

## Cyborgs

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926 words

The term “cyborg” was coined in 1960 by Manfred Clynes and Nathan Kline, as a portmanteau of Norbert Wiener’s (1965) “cybernetics” with “organism.” A cybernetic organism (cyborg) is a biological creature—generally a human being—whose functioning has been enhanced through integration of mechanical, electrical, computational, or otherwise artificial, components.

Many concepts now associated with the term cyborg predate the term’s usage: antecedent or similar terms include robot, android, replicant, bionic human; stories of human-machine hybrids date back to myths such as Daedalus’ artificial wings. Presentations of human-machine hybrids have frequently acted as tropes in social arguments and literary imaginations that attempt to conceive the proper roles and deeper meaning of humans themselves, of machines, of the moral worth of each, and of the interactions among them.

Following the popularization of the term cyborg, especially in science fiction of the 1960s and 1970s, a number of further neologisms with the cyber- prefix have developed that refer chiefly back to cyborgs, rather than directly to cybernetics. These include cyberpunk (fiction), cyberfeminism (theory), cyberspace (electronic networks), cybersex (shared fantasy). Indeed, ad hoc usage of the prefix is common in journalism and popular writing.

### **Technology and Forms of Cyborgs**

Organic capabilities enhanced in cyborgs vary in kind, as well as in extent. The enhancements addressed in fiction or essays—or, indeed, by practiced technologies—follow both the rhetorical or literary purposes of their creator and the evolving state of societal technical capabilities. Early examples of cyborgs generally centered around mechanical enhancements to motion; the growing prevalence of electronic sensors and computers led to discussion of cyborgs that improve human perception, cognition, and communications channels. With inventions in genomics and nanotechnology at the start of the 21st century, visions of cyborgs often discuss augmentation of human health and longevity.

Diverse thinkers set very different boundaries for what artificial additions make a human into a cyborg. In a broad sense, all humans in the last several thousand years have been intimately shaped by the utilization and presence of technologies around them, or physically manipulated or attached to them. A spear, or even a stick, extends human capabilities for hunting or warfare; writing extends human memory, cognition, and information transmission. Inclusive thinkers, including those embracing the label transhumanism, focus on this broadest sense, usually with the intention of extending human-machine interactivity.

In a stricter conception of the cybernetics stem, a cyborg’s machine elements must have a meaningful feedback mechanism with its biological aspects. For example, a continuity exists between a wooden-leg that, indeed, enhances motility, to a hinged,

weighted and carefully balanced artificial leg, to a servomechanical prosthetic that actively responds to posture and muscle conductivity.

### **Cultural Imagery of Cyborgs**

A prominent trend in the literary portrayal of cyborgs has been distinctly dystopian, seeing cyborgs as extensions or symbols of socially destructive industrial or post-industrial technologies. An early and prominent entry in this genre was Shelley's (1831) *Frankenstein*. Many subsequent works updated a similar anxiety over the violation of the moral dignity and integrity of human beings, from Fritz Lang's *Metropolis* to melodramatic portrayals of cyborgs as powerful evil beings in popular films such as the *Terminator*, *Star Wars*, *Star Trek*, or *Matrix* series. With the increasing feasibility of genetic or other biological manipulation of humans, many criticisms of such genetic cyborgs arise from ethical—and often religious—perspectives, which largely recapitulate the set of concerns suggested by Shelley. Many of these are in turn represented in dystopian fiction portraying the emergence of a new eugenics.

In contrast to negative portrayals, several literary or intellectual trends praising or advocating cyborgs have occurred over a similar time frame. Cyborgs have acted as super-heros, from Jean de la Hire's *Nyctalope* at the beginning of the 20th century, through numerous mid-century American comic book heros, on to late-20th century television heros such *The Six Million Dollar Man* and *The Bionic Woman*, or the *Robocop* film series.

Beyond the cartoonish heros or villains of some popular fiction, a number of intellectuals—who have generally conceived cyborgs in their expansive sense—have seen liberating potentials in cyborgs. For some, such as Haldane (1923) or Weiner (1965), cyborgs simply represent an extension of the positive capabilities of technologies; most practicing doctors and medical researchers probably share this attitude, albeit infrequently naming medically assisted humans as cyborgs. Another trend in social thought, however, puts a positive light on cyborgs because of their possibility of breaking down normative roles of gender, class, race, or other subaltern status (perhaps as much by compelling metaphor as by direct intervention). This tradition largely follows Michel Foucault's conception of *biopower*; Haraway (1991) is a prominent thinker in this tradition.

Recent fiction around cyborgs, particularly that labeled cyberpunk, both takes a morally ambivalent attitude towards what it conceives as more-or-less inevitable cyborg technologies, and also tends to focus on cognitive and communicative enhancements over physical ones.

SEE ALSO: Cognition; Cognitive Science; Cyberfeminism; Cybernetics; Domestication of Technology; Human-Computer Interaction; Marshall McLuhan; Social Construction of Technology

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Biography: David Mertz is a freelance writer who has written for academic journals including *Social Epistemology*, *Bioethics*, *Rethinking Marxism*, *Radical Philosophy Review*; for technology publications including *IBM developerWorks*; and has written the Addison Wesley programming book *Text Processing in Python*.

Keywords: Transhumanism, Android, Cyberpunk, Dystopian