Asylum* (1972). Guattari himself worked at a similarly radical institution, the psychiatric clinic La Borde, south of Paris (Guattari 1984, 2). 'The aim at la Borde was to abolish the hierarchy between doctor and patient in favour of an interactive group dynamic that would bring the experiences of both to full expression in such a way as to produce a collective critique of the power relations of society as a whole' (Massumi's foreword to *TP*, x).

together, the sane providing a support community for the mad, reciprocally adapting to their often bizarre behaviours rather than prescribing electroshock treatment, and, at the same time, becoming something new themselves (even, at Archway, sometimes entering into their own inner voyages).

And this is the point I wanted to arrive at. Kingsley Hall is the best exemplification I can come up with of a destabilising nomad science in action. Taken to the limit, the cybernetic ontology of unknowability and adaptation hung together at Kingsley Hall with a radical transformation of social relations and institutional forms. And the socially disruptive force of cybernetics as nomad science is thematised here by the fact that Kingsley Hall grew out of David Cooper's earlier Villa 21 project, which had aimed to implement symmetric relations between doctors and patients *within* an established mental hospital (Cooper 1967). The institutional frictions between Villa 21 and the rest of the hospital fed directly into the decision of the Philadelphia Foundation to operate entirely *outside* the established mental health system in England. We can thus see that cybernetics was a *different kind* of science from the royal sciences of discipline and governance, and that as elaborated by Bateson and Laing it invited a *different kind* of social organisation—a self-organising and adaptive institutional form quite different from the state form of hierarchical command and control.

So, this cybernetic anti-psychiatry is my way of putting flesh on the radical reading of D&G's idea of nomad science—my way of thinking through what they could possibly have had in my mind—and I want to close with a few brief remarks on it. First, we can see that in this version cybernetics had a radical political edge, entailing the abandonment of a well entrenched institution of state governance. Second, we might note that the influence of Kingsley Hall extended well beyond psychiatry. The Kingsley Hall community was itself a key element of the 60s counter-culture in Britain. with all its well known challenges to established forms of life. The Philadelphia Association sponsored the Dialectics of Liberation Congress held at the Roundhouse in London over three weeks in 1967, which brought together many of the luminaries of the counter-culture in Europe and the US, including Allen Ginsberg, Gregory Bateson, Emmett Grogan, Simon Vinkenoog, Julian Beck, Michael X, Stokely Carmichael, Alexander Trocchi, Herbert Marcuse and Timothy Leary. Kingsley Hall was also the model for the anti-University of London—a radical and anti-hierarchical formation which seems to have foundered when the students decided to charge the lecturers for the privilege of teaching them (Green 1988).

But third, I want to mention D&G's idea that the royal and the nomad sciences have a mutually constitutive relation. History, according to D&G, has the quality of an *interplay* between the state and the nomad. The nomad supplies a transformative dynamic, upsetting state formations, which are then reconstituted on a new basis, only to be nomadically disrupted again, and so on. The state adapts to the nomad.⁸ That kind of interplay has been, at best, only partial in the postwar history of cybernetics. If robotics is different since the work of Walter and Ashby, psychiatry is not. Ashby and Walter themselves domesticated their cybernetics to their institutional milieu, while Kingsley Hall had little effect on psychiatric practice more broadly. The only institutionalised change since the 1950s has been the rise of pharmaceuticals instead of ECT and lobotomy as our chosen means of blocking inner voyages at the expense of reciprocal adaptation. Over the last forty years, brute exclusion and forgetting rather than interplay has become our rule for coping with the nomads at the level of the state. Maybe that has something to do with the grimness of the world we now find ourselves in.

⁸ For example, '[A]mbulant procedures and processes are necessarily tied to a striated space—always formalised by royal science—which deprives them of their model, submits them to its own model, and allows them to exist only in the capacity of “technologies” or “applied science.” . . . There is a type of ambulant scientist whom State scientists are forever fighting or integrating or allying with, even going so far as to propose a minor position for them within the legal system of science and technology. . . . [T]he ambulant sciences quickly overstep the bounds of calculation; they inhabit that “more” that exceeds the space of reproduction and soon run into problems that are insurmountable from that point of view; they eventually resolve those problems by means of a real-life operation . . . Only royal science, in contrast, has at its disposal a metric power that can define a conceptual apparatus or an autonomy of science . . . That is why it is necessary to couple ambulant spaces with a space of homogeneity, without which the laws of physics would depend on particular points in space. . . . This is somewhat like intuition and intelligence in Bergson, where only intelligence has the scientific means to solve formally the problems posed by intuition, problems that intuition would be content to entrust to the qualitative activities of a humanity engaged in *following* matter' (D&G, 372-74).

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