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EMPIRE

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Science fiction and technoscientific empire

Sf is gradually gaining acceptance as a significant arena of cultural mediation for the regime of globalizing hypermodernism. Throughout much of the twentieth century, Euro-American cultural elites considered the themes and icons that made up sf's megatext (the large and mutable body of references that most sf artists and audiences consider to be the shared subcultural thesaurus of the genre) embodied in literary fiction, visual art, cinema, comics, music, and games, as the obsessions of a small technophilic subculture on the periphery of mainstream humanism.

Looking back at the century, it has become difficult to sustain that view. Sf artists have played an important role in articulating some of the powerful trends that shaped the political and cultural consciousness of the age. Foremost among the literary genres, sf imagined the possibilities of radical historical transformations resulting from technological innovation applied to social life. It negotiated the relationships among these transformations and the ethical myths of earlier phases of Western culture. It simultaneously interpreted and shaped the ideology of technoscience, that is, of science in the service of the technological rationalization of every domain of material existence. For the political imagination, sf created tools with which audiences could imagine the steady consolidation of technoscientific hegemony, defined by the drive to construct a universal regime of technoscience – hyper-global, extending beyond the limits of known space and mortality, containing an infinite variety of sublime and grotesque possibilities, and guided by a transglobal technocratic elite with lax ties to traditional historical communities, for whom the technological transmutation of once-universally held human truths is an inexorable given. Sf has shaped the contours of a new social-political imaginary tied not to personal rulers, nations, and territories, but to the utopian vision of the consolidation of existence into one world, one polity, and one mode of awareness, through the expansion of technological rationalization: a technoscientific empire.

I would like to look at some contours of this mediation, considering four of its main intersecting concepts: the "air-mindedness" that attended the popular enthusiasm for heavier-than-air flight; the vision of a single, globe-uniting, technocentric "One State"; the dissolution of traditional being, human and others, breaching ontological boundaries about the notion of existence, and the production of new fusions of "cyborg" beings as a result of technoscientific redescriptions and splices; and, finally, the drive to escape from the limits of physical containment and mortality, from the personal body and species biology, by attaining "escape velocity" in the acceleration of technological transformation. These world-models, derived from visions of the future, have contributed significantly to the sense that political legitimacy is also derived from a future yet to be constructed by technoscientific solutions for which the present must pay forward.

Technology, imperialism, and empire

Discourse about the cultural dimensions of imperialism has undergone several changes. The classical sense that the term refers to the competitive global expansionism of European national powers that reached its formal end with the First World War, gave way to a looser conception that covered the continuing maintenance of colonial rule in the interwar and post-Second World War periods. As the perspective of anti-colonial movements gained authority after the Second World War, the term was further expanded to cover neo-colonial arrangements among the erstwhile national empires, based less on direct political control over colonies than on the manipulation of their economies via financial networks based in the former capitals. Distributed through a world-system of economic exploitation dominated by national military-industrial complexes, the neo-colonial sense of imperialism is complemented by, adapting Paul Virilio's phrase, "endocolonialism," the extension of the dominating network to the "home country" and its cities, and to the national subject itself (see Virilio 1995). In the work of Michael Hardt and Antonio Negri (2000), the concept of imperialism has been superseded by the notion of empire achieved – "imperialism" marking the historical stage of striving to achieve forms of international domination, "empire" marking its achievement as a transnational regime of finance capitalism controlling a far-flung network of biological resources (foremost among them human labor) through elaborate interlocking mechanisms of communication and weapons.

Until recently, surprisingly little attention was paid in this discussion to the invention, distribution, and legitimation of diverse, interlocking systems of technological innovation and organization. Yet the decline of the classically imperialist projects created the conditions for their succession by a new project of deterritorialized supranational dominance guided by a technocratic elite with stronger ties to post-Enlightenment technological development than to national histories. This regime has depended on the residues of political power of its imperialist predecessors. In the twentieth century nation-states came increasingly to depend on technological development to maintain their legitimacy, and to survive. Yet within the technoscientific elites there was no necessary commitment to pre-imperial national values or even ideological axioms. The ruling orders of this regime owe their loyalty to visions of a "post-historical" future, in which technological rationalization will solve the archaic concerns of scarcity and human disequilibrium. Their goal, and also their dwelling place, is a technological empire, whose systems of communication, commodification,

and control infiltrate, and indeed saturate, all formerly "natural" relationships, from the institutional to the biological.

There can be no doubt that without constantly accelerating technological innovation imperialism could not have had the force it did, or progressed so rapidly. Without steamships and gunboats, repeating rifles and machine guns, submarine cables, telegraph lines, and anti-malarial medicines, the power of imperial adventurers would have been greatly limited, and perhaps not even possible (see Headrick 1981). But imperial technology was not only a set of tools for exploiting colonies. Imperial future shock blew back into the colonial center, consolidating a new idea of political power linked to technological momentum, essentially colonizing the homeland too, and at a speed that made resistance futile (see Arendt 1951: 136–8; Adas 1989: 365–6; Hughes 1994). Each global success brought power and money to technological projects, creating a logrolling effect that drove irrational political and economic exploitation in grand-scale uncontrolled social experiments. It also fueled ever more focused and complex momentum – until social conflicts, both within and beyond the national borders, could be seen as politically manageable only through technological means. With imperialism, politics became technological.

The suicidal exhaustion of the imperialist world-system in the First World War revealed the degree to which national political power had become a function of technology's power to correlate different domains of social existence. In Walter Rathenau's civil and military mobilization of Germany, modern political elites discerned how quickly and thoroughly industrial projects could be directed, managed, and synchronized; how invention and discovery could be institutionalized; how more and more aspects of social life could be brought under the umbrella of technosocial organization, at an ever-accelerating pace; and how the political charge of these processes could be concealed and sublimated into the ideology of technological development – all inspired, designed, and overseen by scientific knowledge directed toward large-scale technological applications. In sum, political technoscience (see Henderson 1951). The conversion of politics into matters of technique had begun with the need to find solutions to imperial problems, without challenging the political legitimacy of domination. This became a central aspect of all conceptions of the high modernist state.

In the process, technoscience consolidated into a semi-independent sphere connected to overtly political ideology. It did not matter ultimately to its institutions which form of government insured the penetration and transformation of material existence by scientific materialism, so long as its power was obeyed. Soviet Stakhanovism and the Five-Year Plans, civil defense and public works of the Nazi war economy, the New Deal and Marshall Plan reconstruction agendas, the Soviet and US space programs, all were alibis for hypermodernization. Indeed, technoscience developed as an envelope for political power in the twentieth century. Technoscience has inspired faith independent of partisan political commitments, preventing most critiques within political elites, indeed even the effort to find alternative terms of discourse. An invisible imaginary regime takes shape, one for which national borders are secondary obstacles. It is an Enlightened empire of shared commitments to

instrumentality, justified by its promise of ever-greater rationality and material abundance in the future, a future in which new ideas consistently produce new realities that consistently produce new resources, managed by technoscientific means, stimulated by technoscientific innovation and discovery, sustained by technoscientific machinery, and heading off the potentially catastrophic consequences of its practices through internal critique, new invention, and new discovery – the actually existing sf of a technoscientific regime on the verge of global consolidation and expansion into space. It is a world in which technological problems require technological solutions – and all problems are technological.

This imaginary utopian regime, ostensibly nonpolitical and international in fact, has facilitated the extension of capitalism into its current global phase, in which the uneasy balance of nations and international institutions serves the interests of the heirs of earlier imperialism. Flexible boundaries and transnational flows – of capital, populations, techniques, and cultures – and the constant transformation of human bodies and subjectivities via world-scale experiments in technoscientific rationalization facilitate unfettered capitalism's inherently alienating and nonmaterialist dynamism. Perennial apocalypse and constant crisis (the most dependable of all generators of wealth for the few); an avalanche of nova and discordances; a maximum of sublime and grotesque fascinations to prevent routines, habits, and stable loyalties from taking root – all create a state of perpetual challenge that only yet-to-be-imagined technoscientific solutions can address.

It is under these conditions that sf has become established as a popular, visionary genre of art. It emerged addressing a new elite, not the traditional "organic" ruling castes, nor the bourgeois intelligentsia and merchant-adventurers. It spoke to engineers, scientists, and technicians, many of them immigrants to the imperial city centers, many of them with no great allegiance to traditional systems of education and cultural privilege. "Science," in the 1920s, became the institution and sacred knowledge that could redeem the miserable failures of national projects. It is striking – especially after the technological barbarism of the First World War – how much quasi-religious fervor went into visions of technoscientific salvation in Europe and the US. These included dreams of scientific Marxism such as J.D. Bernal's future humanity, living in material and literal "ecstasy" in the form of modular cyborgs with superior perceptual mechanisms and literal telepathy via direct radio communication, brain to brain; the visions of German national redemption and revenge through rocket science (see Winter 1983: 35–54 and Fischer 1991); American fantasies of superweapons and utopian cities (see Franklin 1988); and Konstantin Tsiolkovsky's rocket mysticism, destined to realize humanity's purpose of expanding into the universe, the principles of Russian Cosmism (see Hagemseister 1997 and Lykin *et al.* 1995).

Air-mindedness

To the early twentieth century, mechanical flight seemed to offer a material means to overcome earthboundedness. Popular fascination with airships was manifest in glider clubs and rocket societies, airshows and air races, and highly publicized feats of speed

and endurance. Flight was also quickly recognized by states and political parties as a political imperative; the development of more powerful and effective airships became interests of state and national pride.

Preconditions for these interests had been set already in the eighteenth century, as modernizing governments began to map their territories for the purposes of taxation and rationalized agriculture (see Scott 1998: 11–52). These maps enabled states to survey lands as if from the air, and to dominate them with imaginary surveillance. Balloon, glider, and Zeppelin technologies later added the popular charge of easy travel through the stratosphere. In the twentieth century, sf art, such as *Buck Rogers* comics (1929–67) and the pulp covers of Frank Paul, as well as films such as *Metropolis* (Lang 1927) and *Just Imagine* (Butler 1930), depicted future cities in which airplanes would be as plentiful and personalized as automobiles, and cities were constructed vertically to accommodate their three-dimensional traffic. In the Soviet Union, "air-mindedness" was expected to further the diffusion of communism through the vast agrarian and wilderness regions otherwise inaccessible to modernizing communications (see Palmer 2006: 79–159). Germans, in particular, came to associate their national identity with the technology of flight – "the flight of eagles" – that Hitler nurtured with enthusiasm and consummate propagandistic inventiveness (see Fritzsche 1992).

The most powerful impetus to air-mindedness, however, was war. Verne had imagined the destructive potentials of attacking cities from the air in his *The Master of the World* (1904). Wells in *The War in the Air* (1908) and *The World Set Free* (1914) predicted that such air-ground wars would be inevitable and cataclysmic. German and Russian governments were particularly moved by Wells's fiction to begin large-scale research and development programs to devise programs for managing air wars. The British transformed the RAF into an instrument for policing its restive colonies (see Omissi 1990). US imperial ambitions were stimulated by the dream of air command more than any other nation; the US based the military dimension of its post-Second World War *pax Americana* on air power and superweapons of mass destruction, "smart bombs," and scattered air bases with little connection to ground support, allowing it to extend military power far from the imperial center, without terrestrial lines of supply (see Press 2001; Sherry 1989; Pape 2004). Air-carried superweapons had been a staple of future-war sf throughout the century; indeed, sf had all but mandated their development in *The World Set Free*, in which Wells imagined airborne nuclear bombs dropped on European cities. Sf writers pursued their professional obligation to imagine diverse innovations by depicting bombs carrying germs, poison gases, mind-altering drugs, anti-matter, and nanophages.

Early sf made it clear that flight could be imaginatively extended to spaceflight with little effort. The experiences of air-ground wars – bombed cities, air-minded societies, dual-use combat/transport fleets – became models for concrete, detailed visions of political and social life for humanity as it expanded into outer space. Rocket societies of amateur aerodynamic engineers proliferated early in the twentieth century, in the US, France, Britain, Germany, and Russia. All advocated the application of state resources to the subvention of spaceflight, and all were influenced by imaginary models derived from sf – from Verne, in the case of the American Robert Goddard and

the Russian Tsiolkovsky, from Kurd Lasswitz in the case of Willy Ley and Wernher von Braun. Sf's space stations and planetary colonies were modeled on forward military outposts evolving into imperial cities. The large body of sf works imagining human expansion into space was tied to the image of military/colonial settlements – either to escape from an ever-hungry terrestrial techno-political world-system, or precisely to serve such a power.

It is no wonder then that the counterforce has been imagined as itself coming from outer space. In this role, the alien appears either as a competitor for control over space and time, or as an enlightened obstacle to the sins of technologically facilitated expansion. In its techno-imperialist variant, the alien is the ultimate justification for technoscientific.power – from *Flash Gordon* comics (1934–2003) to *Independence Day* (Emmerich 1996), sf has depicted the need of the human species to band together to protect itself against alien invaders or challengers of its colonial installations. In its anti-imperialist variants, aliens appear as life-saving obstacles to this process. In *The Day the Earth Stood Still* (Wise 1951), an enlightened extraterrestrial arrives with an ultimatum: either give up nuclear weapons or have a world-destroying robot, the consummate expression of the alien technological development, destroy the Earth itself. Sophisticated variants of this theme depict the alien invader from the skies as a metaphor for humanity's own technological development. In Wells's *The War of the Worlds* (1898) and its many successors, the air-ground war against human civilization is waged by versions of humanity's own hypertechnological descendants, as if they were attacking their own origins through time. Sf also depicts the self-destructive corruption of such war strategies, in works such as Joe Haldeman's *The Forever War* (1974), Orson Scott Card's *Ender's Game* (1985), Stanisław Lem's *Fiasco* (1986), Eleanor Arnason's *Ring of Swords* (1993), and the corrupting effect of developing alien resources for war in the *Alien* (1979–97) films.

These themes articulate the imaginary negotiation of technological development, not only in real terms, through the implications for social life of widespread air technology and spaceflight, but in their symbolic implications: the increasing distance of technologically mediated, technoscientifically defined, and electronically targeted social life observed at great speed from a great distance, as if from the windows, viewfinders, and targeting scopes of air forces watching the ground.

The One State

In his great anti-utopian novel *We* (written 1920, translated into English 1924), Yevgeny Zamyatin named the oppressive, hyper-rationalized, totalitarian government blocking his protagonist's happiness "the One State." Sf had inherited the conception of a unitary world state from utopian fiction, but it came into its own as a plausible, ideal, able to be created in reality, with the technologies of mass-production and communications, Taylorized labor and pervasive surveillance. The utopian model took its emphatically technocentric turn in Edward Bellamy's *Looking Backward: 2000–1887* (1888) and Wells's *The World Set Free*, works of incomparable influence on Western imagination, but in Zamyatin's One State the irony of a utopia based on

material control systems is foregrounded. Playing on the pun embedded in it, *We*'s One State embodies an ideal fusion of political and physical entropy.

Technology offered the airplane, the rocket, the radio, the superweapon, rationalized cities, and grand projects conquering brute nature as practical tools for extending the power of the state. Through the technological rationalization of labor of the Fordist and Taylorist regimes, the coalescence of the productive mechanism of the state and continual expansion into space could be guaranteed. Twentieth-century audiences were most familiar with the anti-utopian critiques of totalitarianism envisioned in *We*, Aldous Huxley's *Brave New World* (1932), and George Orwell's *Nineteen Eighty-Four* (1949). But the One State was not only a myth of administrative monopoly. It represented an immanent momentum toward greater and greater intersections of political and economic institutions, and, in the second half of the century, the interlock of myriad communication and control systems required for the administration of institutions. A particularly sharp opposition is found in the conflict between Zamyatin and the Soviet Proletkult, an avant-garde movement that shared with constructivism the idealization of mechanism and a proletarian–Taylorist hive-mind (see Lewis and Weber 1988). For political sf, the One State represents not just the technological state (with its space programs and high-tech militarization), but a "social state," a technological condition of being, in which all aspects of life are mediated by intermeshing systems of technological rationalization.

Such a universalization of technical infrastructures is not necessarily a matter of state administration. It might just as easily derive from capitalist corporations, as in Frederik Pohl and C.M. Kornbluth's *The Space Merchants* (1953), or from the reconsolidation of diffuse cybernetic technologies into general control systems imagined in cyberpunk fiction such as William Gibson's *Neuromancer* (1984). Sf has also modeled avenues of resistance: the freelancing co-opters of technology who put the punk in cyber-bio-nanopunk, hacker anarchists, ecological saboteurs, surfers on the inevitable dissipative wave. Yet the One State remains as the stipulation of imperial technological rationalization, the condition that must be addressed before freedom from it can be imagined.

The cyborg

Much has been written in recent years about the cyborg. Beginning with the real-world fighter pilot wired with sensors, electronically enhanced to operate his machinery faster than his own conscious decision-making will allow, to the machine-grafted human being kept alive or upgraded by cybernetic devices, to Donna Haraway's network beings who break down the ontological walls among machine, animal, human being, and information, the cyborg has evolved into a dominant science-fictional trope for technological empire (see Gray 1995). As Haraway's work and its great influence demonstrate, the cyborg is not limited to a particular bionic icon; it is rather a way of imagining relationships among domains in the technosocial world as interdependent and fluid. With the penetration of technoscience into the smallest regions of the body, the body of nature has become subject to transmutative manipulations. Sf has long operated in this world.

The earliest models of scientific rationalization pervading intimate social life were the robot and the lab-constructed monster. These figures first appeared in the Jewish Kabalistic tradition or in alchemical science, and were gradually naturalized by nineteenth-century German philosophy of nature (a tradition associated predominantly with Schelling) and Gothic sf, in works such as E.T.A. Hoffman's "The Sandman" (1816), Mary Shelley's *Frankenstein* (1818), August Villiers de L'Isle Adam's *Future Eve* (1886), and Wells's *The Island of Doctor Moreau* (1896). Such figures were brought fully into the politics of sf and empire by Karel Čapek's vision in *RUR* (1920) of the industrially produced slave robot labor. All these creatures of scientific myth embodied the intrusion of emerging technoscience into the most intimate matters of personal identity and origins. By placing among naturally evolved human beings humanoid beings made possible only through technoscientific creation, the imaginary empire could break down the notion of natural (i.e., extra-technological, extra-rational) identity, and pursue endocolonization, that is, the extension of the colonizing power networks into the imperial center at its base: human social consciousness.

The cyborg is the techno-imperial subject. Its condition of being is its fluidity, tactically reconstituting itself in innumerable configurations and constellations with other, similarly variable beings. The conditions for these quick adaptations are set by the network of technological possibilities of changing material existence itself. Although the name of the cybernetic organism implies a form of second-natural regulation equal to the natural (the difference between a cyborg on the one hand, and a mechanical or purely evolutionary prodigy on the other), it is impossible to be a cyborg outside the technological–informational matrix. Real scientific advances in digital analysis, transgenics, pharmacology, and micro-surgery have inspired a new conception that physical bodies are infinitely pliable local formations, no longer bound by oppressive general principles of natural generation. This is an imperial model, analogous to the goals of political empires to create new subjects no longer bound by their local traditions, nor forced to assimilate with the dominant power, but rather "free" to align with the imperial center and seek its mediation in managing local conflicts, all in the name of universal peace and wealth. The alternative is exclusion from community and overwhelmingly efficient violence.

In the techno-imperial sphere, resistance as well as dominance are possible only in the cyborg state, and much of contemporary oppositional politics occurs as contests over the technological control-system. The science-fictional image of the rebellious hacker codified in cyberpunk has profoundly influenced anti-establishment hacker saboteurs in the real world. Even deeply reactionary movements, like the Iranian Islamic revolution or Al Qaida, depend on elaborate electronic communications webs to gain and manage their power. And environmentalist resistance, in sf and reality alike, must negotiate with the need to face a world not only degraded by ecological plunder, but emptied of wilderness. In works such as George R. Stewart's *Earth Abides* (1949) and Ursula K. Le Guin's *Always Coming Home* (1985), only cataclysmic natural catastrophes, or, alternatively, as in Octavia Butler's *Dawn* (1987), only alien

"gene-trading" technologists, can offer hope of restoring pre-imperial difference and wildness.

Escape velocity

In the first years of the twentieth century, Tsiolkovsky, the founder of Russian rocket science, profoundly influenced by Nikolai Fyodorov's early transhumanism and Verne's space-travel sf, proposed a program of rocket-assisted flight "by which human beings could escape the tyranny of earth's gravity and limited resources and eventually become the perfected, immortal beings" they were destined to become (Lykin *et al.* 1995: 370). The rocket's escape velocity was to be the literal human condition. Much of the history of technological innovation in the twentieth century can be viewed as a metaphorical extension of this dream of accelerating the transformations of every human faculty until it breaks from its biological, mortal, terrestrial weight, and radiates freely and powerfully through the universe. That universe may be the physical one that is opened up through enhanced spaceflight, begun with the space programs of the Soviet Union and the US, and continued through interplanetary travel, and even interstellar flight made possible by cryogenics, longevity chemistry, modular cyborg bodies, faster-than-light travel, warp drives – technologies still imaginary, but intimately familiar to a hypermodern culture pervaded by sf tropes. The superseding universe may also be a virtual one of synthetic consciousness preserved or enhanced digitally, in more durable casings than the organic body, or infinitely pliable, distributed through space and time.

Many commentators on the hypermodern condition have noted this general acceleration of experience. For Virilio, it signifies the annihilation of space – and consequently all ties that bind human beings to earth – by sheer speed (see Virilio 1986 and 2000; see also Armitage and Graham 2001). Mark Dery has dubbed the ephemeralization of work, experience, and desire effected by perpetually accelerating digital technologies, the cherished theme of cyberpunk and posthumanist sf, as a drive to achieve escape velocity from history (Dery 1996: 3). Technological imperialism means leaving behind the local spacetimes of nation, gender, species, nature, mortality, and perhaps eventually body, animal, gene, life, and matter, as well. The velocity of experience in real social life has few mediating fictive images and themes from the past to draw on. (Notably, none of the classical categories of the sublime involved speed.) They come rather, properly, from sf's future.

Alan Shapiro has identified three science-fictional categories of escape-technologies in *Star Trek*, perhaps the most influential work of sf at the end of the century. There are the technologies of literal escape, such as the Holodeck, for people to escape from their own physical reality; the Transporter, to escape from their locations; warp-drive and managed wormholes, to escape from their physical spacetime; time-portals, to escape from their own ages; the Universal Translator, to escape from their local languages; and so on. These technologies of literal displacement figure the actual technologies of virtuality at the turn of the twenty-first century, which "clearly entail the 'leaving behind' of corporeal existence to enter an alternate reality, such as an android body or an online VR-environment" (Shapiro 2004: 20). Second, there are technologies through which human subjectivity escapes "into organ-substituting imaging apparatuses of television, cinema, VR and realtime communications" (Shapiro 2004: 20). Such prosthetic systems transform the sense of reality from one of fixed laws to a game of models, whose rules can be altered at will. In these technologies, the experienced world disappears into simulation. Finally, there is technologies' own self-liberation, through which they and their subjects are freed from their hyperrational determinations – the only resistance remaining against the empire.

The technological empire does not exist as a visible political entity. But it is not a phantom of conspiracy theorists. On the contrary, it is so pervasive a force of social gravitation that it feels like nature. Its power is negotiated by the traditional means of bourgeois mediation: journalism, education, advertising and propaganda, the entertainment industry, and by the daily transformations of everyday experience that occur when populations are compelled to depend on constantly and rapidly "upgraded" machines and communication networks simply to survive. Sf must be counted as the primary institution of art that makes this new regime habitable by the imagination.

Bibliography

Adas, M. (1989) *Machines as the Measure of Men: science, technology, and ideologies of Western dominance*, Ithaca, NY: University of Cornell Press.

Arendt, H. (1951) *The Origins of Totalitarianism*, New York: Meridian Books.

Armitage, J. and Graham, P. (2001) "Dromoeconomics: towards a political economy of speed," *Parallax*, 17(1): 111–23.

Bernal, J.D. (1969) *The World, the Flesh, and the Devil: an enquiry into the future of the three enemies of the rational soul*, 1929, 2nd edn, Bloomington: Indiana University Press.

Dery, M. (1996) *Escape Velocity: cyberculture at the end of the century*, New York: Grove.

Fischer, P.S. (1991) *Fantasy Politics: visions of the future in the Weimar Republic*, Madison: University of Wisconsin Press.

Franklin, H.B. (1988) *War Stars: the superweapon and the American imagination*, New York: Oxford University Press.

Fritzsche, P. (1992) *A Nation of Fliers: German aviation and the popular imagination*, Cambridge, MA: Harvard University Press.

Gray, C.H. (1995) "Science Fiction Becomes Military Fact," in C.H. Gray (ed.) *The Cyborg Handbook*, New York: Routledge.

Hagemseister, M. (1997) "Russian Cosmism in the 1920s and Today," in B.G. Ronsenthal (ed.) *The Occult in Russian and Soviet Culture*, New York: University of Cornell Press.

Haraway, D.J. (1991) "A Cyborg Manifesto: science technology, and socialist-feminism in the late twentieth century," in *Simians, Cyborgs, and Women: the reinvention of nature*, New York and London: Routledge.

Hardt, M. and Negri, A. (2000) *Empire*, Cambridge, MA: Harvard University Press.

Headrick, D.R. (1981) *The Tools of Empire: technology and European imperialism in the nineteenth century*, New York: Oxford University Press.

Henderson, W.O. (1951) "Walther Rathenau: a pioneer of the planned economy," *The Economic History Review*, New Series 4(1): 98–108.

Hughes, T.P. (1994) "Technological Momentum," in M.R. Smith and L. Marx (eds) *Does Technology Drive History? The dilemma of technological determinism*, Cambridge, MA: MIT Press.

Lewis, K. and Weber, H. (1988) "Zamyatin's *We*, the Proletarian Poets and Bogdanov's *Red Star*," in G. Kern (ed.) *Zamyatin's We: a collection of essays*, Ann Arbor, MI: Ardis.

Lykin, V. *et al.* (1995) "Tsiolkovsky, Russian Cosmism and Extraterrestrial Intelligence," *Quarterly Journal of the Royal Astronomical Society*, 36: 369–76.
Omissi, D.E. (1990) *Air Power and Colonial Control: the Royal Air Force, 1919–1939*, Manchester: Manchester University Press.
Palmer, S.W. (2006) *Dictatorship of the Air: aviation culture and the fate of modern Russia*, Cambridge: Cambridge University Press.
Pape, R.A. (2004) "The True Worth of Air Power," *Foreign Affairs*, 83(2): 116–30.
Press, D.G. (2001) "The Myth of Air Power in the Persian Gulf War and the Future of Warfare," *International Security*, 26(2): 5–44.
Scott, J.C. (1998) *Seeing Like a State: how certain schemes to improve the human condition have failed*, New Haven, CT: Yale University Press.
Shapiro, A.N. (2004) *Star Trek: technologies of disappearance*, Berlin: Avinus Verlag.
Sherry, M.S. (1989) *The Rise of American Air Power: the creation of Armageddon*, New Haven, CT: Yale University Press.
Virilio, P. (1986) *Speed and Politics: an essay on dromology*, 1977, trans. M. Polizzotti, New York: Semiotext(e).
—— (1995) *The Art of the Motor*, 1993, trans. J. Rose, Minneapolis: University of Minnesota Press.
—— (2000) *The Information Bomb*, 1998, trans. C. Turner, London: Verso.
Winter, F.W. (1983) *Prelude to the Space Age: the rocket societies: 1924–1940*, Washington, DC: Air and Space Museum/Smithsonian Institution.

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ENVIRONMENTALISM

Patrick D. Murphy

What does the form of literary analysis based on environmental values, known as ecocriticism in the US and green studies in the UK, have to offer readers of sf? In turn, what does sf have to offer ecocriticism? A significant vein in the earliest sf, paralleling natural history, consisted of terrestrial voyages of discovery. Two ubiquitous questions appeared in both: what is nature? what is a human being? Sf's ethical dimension has long included a particular elaboration and method for addressing both questions: environmentalism, which in the public domain combines ethical theory and political activism.

Depending on definitions, one could consider novels by Mary Shelley, William Dean Howells, Jules Verne, and Charlotte Perkins Gilman, and short stories by Nathaniel Hawthorne and H.G. Wells as demonstrating at least a proto-environmentalist awareness, with several of these works overtly and obviously encouraging readers not only to think but also to act differently. It would be a mistake, however, to claim that because a significant portion of sf has an environmentalist orientation, the genre is intrinsically pro-nature. Different examples, such as Walter Miller Jr's *A Canticle for Leibowitz* (1959), Greg Bear's *Blood Music* (1985), Ian McDonald's *Chaga* (1995), and Michael Crichton's *State of Fear* (2004), could lead to the conclusion that sf is anti-environmentalist. While certain authors are self-consciously environmentalist in their literary politics, such as Ursula Le Guin, Kim Stanley Robinson, and Karen Traviss, I am not so interested in intent as in effect. Fictions can leave environmental or anti-environmental impressions in readers' minds often more as a result of the cultural and historical circumstances of their reception than as a result of their conditions or intentions of production.

Before proceeding, distinctions, which should be understood as relational differences rather than as antagonistic oppositions, must be drawn between *nature*, *environment*, and *ecology* (see Coupe 2000; Plumwood 2002). For heuristic purposes, let us define *nature* as the non-artificial or non-manufactured, material reality that provides the setting for a work of sf. It should not be perceived as external to the characters, since their *natural* physical makeup constitutes part of the non-artificial reality of the story. This recognition becomes particularly important in novels containing aliens. Not infrequently, these representations of the Other-as-alien both reflect back on the representations of the Self-as-alien and defamiliarize earthly animals as potentially