

SYMPOSIUM

Actor-Network Theory, Marxist Economics, and Marxist Political Ecology*

Alan P. Rudy and Brian J. Gareau

Science and technology studies have generated increasing interest within Marxist circles. In this symposium, we focus on Actor-Network Theory, a topic that has, at times, sparked misguided debate due to misunderstanding on both sides. On the whole, though, green Marxisms and ANT have maintained relative distance from each other. The articles in this symposium seek to narrow the gap. Whether considering Marx's deep concerns with the natural sciences, metabolic socionatural relations, and "natural" obstacles to capital,¹ Marx's discussion of constant capital's contribution to maintaining capital's "monopoly of property [in] and access to the material means of production,"² or Engels' attempt at creating a single, social-natural ontology in the *Dialectics of Nature*,³ Marxism has a deep historical concern with relations between natures, sciences, technologies and societies. These traditions are, of course, intertwined with the history of critical science studies, which assessed the contradictions of the hegemony of technoscientific and industrial power over sociopolitical and aesthetic values;⁴ the enforced irrationality of alternatives to scientific and political technics;⁵ the relationship between declining environmental conditions, economic productivity and social quality of life;⁶ the ways the domination of nature served as a means of social domination;⁷ the character of science as social relations and labor processes;⁸ the idea of nature, the production of nature, and their relation to history, science and capitalism;⁹ and science as politics.¹⁰

More recently, as Marxists have sought to deal with environmental crises and issues of the production and construction of natures, questions of science and technology have proven unavoidable, as evidenced by the number of articles on this topic in the first volumes

* The participants thank Barbara Laurence. The symposium came about because of her interest, prodding and persistence, all of which were much appreciated.

¹ John Foster and Paul Burkett, "Ecological Economics and Classical Marxism," *Organization & Environment*, 17, 1, 2004, pp. 32-60; Ted Benton, "Marxism and Natural Limits," *New Left Review*, 178, 1989, pp. 51-86; Susan Mann and James Dickinson, "Obstacles to Development of a Capitalist Agriculture," *Journal of Peasant Studies*, 5, 4, 1978, pp. 466-81.

² Ernst Mandel, "Introduction," in Karl Marx, *Capital*, Vol. I (New York: Vintage, 1977 [1867]), p. 33.

³ Frederick Engels, "Dialectics of Nature," in Karl Marx and Frederick Engels, *Collected Works*, Vol. 25 (New York: International Publishers, 1987 [1883]), pp. 313-590; Angus Taylor, "Dialectics of Nature or Dialectics of Practice?" *Dialectical Anthropology*, 4, 4, 1979, pp. 289-308; Richard Levins and Richard Lewontin, *The Dialectical Biologist* (Cambridge, MA: Harvard University Press, 1985).

⁴ Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment* (New York: Continuum, 1988 [1944]).

⁵ Herbert Marcuse, *One Dimensional Man* (Boston: Beacon Press, 1966).

⁶ Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Knopf, 1971).

⁷ William Leiss, *The Domination of Nature* (New York: G. Braziller, 1972).

⁸ Robert Young, "Science Is Social Relations," *Radical Science Journal*, 5, 1977, pp. 65-129; Robert Young, "Science Is a Labor Process," *Science for the People*, 43/44, 1979, pp. 31-37.

⁹ Raymond Williams, "Ideas of Nature," in *Problems in Materialism and Culture* (London: Verso, 1980), pp. 67-85; Neil Smith, *Uneven Development* (New York: Blackwell, 1984).

¹⁰ Les Levidow, *Science as Politics* (London: Free Association Books, 1986).

of this journal. However, discussions of nature, the environment, science, and technology have tended to focus on issues internal to the Marxist tradition, where materialism (quite properly) rules the roost. By contrast, and particularly since 1980, critical science and technology studies have focused on an alternative material abstraction, that of technoscience.¹¹ It is the scholarship relative to technoscience—rather than science and technology—that has reverberated across critical political ecology over the last decade and a half.¹² Of course, technoscience studies are not unitary. They can be generally broken into three internally differentiated, but nevertheless competing forms—all of which tend to be quite critical of Marxism and political economy more generally: 1) those of sociological constructivisms¹³ 2) socialist and interactionist feminist studies of science, technology, and medicine,¹⁴ and 3) actor-network theory.¹⁵

The materialism of Marxist political ecology has long engaged in critical—if not always fair—discussions of (social) constructivism. At the same time, Marxist political ecologists have largely ignored or been silent in the face of feminist science studies. By contrast, Actor-Network Theory (ANT) has been embraced fairly widely by critical political ecologists, many of whom had previously embraced forms of Marxist analysis. With the publication in 2004 of Bruno Latour's *The Politics of Nature*, ANT ventured into political ecological terrain.¹⁶ A little earlier, it had moved from studies of technoscience into the

¹¹ Bruno Latour, *Science in Action* (Cambridge, MA: Harvard University Press, 1987); Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993); Bruno Latour, *Pandora's Hope* (Cambridge, MA: Harvard University Press, 1999a); Donna Haraway, *Primate Visions* (New York: Routledge, 1989); Donna Haraway, *Simians, Cyborgs and Women* (London: Free Association, 1991); Donna Haraway, *Modest_Witness@Second_Millennium_Femaleman_Meets_Oncomouse* (New York: Routledge, 1997); John Law, *A Sociology of Monsters* (London: Routledge, 1991); John Law, *Organizing Modernity* (Oxford: Blackwell, 1994); Adele Clarke and Joan H. Fujimura, *The Right Tools for the Job* (Princeton, N.J.: Princeton University Press, 1992); Andrew Pickering, *Science as Practice and Culture* (Chicago: University of Chicago Press, 1992); Andrew Pickering, *The Mangle of Practice* (Chicago: University of Chicago Press, 1995); Geoffrey Bowker and Susan Leigh Star, *Sorting Things Out* (Cambridge, MA: MIT Press, 1999); Joseph Rouse, *Engaging Science* (Ithaca, NY: Cornell University Press, 1996); Sandra Harding, (ed.), *The Feminist Standpoint Theory Reader* (New York: Routledge, 2004); Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump* (Princeton, N.J.: Princeton University Press, 1985); Langdon Winner, *The Whale and the Reactor* (Chicago: University of Chicago Press, 1986).

¹² Sarah Whatmore, *Hybrid Geographies* (London: Sage, 2002); Peter Taylor, "How Do We Know We Have Global Environmental Problems?" in P. Taylor, S. Halfon and P. Edwards (eds.), *Changing Life* (Minneapolis, MN: University of Minnesota Press, 1997), pp. 149-74; Bruce Braun and Noel Castree, *Remaking Reality* (London and New York: Routledge, 1998); Arturo Escobar, "After Nature," *Current Anthropology*, 40, 1, 1999, pp. 1-30; Monica Casper, "At the Margins of Humanity," *Science, Technology & Human Values*, 19, 3, 1994, pp. 307-23; Timothy Luke, *Ecocritique* (Minneapolis: University of Minnesota Press, 1997); William Cronon, *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W.W. Norton & Co., 1995); Tim Forsyth, *Critical Political Ecology* (London: Routledge, 2003).

¹³ David Bloor, *Knowledge and Social Imagery* (Chicago: University of Chicago Press, 1991); Barry Barnes, David Bloor and John Henry, *Scientific Knowledge* (Chicago: University of Chicago Press, 1996).

¹⁴ Haraway, 1991, *op. cit.*; Emily Martin, *Flexible Bodies* (Boston: Beacon Press, 1994); Joan Fujimura, *Crafting Science* (Cambridge, MA: Harvard University Press, 1996); Monica Casper, *The Making of the Unborn Patient* (New Brunswick, NJ: Rutgers University Press, 1998).

¹⁵ John Law, "On the Methods of Long-Distance Control," in John Law (ed.), *Power, Action and Belief* (London: Routledge & Kegan Paul, 1986), pp. 234-63; Bruno Latour, "On Recalling Ant," in J. Law and J. Hassard (eds.), *Actor Network Theory and After* (Oxford: Blackwell, 1999b), pp. 15-25; Bruno Latour, "When Things Strike Back," *British Journal of Sociology*, 51, 1, 2002a, pp. 107-124; Bruno Latour, *War of the Worlds: What About Peace?* (Chicago: Prickly Paradigm Press, 2002b).

¹⁶ Bruno Latour, *The Politics of Nature* (Cambridge, MA: Harvard University Press, 2004).

analysis of economics.¹⁷ While ANT has been regularly engaged within Marxist geography,¹⁸ *CNS* has had little to say about it. Following on Wainwright's¹⁹ recent review of *The Politics of Nature* in these pages, we seek to intensify the focus.

ANT remains rather poorly understood by most Marxists, most of whom are critical realists of one stripe or another. Peter Dickens, for example, categorizes and dismisses both Bruno Latour and Donna Haraway as "social constructivists." Dickens suggests that: "[a]ccording to this view, there is no reality at all independent of power and language. It is all social construction.²⁰ At the same time, ecological Marxism seems to exist only in negative space for "ANTers." Here, Sarah Whatmore claims that Marxism views nature as an effect of human power/agency, on the one hand, and unavoidably distinct from humans in theory and practice, on the other.²¹ Neither Dickens' nor Whatmore's analysis is accurate or fair. A more interrogative reading, in both directions, sheds light on the contributions each might make to the other.

Fine, Rudy and Gareau have different approaches to ANT. Appropriately, each presents the methodology somewhat differently.²² But the three generally agree on what ANT is, what it is trying to do, and the consistency of its major flaws. Briefly, ANT is a non-modern relational mode of analysis. The non-modern core of ANT focuses on a reasonable frustration with the many reified dualisms, from nature-society to science-politics, subject-object, and macro-micro attributed to Enlightenment, science, and philosophy. Quite properly, ANT is interested in the material articulations and semiotic assemblages upon which an assumed-to-be asocial nature and equally un-natural society depend.²³ In Marxist parlance, it possesses a materialist conception of history. Further, adherents to ANT refuse to assume that subjects are uniquely active and objects are unavoidably passive in relations between (social) agents and (natural) conditions or (science-based) technologies. However, as is so often noted, ANT takes the strong stance that humans, natures, and technologies ought to be treated—at least initially—as equal participants, which are all enrolled in a network and which (may) contribute in a mutually constitutive fashion to the generation of the world as

¹⁷ Michel Callon, "An Essay on Framing and Overflowing," in M. Callon (ed.), *The Laws of the Markets* (Oxford: Blackwell, 1998), pp. 244-69; Michel Callon, "Introduction: The Embeddedness of Economic Markets in Economics," in M. Callon (ed.), *ibid.*; Michel Callon, Cecile Meadel, and Vololona Rabeharisoa, "The Economy of Qualities," *Economy and Society*, 31, 2, 2002, pp. 194-217.

¹⁸ Erik Swyngedouw, "Power, Nature, and the City," *Environment and Planning A*, 29, 2, 1997, pp. 311-32; Noel Castree, "False Antitheses?" *Antipode*, 34, 1, 2002, pp. 111-46; Neil Smith, "Nature at the Millennium," in B. Braun and N. Castree (eds.), *Remaking Reality* (London: Routledge, 1998), pp. xiv, 295; Julie Guthman, "Commodified Meanings, Meaningful Commodities," *Sociologia Ruralis*, 42, 4, 2002, pp. 295-311.

¹⁹ Joel Wainwright, "Politics of Nature: A Review of Three Recent Works by Bruno Latour," *Capitalism Nature Socialism*, 16, 1, 2005, pp. 115-22.

²⁰ Peter Dickens, *Society and Nature* (Malden MA: Polity Press, 2004), p. 19.

²¹ Sarah Whatmore, "Hybrid Geographies," in D. Massey, J. Allen and P. Sarre (eds.), *Human Geography Today* (Cambridge: Polity Press, 1999), pp. 24-39; Sarah Whatmore, "Dissecting the Autonomous Self," *Environment and Planning D*, 15, 1, 1997, pp. 37-53.

²² For those interested in overarching, if somewhat incompatible, reviews of ANT and its utility, the following represent fair interpretations: Castree, 2002, *op. cit.*; Swyngedouw, 1997, *op. cit.*; Kerry Whiteside, *Divided Natures* (Cambridge, MA: MIT Press, 2002); David Bloor, "Anti-Latour," *Studies in the History and Philosophy of Science*, 30, 1, 1999, pp. 81-112; Bruno Latour, 1999b, *op. cit.*, pp. 15-25; Andrew Pickering, "The Objects of Sociology: A Response to Breslau's 'Sociology after Humanism,'" *Sociological Theory*, 18, 2, 2000, pp. 308-16.

²³ Recently Kate Soper also discussed this imbroglio in Marxian terms in *CNS*. Kate Soper, "Thinking the Unnatural," *Capitalism Nature Socialism*, 16, 1, 2005, pp. 129-34.

we know and relate to it. The point is to stress the symmetrical study of controversial and normal science as well as the human and non-human contributions to technoscience.²⁴ Here, the opposition to reification in ANT is as much about desocialization as it is about denaturalization.

ANT emerged primarily from Latour's work in the late 1970s and throughout the 1980s in laboratory and science studies. The focus in this work was on following engineers and scientists in order to assess the means by which they enroll technological objects, natural processes, biological entities, and other human actors in their projects—a variant, up to a point, of treating science as a labor process.²⁵ Stabilized networks of enrolled actants, assemblages of humans and non-humans, particularly those capable of being extended widely across space, are seen as “black-boxed” “immutable mobiles” with power that can be sustainably expressed in widely dispersed and diverse places. Power, in this quasi-Foucauldian approach, is a network effect, not something wielded by social individuals over objectified others or natures. A core problem with modernity for Latour and ANT is that it generates ever-greater numbers of socionatural hybrids but insists on categorically purifying each hybrid so that it may be defined as Natural or Social. For Latour, the conception of Nature and Society as separate entities is fictitious. Rather they represent networked associations of actants meeting “in the middle.”²⁶

Among other things, ANT seeks to resolve the debate between realists and constructivists by viewing Nature and Society not as poles in a dualism but as symmetrical products of modernist articulations of the human and non-human. Nature is neither passively real—so as to be actively represented by science—nor the product of social activity, merely a social construction.²⁷ Technoscience, then, is the dynamic process of give and take between humans and non-humans, including machines.

As Breslau notes:

For actor-network, symmetry is not a way of bringing in nonhumans, but a way of abolishing a set of groundless *a priori* divides between types of agents and between metaphysical properties. The distinction between humans and others is constructed, as is that between immanence and transcendence. Thus, Jones is accurate in discussing actor-network as a realist semiotics [I]t refuses any unbridgeable gulf between signs and a more fundamental but inaccessible real world.²⁸

This position is important for two reasons: 1) it provides non-human objects with a more active role in shaping socionatural relations, and 2) methodologically, it emphasizes the accommodations that must be made by, to, and within technoscientific relations as they are

²⁴ For polemical clarifications of the issues here, see the exchange between Collins and Yearley, Woolgar, Callon and Latour in Pickering, 1992, *op. cit.*, pp. 301-389.

²⁵ Young, 1979, *op. cit.*

²⁶ Latour, 1993, *op. cit.*, p. 37.

²⁷ Here, Peter Dickens attempt at a critical realist reading of Latour goes awry. See Peter Dickens, *Society and Nature* (Malden MA: Polity Press, 2004) p.19).

²⁸ Latour, 1993, *op. cit.* pp. 37-38. See also Daniel Breslau, “Sociology after Humanism: A Lesson from Contemporary Science Studies,” *Sociological Theory*, 18, 2, 2000.

generated and extended in time and space.²⁹ Yet, by emphasizing the power of technoscientific relations—and therefore preferentially opening its black boxes—Latour and ANT have a tendency to background many of the sociopolitical worlds (and their inequities) associated with, supported by, and always infusing technoscience.

ANT is interested in the symmetrical contributions of humans and non-humans to technoscientific articulations, and for those purposes, it chooses to treat human agency in a non-judgmental way and effectively equate it to non-human agency. But ANT's assumption of homogeneity between human and natural agency is problematic.³⁰ The goal, as Callon explains, is to permit “an explanation of how a few obtain the right to express and to represent the many silent actors of the social and natural worlds they have mobilized.” However, this partial symmetry, where a few (humans) still express and represent silent humans and non-humans, has fallen increasingly by the wayside in the subsequent development of ANT and its ontology.³¹

The following articles will illustrate the problems ANT creates in its attempt to ameliorate the dichotomies of Enlightenment thought, the potential contribution that ANT provides to Marxist political ecology, and the new directions in which political ecology can and must move in order to maintain its salient presence today.

²⁹ “To call a claim ‘absurd’ or knowledge ‘accurate’ has no more meaning than to call a smuggler trail ‘illogical’ and a freeway ‘logical.’ The only things we want to know about these sociological pathways are where they lead to, how many people go along them with what sort of vehicles, and how easy they are to travel; not if they are wrong or right.” Bruno Latour, 1987, *op. cit.* Once again, the concerns of eco-Marxists run parallel to ANT. What appears “rational” to one group or body may appear “irrational” to another. For James O’Connor that dominant economic logic is capital, one that displaces rationales of cultures and communities not driven by individualism and profit: “Each of these economies was “rational” from the standpoint of the participants’ cultural values. Today... the old connections between culture, labor, and nature are now history.” See James O’Connor, *Natural Causes* (New York: Guilford, 1998), p. 84.

³⁰ Andrew Pickering, *The Mangle of Practice: Time, Agency, and Science* (London: The University of Chicago Press, 1995); E. Laurier and C. Philo, “X-Morphising: A Review Essay of Aramis,” *Environment & Planning A*, 31, 1999, pp. 1047-73; Noel Castree, “False Antitheses? Marxism, Nature and Actor-Networks,” *Antipode*, 34, 1, 2002, pp. 111-46.

³¹ Michel Callon, “Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay,” in John Law (ed.), *Power, Action and Belief* (London: Routledge & Kegan Paul, 1986), p.224; Daniel Kleinman comments that ANT is incapable of noting that “the benefits of relations [between actors and objects] may be asymmetrical.” May, might be too weak a term. See Daniel Kleinman, “Untangling Context: Understanding a University Laboratory in the Commercial World,” *Science, Technology, & Human Values*, 23, 3, 1998, p.289.