

Cyborg

SETH GIDDINGS

University of Southampton, UK

“Cyborg,” a compound noun derived from “cybernetic organism,” refers to a human, or sometimes an animal, whose body is augmented by technological parts or organs. Although cyborgs are generally thought of as creatures of science fiction, actual developments in medical technology and prostheses over the late 20th and early 21st centuries have been hailed as creating “cyborgs.” Hence, in science-fiction film and literature, cyborgs are most commonly depicted as technologically enhanced humans, but actual everyday examples would include the heart patient with a pacemaker. The term has been particularly influential in communication and cultural studies debates on science, technology, and the body through the work of Donna Haraway.

The idea of the cyborg originates in scientific speculation on a possible future of space travel. In 1960 the neurophysiologist Manfred Clynes, responding to concerns about the mental and physical effects of long periods of time in space, proposed a technological modification and augmentation of the human body and brain. The problems Clynes hoped to mitigate were both physiological and psychological. Could the human body be adapted so as to process oxygen without using the lungs, and could artificial control of body temperature remove the need for a pressure suit in the vacuum of space? Could the need for sleep be suspended (during activities that required constant attention) or induced (for “hibernation” on long flights)? On the other hand, what psychological problems might arise from the monotonous environment of a spacecraft—or, conversely, how could the brain process the large flows of information required for other activities in space? Clynes’s proposed solutions included adapting existing technologies, notably implanted homeostatic pumps for delivering drugs, as well as creating speculative technologies such as fuel cell implants.

As Clynes’s term suggests, the thinking behind the cyborg was strongly influenced by cybernetics, and in particular by Norbert Wiener’s work on control systems during and immediately after World War II. Cybernetics describes self-regulating systems of information feedback and communication in machines and animals, including humans. As a “cybernetic organism,” then, the cyborg functions through systems of information, communication, and feedback between its biological and technological parts. Though a cardiac patient fitted with a pacemaker may not appreciate the term, he or she would be unambiguously cyborgian in Clynes’s terms: a being whose ongoing survival is predicated on the human person’s fixed bodily coupling with mechanical and informational technology. Other actual medical cyborgian augmentations would include cochlear implants, as well as current experiments with nerve-controlled prostheses. Although strictly speaking the augmentations of a *cybernetic* organism

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would, like the pacemaker, establish an informational feedback loop, it is reasonable to regard the history of human sensory and motor augmentation as of one kind—from walking sticks and artificial limbs to spectacles and hearing aids.

Though Clynes's cyborg was a highly specialized idea and the specific augmentations he proposed have largely not been realized, since the 1960s these scientific speculations have resonated with popular culture, which has come up with fictional characters and monsters that similarly blur the boundaries between the human and the technological, the biological and artificial. Science-fiction film, TV, and literature have spawned a diverse array of cyborg characters—*Six Million Dollar Man*, *The Bionic Woman*, the Borg of *Star Trek* on television, *Robocop*, *The Terminator*, and the replicants of *Blade Runner* at the cinema—while cyberpunk video-game series such as *Syndicate* and *Deus Ex* are similarly populated with cyborgs. *Treasure Planet*, Disney's animated science-fiction reworking of Robert Louis Stevenson's *Treasure Island*, reimagined Long John Silver as a cyborg with mechanical and robotic prostheses instead of a wooden leg. Japanese popular culture has also demonstrated a persistent interest in cyborgian and robotic figurations, from *Astro Boy* in the 1950s to the cyberpunk manga and anime series *Ghost in the Shell*, *Battle Angel Alita*, and *Full Metal Alchemist*. Though the cyborgs have their own distinct biological-technical nature, they cannot be separated from longer histories of fictional augmentations and animations of dead matter, from the robots and artificial intelligences of 1950s science-fiction film and literature—back to Mary Shelley's *Frankenstein*, and perhaps even to the automatons of classical Greek myth. The cyborg then is a vivid, shifting figuration of contemporaneous popular fears and hopes about life in a technological environment.

The cyborg's currency within communication and cultural theory is inseparable from the work of the American academic Donna Haraway and her influential essay "A Manifesto for Cyborgs," first published in 1985 (Haraway, 1990). Through this provocative essay, the cyborg has become a significant figure in research and debate on feminist theories of technology and embodiment in particular, and on theories of technology and culture more widely. Haraway's vision of the cyborg deliberately encompasses and mixes fictional and actual aspects. Her cyborg is an "ironic political myth," a vivid and monstrous image that personifies, at once, an emerging technoculture characterized by increasingly intimate relationships between the body and machines, a new set of political challenges raised by the technologies of information and control, and a radical intervention in feminist theory and politics.

One of Haraway's immediate concerns was to question the tendency, in the feminism of the 1970s and 1980s, to romanticize nature and thereby to associate women with the natural and align them against the "masculine" domains of science and technology. The cyborg, for Haraway, epitomized the breaking down of these politically counterproductive binary oppositions. The cyborg would be both natural and cultural, biological and technological, inhabiting a not entirely ironic utopian future in which such oppositions would be undermined:

self/other, mind/body, culture/nature, male/female, civilized/primitive, reality/appearance, whole/part, agent/resource, maker/made, active/passive, right/wrong, truth/illusion ... [as dualisms] systemic to the domination of women, people of color, nature, workers, animals. (Haraway, 1990, p. 218)

Hence the manifesto's ambitions were to mount a "challenge to western either/or epistemology," that is, to address the post-Enlightenment separation of the human (and human reason, human society) from the nonhuman (tools, systems, animals, nature) as well.

The cyborg also articulates the new systems of military power and warfare: C³I—control, command, communications, and intelligence. Again, Haraway sees subversive potential in these networks of power, "feminist cyborg stories have the task of recoding communication and intelligence to subvert command and control" (Haraway, 1990, p. 206).

Thus the cyborg is deliberately ambiguous, encompassing as it does fictional characters such as Robocop, the increasing material intimacy between human bodies and machines (in medicine, warfare, or in miniaturized consumer electronics), a conception of networks as complex systems in which the categories of biology and machines blur, and a utopian, "postgender" subject position. Haraway takes *Blade Runner's* heroine, the replicant Rachel, as an example. As a genetically engineered android, Rachel is biological rather than mechanical or electronic, but she has been manufactured or synthesized rather than generated through sexual reproduction, gestation, and birth (Haraway, 1990, p. 219). The horror of this "replication" can also suggest the "utopian tradition of imagining a world without gender" (Haraway, 1990, p. 192).

There has been some debate over the definition of the cyborg itself. N. Katherine Hayles for instance sets out two distinct types of real-world cyborg (i.e., in addition to the cyborgs of fiction and cinema), differentiating between "actual cyborgs" (e.g., the cardiac patient–pacemaker hybrid) and "metaphoric cyborgs." These latter are intense cybernetic relationships between human bodies, machines, and information—but relationships that are not permanently connected. Video-game players in an arcade exemplify this "metaphoric" cyborg: an intense cybernetic circuit of human and machine, but one that is temporary and is easily disaggregated (Hayles, 1999, p. 115). Others have noted this distinction but argue that even—or perhaps especially—these temporary or iterative techno-corporeal couplings are emblematic of late 20th-century cyberculture. Contemporary life in the developed world is a near-constant set of overlapping and nested relationships between the human mind and body and nonhuman processes and entities. For instance, Deborah Lupton has described the everyday phenomenon of the motorcar and its driver as a literal, not as a metaphorical cyborgian synthesis. While not hard-wired like Robocop, the driver–car is a hybrid creature with quite different behaviors and capabilities from those of its separate parts. Indeed, a significant criticism of the figure of the cyborg would be that it is generally figured as, and understood to be, an individual, anthropomorphic body. However monstrous, it remains reassuringly *human* in shape, scale, and agency. Lupton notes that any particular car driver is just one component of a near-global technological system of traffic control, surveillance, government policy, the economics of consumption and fuel prices, urban development, and so on:

the network of social relations, norms and expectations around car use, such as road rules, and material and spatial aspects such as the physical nature of roads, the presence of traffic lights and of other cars, represent ever-present structuring features of car use. Cyborg subjectivities, therefore,

are not simply about how we, as bodies/selves, interact with our machines, but about how we interact with other cyborgs as part of a cyborg “body politic.” (Lupton, 1999, p. 59)

These everyday cyborgs are assemblages: impermanent but significant couplings of the human and the nonhuman, of human and machinic components within a technologized environment. We might also compare automotive systems with the intangible systems of the flows of information, finance, and capital through global computer networks. Rather than an augmented human we see vast cyborgian systems, nonhuman in form, with human minds and bodies as atomized subsystems that circulate through and service them. Given the now well-established presence of software agents or “bots” within all kinds of computer networks and the current promise of driverless cars, not even the notion of the integral, fundamental agency of human bodies and minds within these systems can any longer be taken for granted.

In the thirty years since it first appeared in “A Manifesto for Cyborgs,” Haraway’s cyborg has shaped debates on technology, culture, and embodiment, not least through the discourses of cyberfeminism it largely inspired. In the mid-1990s, a decade or so after its first publication, academic attention to the Internet and World Wide Web found the cyborg a productive figure for thinking about these new communication spaces, bracketed as “cyberspace,” and for the experiences and subjectivities they were seen to engender. Beyond the monstrous visions of science fiction, it directs attention to the increasingly technologized and mediatized nature of everyday life and to the intense and intimate relationships of control through which people are constituted by digital media, surveillance, transport systems, education and health systems, and military planning and action.

Twenty-first century technological developments appear to be continuing the trajectory toward everyday cyborgian augmentation, including through advances in controllable prostheses, new neural interfaces, and the production of cheaper, lighter materials, for example through 3D printing. Genetic engineering and nanotechnology are further undermining any of the reassuring boundaries between the natural and the technological that may still subsist.

SEE ALSO: Augmented Reality; Biotechnology; Cultural Studies; Feminism; Posthumanism; Science, Technology, and Society Studies; Virtual Reality; Wiener, Norbert

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Seth Giddings is associate professor of digital culture and design at the Winchester School of Art, University of Southampton, UK. His research interests cover media, technology, and culture, with a particular interest in popular and experimental playful media technologies. He is the author of *Gameworlds: Virtual Media and Children’s Everyday Play* (2014), editor of *The New Media and Technocultures Reader* (2011), and coauthor, with Lister and others, of *New Media: A Critical Introduction* (2009).