

INTRODUCTION

 Marquard Smith and
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With every tool man is perfecting his own organs, whether motor or sensory, or is removing the limits to their functioning. . . . Man has, as it were, become a kind of prosthetic God. When he puts on all his auxiliary organs, he is truly magnificent; but these organs have not grown on to him, and they still give him trouble at times. . . . Future ages will bring with them new and probably unimaginable great advances in this field of civilization and will increase man's likeness to God still more. But in the interests of our investigations, we will not forget that present-day man does not feel happy in his Godlike character.

—Sigmund Freud, *Civilization and Its Discontents*¹

The prosthesis is not a mere extension of the human body; it is the constitution of this body qua "human."

—Bernard Steigler, *Technics and Time*²

The rich diversity of specially commissioned essays in *The Prosthetic Impulse: From a Posthuman Present to a Biocultural Future* engage, in one way or another, with the figure of "prosthesis." Originally from the Greek, the word *prosthesis* entered the English language in around 1553 and was initially used, as David Wills informs us in his landmark book *Prosthesis*, in its grammatical sense, as "the addition of a syllable to the beginning of a word."³ It wasn't until 1704, Wills goes on to say, that

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a medical sense of *prosthesis* was employed to mean a “replacement of a missing part of the body with an artificial one.”⁴ Already from these earliest instances in the discourses of grammar and of medicine, *prosthesis* offers itself up as an “addition” or a “replacement,” and it is usually this dual meaning that persists to this day. It underpins considerations of prosthesis in the medical profession, in the spheres of mechanical engineering and design innovation, in the visual arts, and across the academic humanities and beyond. Pointing to an addition, a replacement, and also an extension, an augmentation, and an enhancement, prosthesis has become a staple in the armory of metaphors or tropes that are utilized by intellectuals, scholars, students, and practitioners who are concerned with interactions *in general* between the body and technology in modernity as they figure a conception of prosthetic lives in our posthuman times.

And yet . . .

To a perhaps worrying extent, “the prosthetic” has taken on a life of its own. Following closely on the heels of the appeal of the cyborg in the late 1980s and 1990s—which was prompted in large part by the success of Donna Haraway’s 1985 essay “The Cyborg Manifesto: Science, Technology, and Socialist Feminism in the 1980’s,” as well as by developments in the cultural studies of science and technology, science fiction cinema and literature, transplant technology, artificial intelligence, virtual reality, postmodern warfare, and so on—“the prosthetic” has similarly begun to assume an epic status that is out of proportion with its abilities to fulfill our ambitions for it.⁵ Often it is conjured up as an instance of “metaphorical opportunism,” a phrase used by David T. Mitchell and Sharon L. Snyder in the introduction to their edited collection *The Body and Physical Difference: Discourses of Disability* to characterize the ways in which thinkers like Jean Baudrillard and Paul Virilio but also N. Katherine Hayles, Avital Ronell, and Haraway herself “deploy disabled bodies as proof of our fascination with ‘cyborglike’ prosthetic enhancement.”⁶ But this portrayal is by no means restricted to just the prosthetically enhanced “disabled body.” In fact, so dominant has the trope of prosthesis become that Sarah S. Jain has dubbed our obsession with its capabilities “the prosthetic imagination.”⁷ For Jain, this is no more or less than a marker of our cultural condition’s desire to disavow the fact of prosthesis and instead indulge in flights of fantasy to utilize prosthesis as “a tempting theoretical gadget with which to examine the porous places of bodies and tools.”⁸

In part, then, we hope that *The Prosthetic Impulse* adds credence to these voices of caution and to similar recent correctives by others who are working on prosthesis from within anthropology and material–culture studies (such as Steven L. Kurzman and Katherine Ott) by further interrogating the metaphorical opportunism of “the prosthetic imagination” and, in so doing, reassert the phenomenological, material, and embodied nature of “the prosthetic impulse.”⁹ At the same time, we are wary of dismissing out of hand the metaphorical potential of the aforementioned flights of fancy of prosthesis since they set in motion imaginative speculations, analyses, and interpretations. Because the authors gathered here are alert to both the phenomenological and speculative aspects of prosthesis, in attending to the complex historical and conceptual confluence of modernity, technology, and “the human,” the texts in this collection negotiate and critically interrogate both the material *and* the metaphorical possibilities of prosthesis.

The Prosthetic Impulse is by necessity concerned with how the material and metaphorical figurations of prosthesis initiate considerations of the historical and conceptual edges between “the human” and the posthuman, the organic and the machinic, the evolutionary and the postevolutionary, and flesh and its accompanying technologies. (Certainly we are not simply tracking a transformation or metamorphosis from one to the other.) Concentrating on how these edges figure prosthesis in its historical and conceptual materiality *and* in its metaphoricity is to begin to acknowledge how (since at least the classical era and certainly explicitly theorized with the advent of modernity) “the human” has been understood as technologized, thereby revealing to us the *promise* of the “posthuman” that is already found in the human and the humanization of technology itself. “The prosthetic impulse” specifies *this delicate dialectical situation in which we find ourselves* and with which this volume deals. The essays herein thus work toward a dialectical materialism and a dialectical *immaterialism* where identity, embodiment, consciousness, perception, and memory have been and are lived out inelegantly in an age of science, technology, and information.

What is “the prosthetic impulse” of which we speak?

To begin, there are two possible answers to this question. One is more conventional, the other less so. The more conventional answer is that the discourse of the humanities and elsewhere has proposed—sometimes explicitly, sometimes implicitly—that our modern Western culture has a “prosthetic impulse.”¹⁰ In recent years, some fascinating writings have sought to define as well as reply to this prosthetic condition with political and ethical debates that cut across history, philosophy, the history and philosophy of science, critical theory, the medical humanities, literature, new media, material culture, and the visual arts, as well as the grey areas between them. At their best, these writings have attended to, debated, and struggled with the points at which modernity has brought the modern subject and technology (in its broadest sense) into contact with one another and to what ends.¹¹

In general, these productive writings have both responded to and shaped our knowledge and curiosity about “the prosthetic impulse.” In the context of this literature, this impulse is composed of any encounter—material, figural, or metaphorical—that facilitates or contests our chances of making (human) contact with a modern world that is ever more mediated and determined by communication technologies, biomedicine, and information. Such encounters, in this expansive literature, do not simply examine the ways in which the body is extended or enhanced by prosthetic technologies but also explore the ways that the body and technology come into contact with one another and are integrated, fused, reciprocal, and parasitic. This understanding of prosthesis might include discussions of contact with old or new communication technologies—from the telegraph, the automated typing machine, and the telephone to the mouse, the computer screen, and video conferencing; from air conditioning to virtual environments; from practices of dissection to laparoscopic surgery and unmanned space travel; from ghosts in the machine to the sentience of “living” technology; from cyborgian organisms to the *Visible Human Project*;¹² from biomedicine and nanotechnology to the postorganic; from robotics and genetics to hacker culture; from electronic lighting to telematic networks; from teledildonics to military hardware; from closed-circuit television and digital censoring to policing one’s own practices and pleasures; from pacemakers to artificial wombs; from glasses, telescopes, microscopes, and the camera obscura to more recent ocular prosthesis such as virtual-reality gaming and other immersive technologies; from reports of the

world's first face transplant to the news that Microsoft has been awarded U.S. Patent 6,754,472, which bears the title "Method and apparatus for transmitting power and data using the human body" and which will grant the company exclusive rights to the body's ability to act as a computer network.¹³

Of course, one could also say that "the prosthetic impulse" is enacted, dare one say created, in the spheres of culture, literature, the visual arts, and our everyday practices where there are no shortages of instances of such prosthetic contact. In the history of science fiction and horror cinema, for example, *Frankenstein* and *Metropolis* gave way to *Blade Runner* and *The Terminator*, which in turn have led to *Tetsuo: The Iron Man*, *Pi*, *Crash*, *Gattaca*, *A.I.: Artificial Intelligence*, and *I, Robot*. Philip K. Dick, William Gibson, and Japanese comic book artists continue to define cyberesthetics. In visual art practice, the mutable and obsolete flesh of Orlan and Stelarc is eulogized, and attention is lavished on new media arts and the sonic arts. Similarly, the histories of reconstructive, esthetic, and cosmetic surgery are being chronicled. The popularization of modern primitivist adornment and technopaganism offers a now almost banal notoriety to the body arts of tattooing, piercing, and scarification. Specialist dating agencies, publications, and e-magazines—such as *Amp Life*, *Real Crip Sex*, and *Amputee.online.com*—are plentiful. And the catwalk has had its first couture (from the Latin *consuere*, "to stitch together") model, double amputee Aimee Mullins, who modeled for Alexander McQueen's 1999 London spring collection and appears in the most recent installation of American artist Matthew Barney's *Cremaster* film cycle (1994–2002).

Such are the ways in which academics and creative practitioners have initiated, grasped, and commented on "the prosthetic impulse" in our contemporary cultural condition. We know this is familiar, there is nothing too surprising about the ubiquity of such body-technology contact. This is, after all, the more conventional answer to our question, "What is 'the prosthetic impulse'?"

The less conventional answer to the question of "What is 'the prosthetic impulse'?" is given throughout this collection. *The Prosthetic Impulse* is not first and foremost concerned with our hopes that encounters with technology—and the knowledge and practices that emanate from such contact—will lead us to self-extension into

a technoculture. If anything, quite the opposite. This volume is not over-invested in perpetuating the exhilaration of an earlier moment in the cultural considerations of prosthesis, a moment best exemplified in Jean Baudrillard's frenzied warning of technology's infectiousness:

*The point when prostheses are introduced at a deeper level, when they are so completely internalized that they infiltrate the anonymous and the micro molecular core of the body, when they impose themselves upon the body itself as the body's "original" model, burning out all subsequent symbolic circuits in such a way that every body is now nothing but an invariant reproduction of the prosthesis: this point means the end of the body, the end of its history, the end of its vicissitudes. It means that the individual is now nothing but a cancerous metastasis of his basic formula.*¹⁴

The overexcited fear that is induced by such a theorization of encounters with cybernetic prostheses, by the indulgent and dystopian panic of contagion, and by the rhetoric of high postmodernism is a position from which the authors in this volume take a step back. They are not concerned with such fatality, such inevitable futurity. We have learned that the body, its histories, and its mutability have not become fixed by technology. There is no fear of technology's invasion and infiltration of the body, as outlined by Baudrillard. These scholars in *The Prosthetic Impulse* are not simply interested in the ways in which human beings are *enhanced* by the augmentation of human intelligence and capabilities by prosthetic technologies. Nor are they simply contributing to the unremitting escalation of the pile of scholarly literature that is introducing us, yet again, to cyberculture, to technoculture, to our virtual futures. Although the texts are informed by these general concerns that arise around the confluence of the human, of technology, and of cultural transformation, the contributors to this volume are specifically fascinated by *where the edges lie*, as Allucquère Rosanne Stone has asked, *between* the person and communication prostheses.¹⁵ Where does one stop and the other begin?

Accordingly, the texts herein attend to the ways that prostheses, both material and metaphorical, have the potential to form an integral part of certain speculations on the corporeal surface, the psyche, and the interior and exterior limits of the body and to the ways that these efforts to renegotiate discourses on "the human" might attend to the edges between these material and immaterial

surfaces and limits. They do so by negotiating the dialectical process wherein these very limits and edges—emerging as they do from particular histories, bodies, objects, and practices—enact or voice such a challenge. Yet these writings also do more than this. Against a more evolutionary understanding of the gradual infiltration of the body by prosthesis, there is a common consensus among the authors gathered here that the point of prosthetic contact—and the dialectic of the edges in such contact—is also a part of a process that recognizes exactly how “the prosthetic” is an integral or “interconstitutive” part of the “human.” This is the more particular, less conventional answer to the question “What is the prosthetic impulse?” and is the crux of this volume.

This puts us on our way toward showing how Sigmund Freud’s and Bernard Steigler’s words at the beginning of this chapter and our response to them identify ways in which “the prosthetic impulse” reveals that the promise of “posthuman” thought can already be found in the human. Here we take our lead on the posthuman from one of its clearest, recent articulations in N. Catherine Hayles’s *How We Became Posthuman*, in which she writes: “The posthuman subject is an amalgam, a collection of heterogenous components, a material-informational entity whose boundaries undergo continuous construction and reconstruction.”¹⁶ In Hayles’s consideration, she declares that “the posthuman view thinks of the body as the original prosthesis we all learn to manipulate, so that extending or replacing the body with other prostheses becomes a continuation of a process that began before we were born.”¹⁷ This is consistent with Steigler’s assertion in *Technics and Time*, the second epigraph to this chapter: “The prosthesis is not a mere extension of the human body; it is the constitution of this body *qua* ‘human.’”

The essays in *The Prosthetic Impulse* take an eclectic approach to this understanding of prosthesis, born as it is from the particularity of specific histories, bodies, objects, and practices. They draw on historical and theoretical methodologies from gender studies and philosophy, literary criticism and visual culture, psychoanalysis and deconstruction, critical race studies, cybertheory, and phenomenology. Through these means, they attend to the dialectic and edges between metaphor and materiality, figuration and literality, inside and outside, internalization and

externalization: quite simply, they work in between the points of contact linking bodies and technologies to configure them differently.

Part 1, “Carnality: Between Phenomenology and the Biocultural,” is grounded in a dialectic between prosthetic embodiment—as phenomenological, psychic, and material—and the historical, cultural, scientific, neurological, biomedical, and figural discourses that constitute this embodiment as such. In particular, by playing out the fraught dialectic between the material and metaphorical implications of prosthesis, the essays in this part interrogate bodies, sexual lure, eroticism, genetics, neural networks, mimesis, and the esthetic to stretch the limits and limitations of current debates on that ultimate prosthetic God, “the post-human.” Concentrating on the organic body, a body that is determined not by evolution so much as by way of a nonteleological phenomenology, these essays outline a rendering of the body, the human form as flesh, whose very materiality constitutes it as always and already prosthetic.

Vivian Sobchack’s essay “A Leg to Stand On: Prosthetics, Metaphor, and Materiality” begins this interrogation in earnest by drawing our attention to the recent technofetishistic or technoanimistic embrace of the prosthetic as a particularly sated metaphor in critical discourses on technoculture and the posthuman. In offering a critical response to this “metaphorical displacement of the prosthetic,” Sobchack forces our attention toward the metaphorical *and* the material mechanisms of both language and the embodied phenomenological experience of lived bodies that by necessity underpin any figuration of the prosthetic. Picking up on the question of technofetishism, Marquard Smith’s “The Vulnerable Articulate: James Gillingham, Aimee Mullins, and Matthew Barney” asks about the kinds of erotic fantasies that are being played out across medical, commercial, and later avant-garde images of the body of the female amputee in our Western visual culture. In so doing, he suggests that as opportunistic as such fantasy is, because this “perversity” is itself structured by prostheses it has something to tell us, quite unexpectedly, about the intimacy and vulnerability of body-machine unions. In pursuing the notion of sexual perversity from another angle, Alphonso Lingis’s “The Physiology of Art” outlines a (nonteleological) evolution of artistic compulsion, a compulsion that is found in humans, other mammals, and in fauna, and drives them to adorn and display themselves as a manifestation of their desire to create their body as art. In seeking to reveal how this compulsion dis-

closes how beauty and infirmity are themselves prosthetic from the beginning, he focuses on the erotic potential of apotemnophilia, a fixation on self-amputation.

Also confronting the question of “evolution” head on, in “Stumped by Genes: *Lingua Gataca*, DNA, and Prosthesis” Lennard J. Davis contributes to the emerging discourse of “biocultures” by exploring how a reconceptualization of genetics—in which the gene itself “acts as a kind of prosthetic *en abime*, an endlessly deferred location” or as “a virtual prosthetic”—demands an attention to the fixing and unfixing of race. Gary Genosko’s “The Bug’s Body: A Disappearing Act” also plugs into the biocultural by way of the history of insects in military research and science fiction to consider how the bug as a “machinic principle of interactivity” haunts cyberculture. He goes on to suggest how it has come to do so via the (assimilationist) technique of biomimesis—a combination of machine and insect body that challenges the distinction between an organism and its environment.

In “On the Subject of Neural and Sensory Prostheses,” Lisa Cartwright and Brian Goldfarb draw out and mobilize the confluence of the prosthetic, the neural, and the networked to propose an “interconstitutive” bond. By focusing on foregrounding “neural prosthesis,” they play out how the interweaving of the fictional, the technical, and the autobiographical can enact a profound conceptual shift, conceiving of “the intersubjective unit body and technology as an intrasubjective entity.”

Finally, in exploring the intersections between disability and queerness in military culture, David Serlin’s “Disability, Masculinity, and the Prosthetics of War, 1945 to 2005” explores how the “dynamic potential of queer practices” and “expressions of queerness” within this nationalistic culture offers a homoerotic continuum rather than a heterosexist demarcation between nonnormative bodies, ablebodiness, and masculinity.

Part II, “Assembling: Internalization. Externalization,” considers the technological qualities and peculiarities of prosthesis. This part uses prosthesis as a way of interrogating the notion that an isomorphic relationship exists between the subject’s internal world and its external projection. This is ultimately a question of mimesis and its technologies. By recognizing the work that prostheses undertake, both literally and metaphorically, part 2 brings together, unpacks, and reassembles this question. First, this section posits the mimetic relationship as dialectical: the internal and external form a reciprocal, mediated, and inflected

relationship with one another. Second, the relationship is constituted by gaps and fissures. Together these approaches enable the essays in this part to consider the linguistic, ontological, visual, and epistemological issues posed by prostheses within the framework of social and technological production, raising questions around the ways in which film, photography, artificial intelligence, drawing, and literature—representation itself—can be situated within the framework of a prosthetic discourse.

Beginning this part, Elizabeth Grosz's essay "Naked" concerns itself with the *mediated* nature of our nakedness as visual representation. She asks how the body is augmented through its representation, the extent to which such mediation is determined by the primacy of vision, and the consequent overattention to sexual spectacle and sexual viewing. In so doing, she goes on to rethink notions of the gaze, voyeurism, and exhibitionism to propose a new typology of looking. Lev Manovich's "Visual Technologies as Cognitive Prostheses: A Short History of the Externalization of the Mind" tracks how over the last century and a half visual technologies—from photography and film to contemporary experiments in computer-image systems, cognitive psychology, and neuroscience—invent or fabricate models through which it becomes possible to "externalize the functions of consciousness." The far-reaching implications of this trajectory, proposes Manovich, are that this very desire to objectify the psyche—to imagine or visualize the mind itself—gave birth to modern imaging technologies such as photography, cinema, and virtual reality. Raiford Guins and Omayra Zaragoza Cruz are also intent on excavating this process of externalization, albeit very differently, and to this end in "Prosthetists at 33 $\frac{1}{3}$ " they engage with sound technologies and black urban culture. They show how Marshall McLuhan's pronouncement on the phonograph as "an extension and amplification of the voice" was misjudged from the beginning and instead turn to practices of "turntablism"—a prosthetic media technology environment that places a recognition of racialization at the center of debates in acoustic culture.

Similarly caught up in questions of externalization, this time in relation to the externalization of memory, in "Technology or the Discourse of Speed" David Wills turns to the writings of French philosopher Bernard Stiegler. In picking away at this monumental body of work and its blindspots, Wills charts the uncanny effects of technology, the "prosthetizing effect" in which the human is defined as

technological in a way that will have profound implications for our understanding of time and speed, language, the image, and the politics of new media. Finally, concerned with the ways in which the prosthetic has been theorized in relation to writing, specifically as a means of understanding the corporeal and psychic construction of subjectivity, Joanne Morra's "Drawing Machine: Working through the Materiality of Rauschenberg's Dante and Derrida's Freud" tracks the role of the graphic within the philosopher's thoughts on the analyst's writing machines. Unlike Derrida's interest in the a priori of writing, Morra examines the ways in which a work of art and its production—specifically, Robert Rauschenberg's transfer *Drawings for Dante's Inferno*—can reveal the elision that substantiates this priority and thereby can recuperate the visual, drawn element of the graphic.

In the end, then, *The Prosthetic Impulse* explores how the figure of "prosthesis"—born as it is from the discourse of grammar and medicine as an "addition" and a "replacement"—has always been more complex and nuanced than it is presented in "the prosthetic imagination" as an extension or augmentation or enhancement of the human in investigations of the posthuman. For "prosthesis" is material as well as metaphorical, literal as well as figural, and (as we have begun to suggest) is these things together from the beginning. As such "the prosthetic impulse" needs to be considered in these diverse and convergent ways because ultimately this is *the delicate dialectical situation in which we find ourselves*.

Freud did have a sense of this, as is intimated in this chapter's opening epigraph from *Civilization and Its Discontents*. His words certainly suggest a possible future in which the magnificence of humans as prosthetic gods is tempered by the ill-fitting and troublesome nature of their auxiliary organs. To anticipate the future through the figure of the human and its enhancement is for Freud to imagine something glorious, inadequate, and imperfect. But Freud gets us only so far. *The Prosthetic Impulse* is interested in something altogether more minor and all the more marvelous because of it—the prospect that the body and prosthesis are already of one another in specific ways that are lived out and experienced through material as well as metaphorical considerations that are embodied in and theorized directly out of particular histories, bodies, objects, and practices.

This volume, then, sits awkwardly between Freud's conception of a future possibility and Stiegler's conception of a future anterior. This is what *The Prosthetic Impulse: From a Posthuman Present to a Biocultural Future* attempts to do. It is just a matter of pondering where the inelegant edges lie—and living them most wonderfully.

Notes

1. Sigmund Freud, *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, Vol. 21, *Civilization and Its Discontents*, trans. James Strachey (London: Hogarth Press, 1953–1974), 101.

2. Bernard Stiegler, *Technics and Time*, Vol. 1, *The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins (Stanford: Stanford University Press, 1998), 152–153.

3. David Wills, *Prosthesis* (Stanford: University of Stanford Press, 1995), 218.

4. *Ibid.*

5. It is worth remembering that Haraway's "Manifesto" was avowedly ironic, which many enthusiasts of the cyborg seem to have forgotten or ignored. See Donna Haraway, "A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980's," *Socialist Review* 80 (1985): 65–108.

6. David T. Mitchell and Sharon L. Snyder, eds., *The Body and Physical Difference: Discourses of Disability* (Ann Arbor: University of Michigan Press, 1997), 8. Mitchell and Snyder rightly make it clear in their text that Hayles, Ronell, and Haraway do much besides this.

7. Sarah S. Jain, "The Prosthetic Imagination: Enabling and Disabling the Prosthesis Trope," *Science, Technology, and Human Values* 24, no. 1 (1999): 31–54.

8. *Ibid.*, 49.

9. Steven L. Kurzman, "An Anthology of the Prosthesis Field" (1996), "Cultural Attitudes toward Prostheses: An Anthropological Approach" (1997), "Performing Able-Bodiedness: Amputees and Prosthesis in the USA" (1996), all retrieved from <<http://www2.ucsd.edu/people/kurzman/index.htm/>>; Steven L. Kurzman, "Presence and Prosthesis: A Response to Nelson and Wright," *Cultural Anthropology* 16, no. 3 (2001): 374–387; Katherine Ott, David Serlin, and Stephen Mihm, eds., *Artificial Parts, Practical Lives: Modern Histories of Prosthesis* (New York: New York University Press, 2002). Peter Lunenfeld has similarly referred to "science-fictionalized" discourse as "vapor theory of ruminations unsupported by material underpinnings:"

see Lunenfeld, “Theorizing in Real Time: Hyperaesthetics for the Techno-culture,” *Afterimage* 23, no. 4 (1996): 16–18.

10. This collection is concerned with prosthesis in modern Western cultures. We are aware of the limits of this focus. Much has been written on prosthesis in non-Western cultures from within anthropology and material-culture studies. References to these writings—in particular Kurzman, Nelson, and Srinivasan—can be found in the following note.

11. While there are scores of books and articles on Modernity and technology, by no means all of them refer to or invoke the matter of prosthesis in particular. For the more interesting ones that do, along with others that do not necessarily mention prosthesis directly, see, for example, Tim Armstrong, *Modernism, Technology and the Body: A Cultural Study* (Cambridge: Cambridge University Press, 1998); Gabriel Brahm, Jr. and Mark Driscoll, eds., *Prosthetic Territories: Politics and Hypertechnologies* (Boulder, CO: Westview Press, 1995); Lisa Cartwright, *Screening the Body: Tracing Medicine's Visual Culture* (London: University of Minnesota Press, 1995); Howard Caygill, “Stelarc and the Chimera: Kant's Critique of Prosthetic Judgment,” *Art Journal* (Spring 1997), 46–51; Mark Dery, ed., “Flame Wars: The Discourse of Cyberspace,” *South Atlantic Quarterly* 92, no. 4 (1993); Helen Deutsch and Felicity Nussbaum, eds., *Defects: Engineering the Modern Body* (Ann Arbor: University of Michigan Press, 2000); Sander L. Gilman, *Making the Body Beautiful: A Cultural History of Aesthetic Surgery* (Princeton: Princeton University Press, 2000); Elizabeth Haiken, *Venus Envy: A History of Cosmetic Surgery* (Baltimore: Johns Hopkins University Press, 1997); Haraway, “A Manifesto for Cyborgs”; N. Katherine Hayles, *How We Became Posthuman* (Chicago: University of Chicago Press, 1999); Jain, “The Prosthetic Imagination”; Kurzman, “Presence and Prosthesis”; Alison Landsberg, “Prosthetic Memory: *Total Recall* and *Blade Runner*,” *Body and Society* 1, nos. 3–4 (1995): 175–189; Drew Leder, *The Absent Body* (Chicago: University of Chicago Press, 1990); Akira Mizuta Lippit, *Electronic Animal* (Minneapolis: University of Minnesota Press, 2000); Peter Lunenfeld, ed., *The Digital Dialectic* (Cambridge: MIT Press, 1999); Celia Lury, *Prosthetic Culture* (London: Routledge, 1998); Lev Manovich, *The Language of New Media* (Cambridge: MIT Press, 2001); Mitchell and Snyder, *The Body and Physical Difference*; David T. Mitchell and Sharon L. Snyder, *Narrative Prosthesis: Disability and the Dependence of Discourse* (Ann Arbor: University of Michigan Press, 2000); Diane M. Nelson, “Desire and the Prosthetics of Supervision: A Case of Maquiladora Flexibility,” *Cultural Anthropology* 16, no. 3 (2001): 354–373; Diane M. Nelson, “Phantom Limbs and Invisible Hands: Bodies, Prosthetics, and Late Capitalist Identifications,” *Cultural Anthropology* 16, no. 3 (2001): 303–313; Diane M. Nelson, “Stumped Identities: Body Image, Bodies Politic, and the *Mujer Maya* as Prosthetic,” *Cultural Anthropology* 16, no. 3 (2001): 314–353; Ott, Serlin, and Mihm, *Artificial Parts, Practical Lives*; Sadie Plant,

Zeros + Ones (London: Fourth Estate, 1998); R. L. Rutsky, *High Techne* (Minneapolis: University of Minnesota Press, 1999); Jeffrey Sconce, *Haunted Media* (Durham, NC: Duke University Press, 2000); Mark Seltzer, *Bodies and Machines* (London: Routledge, 1992); Richard A. Sherman, *Phantom Pain* (New York: Plenum Press, 1996); Vivian Sobchack, "Beating the Meat/Surviving the Text, or How to Get out of This Century Alive," in Mike Featherstone and Roger Burrows, eds., *Cyberspace/Cyberbodies/Cyberpunk: Cultures of Technological Embodiment* (London: Sage, 1995), 205-214; Vivian Sobchack, "Is Any Body Home? Embodied Imagination and Visible Evictions," in Hamid Naficy, ed., *Home, Exile, Homeland: Film, Media, and the Politics of Place* (New York: Routledge, 1999), 45-61; Raman Srinivasan, "Technology Sits Cross-legged: Developing the Jaipur Foot Prosthesis," in Ott, Serlin, and Mihm, *Artificial Parts, Practical Lives*, 327-347; Stiegler, *Technics and Time; Technema: Journal of Philosophy, and Technology*; Rosemarie Garland Thomson, *Extraordinary Bodies: Figuring Physical Disability in American Culture and Literature* (New York: Columbia University Press, 1997); Mark Wigley, "Prosthetic Theory: The Disciplining of Architecture," *Assemblage* 15 (1991): 7-29; David Wills, "Preambles: Disability as Prosthesis," in Laurence Simmons and Heather Worth, eds., *Derrida Downunder* (Palmerston North, NZ: Dunmore Press, 2001), 35-52; Wills, *Prosthesis*; David Wills, "Re: Mourning," *Tekhnema: Journal of Philosophy and Technology* 4 (1998): 8-25; Robert Rawdon Wilson, "Cyber(body)parts: Prosthetic Consciousness," *Body and Society* 1, nos. 3-4 (1995): 242; Gaby Wood, *Living Dolls* (London: Faber and Faber, 2002).

12. Lisa Cartwright, Constance Penley, and Paula A. Treichler, *The Visible Woman: Imaging Technologies, Science, and Gender* (New York: New York University Press, 1998). See also Lisa Cartwright, "The Visible Man: The Male Criminal Subject as Biomedical Norm," in Jennifer Terry and Melodie Calvert, eds., *Processed Lives: Gender and Technology in Everyday Life* (London: Routledge, 1997), 124-137.

13. David Adam, "Computerising the Body: Microsoft Wins Patent to Exploit Network Potential of Skin," *The Guardian*, July 6, 2004, 3; David Concar, "The Boldest Cut," *New Scientist*, May 29, 2004, 32-37.

14. Jean Baudrillard, *The Transparency of Evil*, trans. James Benedict (London: Verso, 1993), 119.

15. Allucquère Rosanne Stone, *The War of Desire and Technology at the Close of the Mechanical Age* (Cambridge: MIT Press, 1995), 5.

16. Hayles, *How We Became Posthuman*, 3.

17. Hayles, *How We Became Posthuman*, 3.