A close-up, slightly angled photograph of a petri dish containing a bacterial culture. The agar surface is covered with various patterns of bacterial growth, including streaks and clusters of different colors (red, pink, and white). The petri dish is made of clear plastic, and the background is a neutral, light-colored surface.

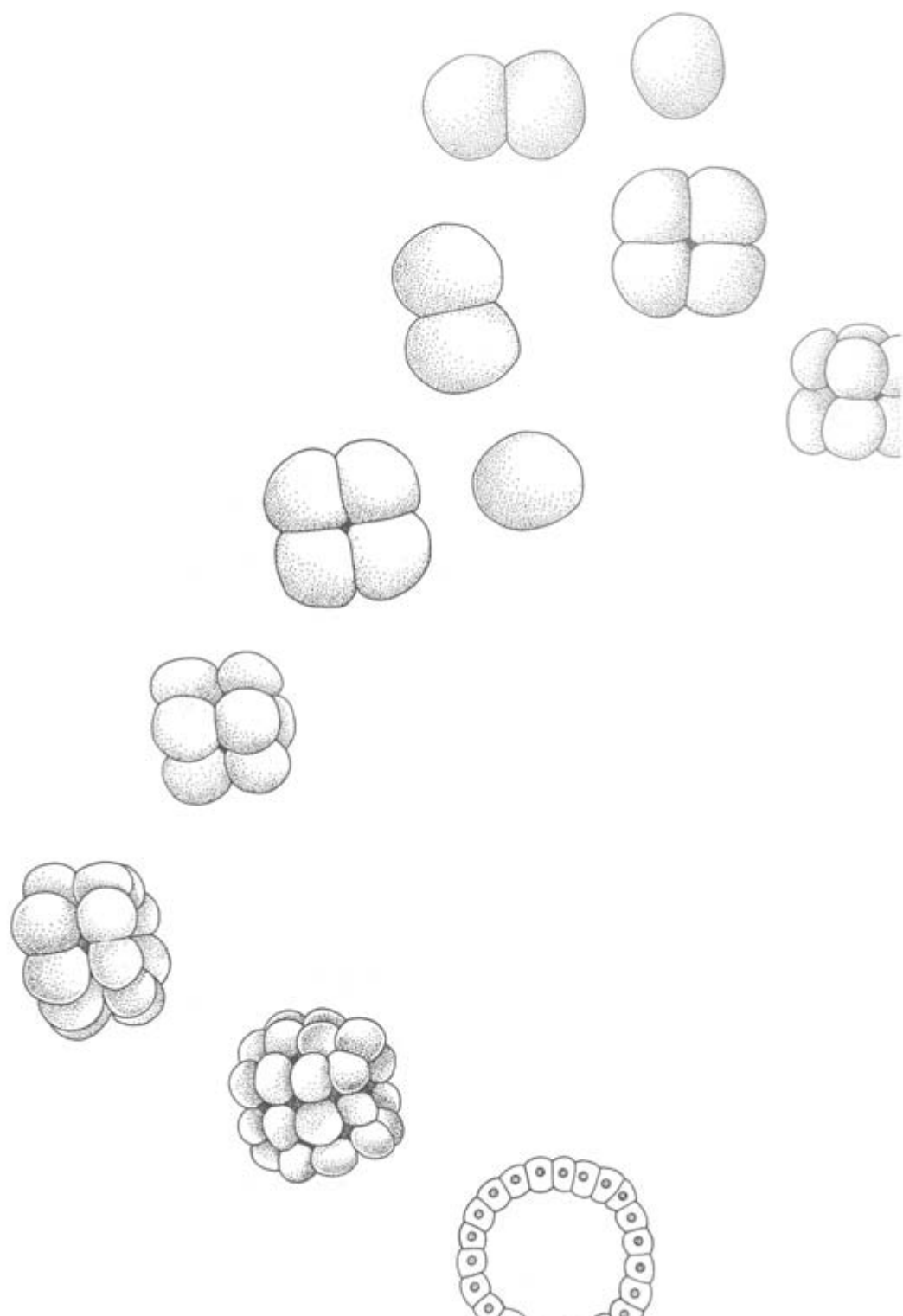
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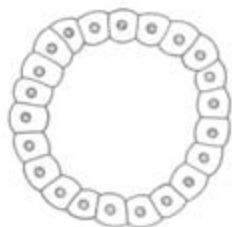
IMAGINING THE HUMAN AT

THE FRONTIERS OF BIOMEDICINE

Susan Merrill Squier

LIMINAL LIVES





Liminal Lives

IMAGINING THE HUMAN AT
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Susan Merrill Squier

Duke University Press Durham & London

2004

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Printed in the United States of America on acid-free paper ∞

Designed by C. H. Westmoreland

Typeset in Cycles with Helvetica Neue display

by Keystone Typesetting, Inc.

Republication acknowledgments appear
at the bottom of page 334.

Library of Congress Cataloging-in-Publication Data

Squier, Susan Merrill.

*Liminal lives : imagining the human at the frontiers of
biomedicine / Susan Merrill Squier.*

p. cm.

Includes bibliographical references and index.

ISBN 0-8223-3381-3 (cloth : alk. paper)

ISBN 0-8223-3366-X (pbk. : alk. paper)

1. Social medicine. 2. Medical ethics. 3. Medical technology.
 4. Human reproductive technology. 5. Science fiction. I. Title.
- [DNLM: 1. Bioethics. 2. Ethics, Medical. 3. Feminism.
4. Medicine in Literature. 5. Reproductive Techniques—ethics.

WB 60 S7731. 2004]

RA418.S76 2004

174.2'9—dc22 2004014307

I dedicate this book

with love to my parents,

CONSTANCE CHESTER SQUIER

AND JOHN DAVID SQUIER

(August 16, 1925–August 4, 2004)

All things are impermanent.

That which is born will also die; that which has met will also part;
what has been taken will be lost; what has been made will break.

Time flies past like an arrow. All is evanescent.

Is there, in this world, anything not transient?

—Eihei-ji

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Acknowledgments

This book has taken me some time to write, and along the way I have benefited from the support, kindness, and stimulating interchange with so many people and institutions that I am sure I will forget some of them, and I beg their forgiveness. Penn State University has been a great community in which to live and to work on this book. The Rare Book Room of Pattee Library has superb holdings in science fiction, thanks to its legendary curator the late Charlie Mann, and I want to thank Sandy Stelts for her continuing responsiveness to my peculiar requests and interests. The SMTC (Science, Medicine, Technology, and Culture) group has been a long-term pleasure, and I thank Rich Doyle, and Robert Proctor and Londa Schiebinger (now at Stanford, alas). Nancy Tuana has created a great community in the Rock Ethics Institute at Penn State, with its disability studies reading group, feminist science studies reading group, and (most recently) the Agnatology Conference. Particular thanks to Nancy Tuana, Michael Bérubé, Janet Lyon, and Alexa Schriempf; and to Wenda Bauchspies, Malia Fullerton, Mark Morrison, Marianne Sommer, and Jodie Nicotra. Thanks, too, to Carolyn Sachs and the Penn State Women's Studies Program for its broad and capacious understanding of what can constitute feminist research; to the English Department at Penn State, for support of my science studies interests; and to Vincent Lankewish, Alice Sheppard, Jane Juffer, Mark Morrison, Paul Youngquist, Evan Watkins (whom we miss), Don Bialostosky, and Robert Caserio. A conversation with Stanley Weintraub when I was newly arrived at Penn State nudged my

interest in the other half of the story that I began telling with *Babies in Bottles*, and I want to thank Stanley for the conversation, which alerted me to C. P. Snow's *New Lives for Old*. Thanks to the RGSO and the College of the Liberal Arts for supporting the SMTc and this project.

The Society for Literature and Science has been a core community for me since 1994, and once again I want to thank the society for the great context for interdisciplinary science studies work, and wonderful conferences. Many early versions of chapters in this book were first presented at SLS meetings, both in the United States and in Europe. Thanks to Richard Nash, Eve Keller, Hugh Crawford, Anke Ryall, Anne Balsamo, Vicki Kirby, Nina Lykke, Bruno Clarke, Linda Henderson, Stephanie Smith, Kate Hayles, Phoebe Sengers, Laura Otis, Bernice Hausman, and Jim Bono. Special thanks to Elizabeth Wilson and Cathy Waldby for sharing their work and being great long-distance interlocutors and friends. Over the years, many of these chapters have taken shape in conversation with Kathleen Woodward and the interdisciplinary communities she has created, first at the Center for Twentieth Century Studies and more recently at the Simpson Center at the University of Washington. Thanks to members of that extended community: Paul Brodwin, Stephen Katz, Alice Wexler, Anne Davis Basting, the late Glenda Laws, Philip Thurtle, Rob Mitchell, and above all Kathy and Herb. Particular thanks to Dick Blau for his photographs, and Anne Davis Basting for sharing with me the manuscript of her play *TimeSlips*. Thanks also to Kathryn Montgomery and the Medical Humanities Program at Northwestern University Medical School, where I have given a number of chapters in progress, and also to Suzanne Poirier, Tod Chambers, Ann Starr, and the late Suzanne Fleischman, members of the seminar "Case History, Narrative, and the Construction of Objectivity."

For other opportunities to present work in progress, I also want to thank Sigrid Weigel and the Einstein Forum, in Potsdam, Germany; Franziska Gygax and the Department of English and the program in Social Medicine at the University of Basel; Manuela Rossini, and participants in the Gender Talks forum in Geneva, Switzerland (especially Cathy Waldby and Anne Fausto-Sterling); Domna Pastourmatzi, Darko Suvin, and participants in the Biomedical Themes in Science Fiction conference in Thessaloniki (which I regret being unable to attend because of the attacks of 9/11); the Center for Women's Studies at the University of Oslo, Norway, and participants Nina Lykke and Pat Spal-

lone; Anke Ryall and the Women's Studies Program at the University of Tromsø, Norway; Tim Murphy and the Institute for the Humanities at the University of Illinois at Chicago; Sandy Sufian and the Medical Student Interest Group in History and Medical Humanities at the University of Illinois at Chicago Medical School; Kristi Kirschner and the Rehabilitation Institute of Chicago and Northwestern University Medical School; Kelly Ormond and the Graduate Program in Genetic Counseling at Northwestern University; Julie Uihlein and the organizers of the Paul S. Pierson Memorial Lecture on Bioethics at the Medical College of Wisconsin; Charles Garoian and Yvonne Gaudelius and the Conference on Performance Art, Technology, and the Body at Penn State University; E. Ann Kaplan, Ira Livingston, Dusa McDuff, Adrienne Munich, and the Humanities Institute at Stony Brook; Helen Longino and the organizers of the Women, Gender, and Science Conference at the University of Minnesota (and to Charis Cussins for her discussions about interspecies pregnancy); Karen Fingerman and the Gerontology Society of America; the Center for Critical Analysis of Contemporary Culture (where the opportunity to be a respondent to Kathy Woodward's work on aging was a great catalyst for my thinking); and the American Society for Bioethics and the Humanities, especially Tod Chambers, Anne Hawkins, Kathryn Montgomery, and Suzanne Poirier.

I thank Anne Hawkins, and the participants in our NEH Institute on Medicine, Literature, and Culture, for the stimulating interchanges of that intense month together, and I especially thank Susan Erikson for her responses to chapter 6, and visitors Anne Davis Basting, Terri Kap-salis, and Lisa Cartwright. I want to acknowledge the support of the Rockefeller Foundation for a research residency at the Bellagio Study and Conference Center, and in particular I thank Ann Curthoys, John Docker, Evelyn Keller, Amos Lapidoth, John Boone, and Miguel Altieri for their companionship there. Once again, I thank Lesley Hall and the Wellcome Institute for the History of Medicine (now the Wellcome Library) for being a great resource and an ideal archive in which to work, and I also thank the Library of the Philadelphia College of Physicians and Surgeons. For smart questions and good conversations, thanks to Gretchen Helfrich and other participants in the radio programs on *Odyssey* at <http://www.chicagopublicradio.org/odyssey/>. For bibliography help when I needed it, huge thanks to Virginia.

One of the greatest pleasures about teaching at Penn State has been working with my graduate students. I want to thank Holly Henry, Christina Jarvis, Julie Vedder, Harvey Quamen, Lisa Roney, Elizabeth Mazzolini, Megan Brown, Melissa Littlefield, and Jillian Smith for the joy of working with them and learning from them. Christina, Julie, Elizabeth, Megan, and Melissa also worked hard as my research assistants. I thank them much for their help at all stages of this book. I want to welcome my new graduate students, Marika Seigel and Shannon Walters, who have already influenced my thinking about reproduction and disability studies issues, and I thank the members of my graduate and undergraduate seminars on science studies; medicine, literature, and culture; feminist theory; and feminist perspectives on research and teaching across the disciplines.

Finally, I thank Six Rings Sangha, Dai-En Bennage and Mount Equity Zendo, Marie Secor, Syril Blechman, Jennifer Harp, Gwendolyn Thomas, and our kayaking community (especially Graham and Sandy, Elaine and Dennis, and OTT). Gowen Roper, Caitlin Squier-Roper, and Toby Squier-Roper continue to be my foundation and my delight. Virginia Squier, Lorin Nauman, Chambers Squier-Nauman, and Ian Squier-Nauman are my first phone call when I return to Centre County. Thanks, too, to Virginia for teaching me about children's literature. Reynolds Smith has been, once again, a great editor. While I happily acknowledge the help of these people and institutions—and others whom I have forgotten—the errors and failings remaining in this manuscript are my own.

Introduction

NETWORKING LIMINALITY

When claims about the epistemologically neutral
status of nature and its rigorous separation from society
are challenged by the existence of . . . ambiguous,
technologically created entities—neither alive nor dead,
both dead and alive—moralizing runs wild.

—Margaret Lock, *Twice Dead*

In March 2001, an adoption agency in California sued the United States federal government to prevent federal funding of research on embryonic stem cells. That agency, Nightlight Christian Adoptions, makes arrangements for infertile couples to “adopt” excess embryos left over from other couples’ fertility treatments. As an Internet news service reported:

[Nightlight Christian Adoptions] opposes National Institutes of Health plans to fund research using certain embryonic cells—arguing such research would cut the number of adoptable embryos and thus financially harm Nightlight and prospective parents.

At issue are stem cells, the building blocks for all human tissue. Scientists say research with them could lead to revolutionary therapies for diseases from Alzheimer’s to diabetes. They can be derived from aborted

2 Introduction

fetuses, fertility clinics' discarded embryos or adults. All types are under intense study, but embryonic stem cells generate the most scientific excitement because they appear the most flexible.

Privately funded scientists have culled stem cells from embryos donated by parents—a process that does destroy the embryo—and multiplied those cells in the laboratory. The NIH plans to fund embryonic stem cell research using only lab-grown cell lines—NIH scientists can't touch additional embryos.¹

Although its name invokes the familiar, reassuring past, when parents would leave the night light on for a worried child, this story about Nightlight Christian Adoptions informs subscribers to InfoBeat News Service of an unfamiliar, even frightening present. Over our morning coffee we can discover how the foundational categories of human life have become subject to sweeping renegotiation under the impact of contemporary biomedicine and biotechnology. This brief news story introduces us to some of the brave new beings—the *liminal lives*—populating this remarkable era. Perhaps the most prominent in this particular case is the “adoptable embryo,” whose new identity challenges the accepted time frame of a human life as well as the accepted notion of civil status available to human beings, extending it back into the prebirth, and even preimplantation, period. And also very new in our conceptual universe are embryonic stem cells, which, with their scientifically exciting flexibility, challenge our fundamental sense that human life is unidirectional, proceeding ineluctably from conception to death.

In this Internet report, we encounter some of the metaphors used (usually unselfconsciously) in the representation of these liminal lives: metaphors of human construction (“building blocks for all human tissue”); of sorting the valuable from the worthless and rejected (“scientists have culled stem cells from embryos”); of being protected from unwelcome physical attention, even assault (“NIH scientists can't touch additional embryos”); of state-regulated execution (“taxpayer-funded embryo destruction”). If we look closer, we discover that these metaphors reveal how the valued “adoptable embryos” are being defined against a range of human beings who are *not* protected: criminals (who are executed), people who are physically abused, and embryos that are *culled* as the spoilage of a harvest.² We can find in this report a record of the conflicting forces and institutions at play in Nightlight's law-

suit: methods of financial valuation; patterns of saving or discarding; private or public structures for research; debate around the notion of donating or purchasing living material; distinctions between lab-grown cell lines and parentally produced embryos.

What do the Nightlight adoptive embryos have to do with the marginal and devalued beings that shadow their metaphoric representation? And why do I begin here, when I am interested in the ways literature and science collaborate on, and contest, a new vision of human life? Let me give provisional definitions of these terms. By literature, I mean our representations of the world in stories and language-based arts. I use the term “literature” in its unrestricted sense, as writing of any kind, although its scope has increasingly been narrowed to mean a kind of writing associated with a certain class and sensibility, restricted to imaginative works, and viewed as an important “source of cultural and economic value” (Shumway 1994). I use the term “science” as shorthand for the more cumbersome “science and technology” or Bruno Latour’s term “technoscience”: “all the elements tied to the scientific contents no matter how dirty, unexpected or foreign they seem” (Latour 1987, 174). I am adapting for science studies Teresa de Lauretis’s modification of Foucault’s notion of *technologies*: techniques and discursive strategies that are put to the service of gender production and construction. I understand both literature and science as technologies because they incorporate “institutionalized discourses, epistemologies and critical practices” to define what is knowable and to bring those objects into being (de Lauretis 1987, 2–3; Foucault 1980). Whether they are the valued recipients of civil advocacy, or the rejected products of human or agricultural production, the new entities to which we are introduced by this brief Internet news report all share what the anthropologist Victor Turner has called the liminal position. Liminality—literally, “being on a threshold”—is Turner’s term for an in-between state, “betwixt-and-between the normal, day-to-day cultural and social states and processes of getting and spending, preserving law and order, and registering social status” (V. Turner 1977a, 33). We move into the realm of the liminal when we engage in cultural rituals that transcend everyday life, or to be more precise that *reframe* it in a heightened or universalized form. These rites of passage (a term coined by the folklorist Arnold Van Gennep) include weddings, births, christenings, gradua-

tions, farewell parties, wakes, and funerals. Such rituals and ceremonies help us come to grips with specific transitional moments in our lives. They generally have three stages: a separation from everyday life; a move into the margin, or *limen*, “when the subjects of ritual fall into a limbo between their past and present modes of daily existence”; and finally a return to everyday life, though at a higher level of status, consciousness, or social position (V. Turner, 1977a, 34). A space of “potency and potentiality,” “experiment and play,” the liminal zone escapes the fixity and regulation of clock time into a realm between what is and what may be (33–34).

The liminal lives that are the subject of this book exist in that in-between or marginal zone. Like the Nightlight “adoptable embryos,” neither discarded bioproduct nor valued human being, they are participants in a rite of passage, between everyday life and a higher or different level of existence. They define a transitional civil status as well, positing an extension of legal identity into the prebirth realm of pure human possibility. Like the embryos, the embryonic stem cells are also marginal (either temporally or taxonomically) to the human being. Whether harvested from the aborted fetus, the discarded embryo, or the adult, these stem cells are both like and not like a human being. Found in the embryo or fetus, they come from a time before human birth; when they are inserted in the brain of an elderly Alzheimer’s sufferer, we hope they will defer the decline to death. And though they partake of human qualities, they share with nonhuman life-forms the possibility of being harvested for a use that transcends their own life. These liminal lives test the boundaries of our vital taxonomies, whether social, ethical, biological, or economic. As medical interventions are reshaping our ways of conceiving, being born, growing, aging, and dying, liminal lives surround us—in our schools, our families, our professions, our institutions, our representations—anywhere that the expected shape or span of human life is being changed through biomedicine. If we think about the social response to in vitro fertilization, organ transplantation, and stem cell therapies, for example, we will realize that after some initial resistance (whether expressed by the press, politicians, theologians, or the law), these liminal beings are generally accepted by culture and society. As quickly as these beings are normalized, we lose awareness of them. Despite—or perhaps because of—their increasing importance to culturally dominant zones of repre-

sentation and practice (science, politics, economics), they escape categorization and detection, appearing only as elements of fantasy in culturally subordinate arenas of representation and practice (literature and visual or performance art). Yet I will argue that these new beings demand our attention, because they are powerful and dangerous representatives of a transformation we are all undergoing as we become initiates in a new biomedical personhood mingling existence and non-existence, organic and inorganic matter, life and death. They raise profound and complex ethical questions that the field of contemporary bioethics has yet to adequately address, largely because of its indifference to the epistemological power of fiction.

The disturbing undertones to the InfoBeat news story suggest that although the liminal zone can provide us with a source of creative play, possibility, and human agency, it can also generate personal, cultural, and institutional tension. As assisted reproduction, genomics, biotechnology, and other biomedical interventions become increasingly common (at least in the industrialized world), liminal lives have become symbolically privileged and troublingly unstable, even dangerous. Human beings have increasing difficulty maintaining discrete boundaries between states or realms, producing legal, psychological, social, and medical struggles explored by the popular press, government advisory groups, theologians, ethicists, and scholars. We struggle to differentiate the private fetus from the public, the “natural” fetus from the cultural, while the boundaries between fetus and gestating mother are increasingly subject to debate. The limits of a human life have been negotiated repeatedly as different definitions of death are generated. The distinction between human and animal, too, has come under pressure with the development of animal-human organ transplantation (xenotransplantation). As the impact of biotechnology grows, the variety of liminal figures to which we need to develop a response grows ever greater. Clearly we need a revision or extension of Turner’s predominately cultural definition of the term.

Although he often emphasized its links to the world of art and literature, as “a play of ideas, a play of words, a play of symbols, a play of metaphors,” Turner stipulated that liminality could extend to the realm of science and technology as well: “Scientific hypotheses and experiments and philosophical speculations are also forms of play, though their rules and controls are more rigorous and their relation to

mundane ‘indicative’ reality more pointed than those of genres which proliferate in fantasy. *One might say, without too much exaggeration, that liminal phenomena are at the level of culture what variability is at the level of nature*” (V. Turner 1977a, 33; italics mine). Turner’s distinction between liminality as a cultural experience and the natural process of variations addresses the cultural power of scientific hypothesis and philosophical speculation, but it fails fully to capture the imbrication of culture and biology characterizing our current condition. As Turner uses it, liminality is restricted to the cultural activities with which human beings shape and negotiate our life crises: “the movement of a man through his lifetime, from a fixed placental placement within his mother’s womb to his death and ultimate fixed point of his tombstone and final containment in his grave as a dead organism—punctuated by a number of critical moments of transition which all societies ritualize and publicly mark with suitable observances to impress the significance of the individual and the group on living members of the community. These are the important times of birth, puberty, marriage, and death” (V. Turner 1967, 94). Stressing the role of cultural rituals to mark the facts of human life, Turner relies on a foundational opposition between nature and culture. Implicitly, he assumes the intransigence of biology (both gestation and burial are “fixed” in their placement) in order to focus instead on the cultural construction of meaning: the way that neophytes in a ritual are, for example, “likened to or treated as embryos, newborn infants, or sucklings by symbolic means,” and the way they enact “a confusion of all the customary categories” (96–97). In the sense Turner uses the term, liminal beings are those taking part in cultural rituals that represent or construct them in certain ways, in order to cope with or control the movement over a certain fixed biological threshold. Thus, as Turner understands it, while the liminal is shifting, *life* is still stable. It is here, I argue, that contemporary biomedicine necessitates a significant revision of Turner’s thesis, one that acknowledges the shifting, interconnected, and emergent quality of human life.

Turner’s culturally based definition of liminality omits a crucial aspect of modern life, as is apparent if we consider it in relation to the Nightlight suit scenario.³ When a lawsuit is filed on behalf of would-be adoptive parents of embryos, who could not by any stretch of the imagination exist as adoptive beings without the apparatus of bio-

medicine required for cryopreservation, thawing, implantation, gestation, and birth, the boundary between the material and scientific, and the symbolic and cultural, has become impossible to define. The interpenetration of realms and processes once believed to be separate means that it is increasingly difficult to tell whether a variation is the result of nature or culture. No longer stable, the boundaries of our human existence have become imprecise at best, contested at worst.

Indeed, the definition of life has been subject to important rethinking recently under the impact of biotechnological advances like the ones producing the Nightlight lawsuit. As anthropologist Paul Rabinow has observed, the distinction between *zoë*, “the simple fact of being alive and applied to all living beings per se,” and *bios*, “the appropriate form given to a way of life of an individual or group,” is coming under increased scrutiny (Rabinow 1999, 15). At stake is the distinction between the individual human being and the collectivity of all life-forms; between the unmediated and the mediated existence; or between what used to be called *natural* life, and the life we shape with human institutions, from the arts to the sciences. For those of us who work as scholars and cultural critics, these biomedical changes have social and political consequences that must be addressed. “That the new genomic knowledges will form assemblages with social and political networks is clear,” Rabinow observes. But “precisely how changes in *bios* will interact with old and new forms of power relations is open to question, and the evolution must be observed and analyzed. *A pressing challenge is to find and/or invent means of doing so*” (15).

The first step in responding to that challenge, and finding ways of analyzing the new power relations produced by contemporary changes in the human bios, is to modify our working definition of the liminal. Turner’s definition of liminality, as that set of ritual cultural practices with which human beings respond to crises against the backdrop of an unchanging human biological existence, omits the crucial fact about modern life that Rabinow’s analysis identifies. Realms and processes that were once believed to be separate are now interpenetrating. *Zoë* is increasingly confused with *bios*, with the result that we are finding it harder and harder to define what life is, much less to decide whether we should attribute a variation we encounter to forces of nature or culture. (As I write, debates about the global decrease in sperm motility, like debates about global warming, demonstrate this category drift.) In

short, we need to move beyond Turner's exclusively cultural framing to understand liminality not merely as a cultural state but as a *biocultural process*.

Along with our increasing encounters with liminal lives—from adoptive embryos to transplant recipients to elderly Alzheimer's patients hoping for stem cell therapy—comes an increasingly urgent desire to understand what these new beings mean to us, socially, politically, and ethically. While Turner emphasizes the yeasty potential of liminality, Paul Rabinow reminds us of its less-pleasant consequences, especially the responsibility we feel to make ultimate sense of this new experience of biological and social ambiguity. He diagnoses us as suffering from “purgatorial anxiety,” a specific kind of liminality or in-betweenness characterized by “a chronic sense that the future is at stake; a leitmotif among scientists, intellectuals, and sectors of the public turning on redeeming past moral errors and avoiding future ones; an awareness of an urgent need to focus on a vast zone of ambiguity and shading in judging actions and actors' conduct; a heightened sense of tension between this-worldly activities and (somehow) transcendent stakes and values; and a pressing need to define a mode of relationship to these issues” (Rabinow 1999, 17–18). The distinction between Turner's liminality and Rabinow's purgatorial anxiety is worth pursuing, for the two concepts imply quite different assessments of the appropriate form for the life of an individual or a group, as well as two different time frames, reflecting the different religious domains from which they emerge. The liminal is an arena of possibility; the purgatorial is an arena of responsibility. The liminal has a referent in this world, while the purgatorial has an ultimate eschatological referent. Liminality challenges us to negotiate meaning right here and now, to invent it ad hoc, in culture and society, while purgatorial anxiety or purgatorial pressure (Rabinow uses both terms) gives rise to that “heterogeneous, heteronomic, heteromorphic” zone where the heuristic and the ultimate meanings jostle one another unsettlingly and productively (Rabinow 1999, 22). Rather than choosing between these two perspectives on our current in-between state, I find both of them illuminating. The latter reminds us of the responsibility we have to consider the long-term implications of our biomedical interventions, and the former reminds us of the inventive capacity of human beings to redirect, undo, or co-opt even the most seemingly inevitable trajectories of development.

Of course, whether a new development registers as promising or frightening has something to do with the perspective from which we view it. To the Nightlight Christian Adoptions service, the possibility of adopting frozen embryos appeals, no doubt, because it provides another way of working against abortion. To a woman carrying an unwanted fetus, the same idea poses a threat of governmental intrusion into her biological autonomy, while to the parent of a childhood diabetic, the notion that embryos are conceptualized legally as proto-persons, who can be adopted, may dash any hopes of using embryonic stem cells to generate a new therapy for a devastating genetic disorder.⁴ Even more important, we must understand that the responses to such liminal lives are not only arrayed as a conversation between different positions (i.e., mutually exclusive); they are also quite often both mutually contradictory and simultaneously present in us, whenever we sit down with our daily paper or log in to our e-mail news services. In the ambivalence and ambiguity of our responses to them, we also confront our own in-between state.

All these meanings enter into the way I understand the idea central to this study: liminal lives. I use the term to refer to those beings marginal to human life who hold rich potential for our ongoing biomedical negotiations with, and interventions in, the paradigmatic life crises: birth, growth, aging, and death. Then I view human beings living in the era of these biomedical interventions as liminal ourselves, as we move between the old notion that the form and trajectory of any human life have certain inherent biological limits, and the new notion that both the form and the trajectory of our lives can be reshaped at will—whether our own or another’s, whether for good or ill. The human bios is changing so quickly that *zoë*, the simple fact of being alive, is no longer stable. Turner’s notion of cultural liminality superimposed safely on a solid biological life no longer applies, with destabilizing consequences that reach from our cultural analyses to our medical practices, shifting the very ground of our being. The stories we tell about our lives—whether fiction or fact—are crucial maps to this shifting ground. One of the few places where liminality isn’t normalized into invisibility, these stories both register the impact of, and help us to navigate, the massive cultural and material transition produced by biomedicine. Drawing on the works of Bruno Latour, Paul Rabinow, and Michael Thompson (among others), I have come to understand that these limi-

nal lives function relationally. In other words, as I will go on to explore in what follows, the embryos and fetuses, the dying and the newly dead, the animals and humans whose stories I explore in the chapters to come function less as *nouns*—whether subjects of experience or objects of others' actions—than they do as *verbs*, enacting a reciprocal exchange between science and culture.

Caught between our sense of the tremendous possibility of the new biomedicine, and our purgatorial anxiety to account responsibly for its implications, we have been forced to craft new ways of making sense of these new configurations and assemblages of relations around us. We can trace the distinct effects of this representational liminality in both our cultural analysis and our fiction. In the academy, as we struggle to think through what it means for us as individuals and as a species to occupy this in-between state, we are experimenting increasingly with interdisciplinarity. We are learning that we must link our contemporary medical strategies for modifying things and people with our strategies of representation. If we do so, Rabinow suggests, we may well find a reciprocal relation between the new bodies and societies generated in this era and the new modes of representation coming into being. His suggestion that our current practices function both to instantiate (embed) and to represent (embody) these new recombinant bodies and societies is a crucial one. It reminds us that to discover the sources and significance of the new forms emerging in our era, we must engage in the same kind of boundary crossing that characterizes the new biotechnologies. We must examine practices in a range of social realms, from science, to art, to law, to literature. "We are witnessing, and engaged in, contestations over how technologies of (social and bodily) recombination are to be aligned with technologies of signification. The questions then are: What forms are emerging? What practices are embedding and embodying them? What shape are the political struggles taking? What space of ethics is present?" (Rabinow 1999, 16). Just as Rabinow recommends that we investigate the contested practices that instantiate and embody these new social and biological hybrid beings, so another scholar has returned to the performances foundational to Turner's theory of liminality—the spectacles, processions, exhibitions, and so on, that society uses to negotiate rites of passage—to argue that they fail to do justice to the experience of embodied materiality, because they privilege the cultural and symbolic. Instead, Sue Broadhurst

argues, we can turn to contemporary performance art to experience liminality in a wide variety of registers: spatial, temporal, topographic, existential, cultural, social, *and* biological (1999, 17). Arguing that the “experimental performative types” are engaged in a “radical transvaluation of corporeality,” she finds in their performances a rethinking of embodiment that simultaneously calls attention to its representational status and offers a nonlinguistic model for bodily experience. As Broadhurst defines them, the qualities that characterize liminal performances are attention to both the immediate body and the mediated body; a hybrid and self-reflexive aesthetic; use of digital media to challenge any notion of authorial or artistic singularity and differentiation; and reliance on a transformative notion of history that replaces the unitary, singular, and teleological with the multiple, disrupted, and ontological.

This extension of Turner’s theory of liminality challenges the boundaries of experience Turner took for granted. Harnessing the technoscientific realm of new media in the service of culture, Broadhurst explains how we attain the “immediacy of the body, including corporeal readings (visual, tactile, haptic, olfactory, gustatory, kinetic, proximic and so on),” via the cultural practice of performance art (Broadhurst 1999, 27). Becoming liminal is a two-way process, in other words: not only do we turn to culture to make sense of moments of biological change, but through our cultural practices—our performances—we are able to access, and indeed to produce, a range of meaningful changes in our bodies. The focus on performance can extend beyond embodiment to articulation.

Our analysis of the contestation over, and changes in, “technologies of signification” must include a reevaluation of the formal structure, aesthetic valuation, generic categories, and social position of fiction. In his polemical *We Have Never Been Modern* (1993), science studies scholar and anthropologist Bruno Latour begins the task of crafting a method. In what could be a mirror image of the InfoBeat news item with which I began, Latour’s opening pages survey the strange juxtapositions encountered in the daily newspaper, where news of frozen embryos jostles with stories of burning forests, the hole in the ozone layer, vials of contaminated AIDS virus, and an epidemic in sub-Saharan Africa (Latour 1993, 1–2). Latour begins with the daily newspaper because in its debt to temporality, it embodies the essence of modernity: “All its

definitions point, in one way or another, to the passage of time. The adjective 'modern' designates a new regime, an acceleration, a rupture, a revolution in time. When the word 'modern,' 'modernization,' or 'modernity' appears, we are defining, by contrast, an archaic and stable past" (10).

The columns of the daily paper embody a phenomenon central to Latour's analysis: the "proliferation of hybrids" (131). What are hybrids? The category is a huge one, and while it includes the liminal lives that are my particular subject, it also exceeds them, taking in any promiscuous intermixture of nature and culture, from tissue cultures to the ozone hole, from regulations for standardizing high-definition television to the debate about the provision of pharmaceuticals to sub-Saharan Africa. Hybrids can be discursive (like newspaper articles "that sketch out imbroglios of science, politics, economy, law, religion, technology, fiction"), or they can be material; they can even be human. So Latour says he and his friends are "hybrids ourselves, installed lopsidedly within scientific institutions, half engineers and half philosophers" (3). Latour argues that hybrids are a product of modernity itself, and specifically of what he calls "the Modern Constitution": the epistemological division between "the scientific power charged with representing things and the political power charged with representing subjects" (29). This division of the world into different sectors, each subjected to a different sort of analysis and criticism, produces the specific kind of hybrids we find in each column of our daily paper, where "all of culture and all of nature get churned up again every day" (2).

Latour's accomplishment is the invention, and demonstration, of an *anthropologie symétrique* for studying these hybrids. This is a method for integrating and understanding the interactions between nature, culture, and representation, or science, social science, and humanities, "these strange situations that the intellectual culture in which we live does not know how to categorize" (2). Mapped out in an impressive series of books from *Laboratory Life* (1979) through *Pandora's Hope* (1999), this method consists of a meticulous investigation of the tangled networks linking science and technology to culture.⁵ I will discuss this practice of networking in more detail in the first chapter, but here I will just observe that its effect is to open to anthropological scrutiny the assemblage of operations linking culture and society to science, medicine, and technology, realms of human activity that have typically

been exempted from analysis because they stress the individual discovery of natural fact rather than the collaborative production of cultural practices.

Latour's 1993 use of *anthropologie symétrique* to trace the networks producing the hybrids he identifies may seem at first to provide the basis for precisely the method for which Rabinow called in 1999: one that would enable us to make sense of the relations between technologies of recombination and technologies of signification. And yet there is one way in which Latour falls short of his own potential. In his survey of the dizzying hybridity of his daily newspaper, he finds a small zone of soothing stasis: "Fortunately, the paper includes a few restful pages that deal purely with politics . . . and there is also the literary supplement in which novelists delight in the adventures of a few narcissistic egos ('I love you . . . you don't'). We would be dizzy without these soothing features. For the others are multiplying, those hybrid articles that sketch out imbroglios of science, politics, economy, law, religion, technology, fiction. If reading the daily paper is modern man's form of prayer, then it is a very strange man indeed who is doing the praying today while reading about these mixed-up affairs" (Latour 1993, 2). The irony is evident: the literary and the political realms, both of which are prominent agents in the creation of a human subject, whether as an individual or a collectivity, and which therefore should be the realms to which we look in our purgatorial anxiety to make some meaning out of the confusing recombinations that surround us in our new biomedical era, are instead dismissed as soothing backwaters. The slap at politics is understandable, since Latour's goal is to open up the political realm beyond the strictly human "modern constitution" to a more embracing notion of (human *and* nonhuman) agency in the Parliament of Things. But for me, the curious position held by literature indicates the most intriguingly incomplete part of Latour's method. Though he indicts *literature* for being the province of narcissistic egos, he seems to privilege fiction when he includes it among the various phenomena thrown together in the journalistic imbroglios that are his focus. And in an interview the same year, he contradicts himself even more strikingly, asking, "How can we invent literary style for science studies, and how can we pursue the fusion of social science and literature?" (Crawford 1993, 267). How can we explain this seeming inconsistency? As I will argue in coming chapters, it is precisely in the distinc-

tion between fiction and literature, enforced by hierarchies of aesthetic value and by the invocation of generic taxonomies, that we can see played out the contestatory and constructive relation between the new biotechnologies (technologies of recombination) and new narrative forms and strategies (technologies of signification).

Other science studies scholars have begun to lay the groundwork for a reevaluation of the position of literature, granting it a role far more assertive than Latour's ancillary one. While Mary Hesse and Gillian Beer brought science studies into the realm of literature by demonstrating how analogy, image, and symbol provide a space for indeterminacy and thus creativity, Donna Haraway cleared the path for those exploring the role of literature in science studies by taking fiction seriously in *Primate Visions* (1989). More recently, Catherine Waldby has come at the question from the other side, proposing a notion based on Michelle LeDoeff's formulation of the philosophical "imaginary": "the deployment of, and unacknowledged reliance on, culturally intelligible fantasies and mythologies within the terms of what claims to be a system of pure logic" (Waldby 2000, 137). Waldby proposes that scientific practice, too, should include its ambiguous, liminal, and symbolic realm, which she calls the "biomedical imaginary." As Waldby understands it, this is the broader context in and from which biomedical creativity emerges: "the speculative, propositional fabric of medical thought, the generally disavowed dream work performed by biomedical theory and innovation. . . . [the] speculative thought which supplements the more strictly systematic, properly scientific, thought of medicine, its deductive strategies and empirical epistemologies" (136).

While in her work on the metaphoric construction of AIDS, Waldby stressed the "phallogentric and homosocial" aspects of the biomedical imagination, in her later work on the visible human project, she modifies her position to introduce more flexibility into the biomedical imaginary. Arguing that scholars should examine the images driving scientific thought for the ways that they manage the often anxiety-charged process of moving from the realm of the unsystematic imagination to the systematic realm of scientific practice, Waldby describes the biomedical imaginary functioning as "a form of representational practice," "a kind of 'science fiction,'" through which the conflicts and tensions of science are expressed, preserved, or sometimes worked out (Waldby

1996, 27). “While medicine, like all sciences, bases its claims to technical precision on a strict referentiality, a truth derived from the givenness of the object, the biomedical imaginary describes those aspects of medical ideas which derive their impetus from the fictitious, the connotative and from desire” (Waldby 2000, 136–37).

Waldby’s useful concept alerts us to the existence of multiple sites and forms for scientific creativity, which can be found not only in systematic, experimental science but also in images, fantasies, speculations, and fictions. We investigate the biomedical imaginary when we consider how medical issues are articulated and engaged with across all cultural fields, from medicine to government to popular culture and religion. Moreover, in its emphasis on the fictionality of medical thinking, its expression in images, metaphors, and “generally disavowed dream work,” Waldby’s notion of the biomedical imaginary provides a crucial new direction for investigating any biomedical development (Waldby 2000, 136). Focusing on something with so marginal a relation to medicine’s self-description challenges the boundaries of the discipline. Inverting the hierarchy of disciplinary value, Waldby’s questions productively open up new lines of inquiry and reveal not only how the discipline of medicine produces knowledge but also how it enforces ignorance.⁶ To put it another way, the very fact that imagery and metaphor are thought to be sites extraneous to science suggests the investment science has in the marginality and obscurity enabled by those discursive modes. Thus we can look to imagery and metaphor for the expression of excess fantasy and desire, finding therein those sites of unresolved tension, cultural paradox, and stubborn ambiguity that are a crucial, if generally overlooked, aspect of biomedicine. What Donna Haraway has called the “traffic” between different discursive realms appears here as a reciprocal shaping effect. Just as scientific thinking appropriates the ambiguity afforded by nonscientific images and metaphors, so too scientific discourse and imagery can be appropriated by the broader culture, with results that can have broad, if unpredictable, results: “Once medical images leave the strictly regulated contexts of the scientific media, their debt to the imaginary, the speculative, to desire, the fictive, to particular cultural genres and stock narratives, becomes less readily ignored. The intertextuality of scientific images is more evident at these points of popularisation, and this intertextuality

implies that the interpretation of images by different nonscientific audiences can lead off in a number of directions and is open to various orders of appropriation" (Waldby 2000, 138–39).

Whether they exist as fiction or as nonfiction, the narratives spawned by or produced in relation to biomedicine can be categorized as working objects, research reservoirs, or biological resources for the reconfiguration and extension of the human life span (Latour 1993; Daston and Galison 1992). Yet in calling them "working objects," I am deliberately stretching the usual meaning of the term, for it usually refers to "objects in [laboratory or scientific] process, which can be used experimentally to test out certain morphological and biotechnical propositions" (Waldby 1996, 99). In my adaptation of the term, I understand *narratives* to function as working objects, in experiments that take place not in the biomedical laboratory but in the biomedical imaginary: the rich intertidal zone where, as Waldby puts it, "biomedicine *makes things up*" (32). In other words, Waldby explains, biomedicine "realizes, or struggles to realize, these narratives through their embodiment. It *anatomizes* its narratives in the sense that it orders its images of bodies according to their logic, but it also anatomizes them in the sense that it reads into lived bodies in ways that are constitutive of important aspects of corporeality itself" (32). Considered as working objects, narratives exist in a reciprocal relation to the lived bodies that are their ultimate referent: both constituting and being constituted by them. Narratives thus provide an alternative to the impossible attempt to distinguish nature from culture, science from society; a site where we can productively consider their mutual imbrication and cogeneration. I will explore a number of narratives generated by the biomedical imaginary in the chapters that follow, including poems about tissue culture, short stories about organ transplantation, and a novel about artificially accelerated human growth. While none of these works (except possibly Wells's *Food of the Gods*) would make the cut for the category of "literature," all of them actively demonstrate how fiction operates as a technology of signification, generating biocultural meanings from the new technologies of recombination.

This book offers case studies in an adapted anthropologie symétrique, working between the biomedical and the nonscientific, between cultural genres, stock narratives, and expert discourses. In each chapter, I consider a node of relations that combines science, social sciences,

and the humanities. The liminal lives I focus on, inherently unstable, are the product of a volatile convergence of disciplines, discourses, practices, events, and people. To survey and assess the variety of new paradigms for life generated at these nodal points of biomedicine and culture, I trace the networks connecting different realms of discourse and practice, from the strictly regulated and systematic to the unsystematic and uncharted.

Though my interest lies in the way that biotechnology is reshaping the human body—that whole range of interventions including embryo culture, in vitro fertilization, growth hormone administration, interspecies fertilization as part of assisted reproduction, stem cell therapy, xenotransplantation, and fetal cell transplantation—I approach this topic not through biomedicine but through narrative, both fiction and nonfiction. Because my interest in these stories of biomedical interventions is both theoretical and methodological, let me go on to say a bit more about why I look at both fiction and nonfiction narratives.

I understand fiction as a crucial site of permitted articulation for the desires driving these new biotechnologies: I am using this term broadly enough to encompass all linguistic play with *what might be*, all transgressions of the (socially constructed) boundary of fact, including the imaginative play of poetry. Fiction gives us access to the biomedical imaginary: the zone in which experiments are carried out in narrative, and the psychic investments of biomedicine are articulated. Moreover, fiction is devalued, epistemologically and disciplinarily, by many scholars committed to objectivity and referentiality; fiction is thought not to possess truth, to be false. Ann Curthoys and John Docker point out that the struggle between history as science and history as narrative has since the eighteenth century been waged on the terrain of fiction. Thus even to ask, “Is history fiction?” is tantamount to implying the counter-implication: “Or does history tell the [scientific] truth?”⁷

Yet fiction, the zone where objective truth is not told, paradoxically becomes the site where one specific kind of truth is best articulated: the workings of the biomedical imaginary, the desires propelling biomedicine, can be expressed in fiction. Freud’s brilliant essay “Negation” (1925) helps to clarify how this process works, by using a kind of conditional articulation to trick the forces of repression: “the subject-matter of a repressed image or thought can make its way into consciousness on condition that it is denied” (Freud [1925] 1959, 213–14).

As Freud explains, “Negation is a way of taking account of what is repressed; indeed, it is actually a removal of the repression, though not, of course, an acceptance of what is repressed” (214). It is precisely the denial of truth inherent in fiction that makes it such a good vehicle for our repressed impulses and desires. We protect ourselves from acknowledging them, and from having to deal with their consequences, by articulating them in fiction, the untrue zone. This book explores a range of narrative strategies that are engaged in subject production in two different ways, then: fictions, which monitor the production of acceptable subjects (of government, of nation) through the generation of a boundary zone beyond which facts cannot be found; and government documents, which define and thereby produce the factual subjects that they frame and hail.

To understand how the very fictional status of a narrative performs a special function in articulating the repressed of the biomedical imaginary, we need to begin by establishing the difference between any narrative and fiction, and between literature and science fiction. (As I will go on to argue, genre shapes the cultural role available to each.) To begin with, narrative consists of a story or the representation “in art” of an event or story, as distinct from fiction, which is something invented by the imagination, or the act of taking something possible as if it were a fact, irrespective of the question of its truth (*Webster’s Ninth Collegiate Dictionary*, s.vv. “narrative,” “fiction”). Historians have been dogged by the distinction between the two entities, worried that to narrate history was inevitably to fictionalize. Narrative for historians has depended for its authority on the assumption that it was transparent and nonfictionalizing. Yet this fiction/fact dichotomy is increasingly problematic for the discipline of history. As Curthoys and Docker point out, recently historians have been sensitized to the ways that the generic demands of narrative shape the histories that we tell. “The historical narrative points in two directions simultaneously,” they observe, “toward the events reported in it, and the ‘generic plot-structures conventionally used in our culture’” (Curthoys and Docker 1999, 3).⁸ While the legacy of poststructuralist historiography has produced a healthy skepticism concerning the referentiality of historical narrative, it has not catalyzed a similar willingness to scrutinize the constructedness of the seemingly eternal categories of narrative genre.

The aesthetic and formal implications of the changes in human life

wrought by biotechnology are registered by, as well as enforced through, literature. Yet genre variations are a crucial component of the articulation I am exploring. That is where the distinction between literature and science fiction comes in. As I will argue, we are now seeing a shift in the social valuation of science fiction, a shift in how we draw the line between “fiction” and “fact” that is related to the changing understanding of the human being produced by biomedicine. In short, the transformative processes of biomedicine are *enabled* somehow by the transformative narrative that is science fiction.

To understand how the specific subgenre of science fiction can function transformatively in culture at large, we first need to understand the literary category of genre more broadly. Rather than adopting either the deconstructive or sociological approach to literature—either textualizing all forms of social relations or positioning literature as the passive recipient of all social forces—I share with the cultural studies theorist Tony Bennett an understanding of literature as an active agent in social formation, “an institutional site providing a specific set of conditions for the operations of other social relations, just as those relations, in turn, provide the conditions for its own operation” (Bennett 1990, 108).⁹ The crucial point here—and one that remarkably parallels the networking approach of Bruno Latour—is the *reciprocity* of relations between literature and other social formations (including science). “In this view, literature is regarded as itself directly a field of social relationships in its own right . . . which interacts with other fields in which social relationships are organized and constituted *in the same way as they interact with it and on the same level*” (108).

When we understand literature as a field of social relationships rather than a set of forms internal to the text itself, we are doing to texts what Latour encourages us to do to a scientific fact: to open the black box or to arrive before it has been sealed. Rather than accepting the autonomy and self-evident status of the text, Bennett suggests, we need to explore how the text consists of a set of social relations. This means not only do we understand its actual production in relation to that set of social relations, something that is fairly easy for us to do if we consider presses, readers, distributors, and reviewers, but we also need to understand literature’s *form* and *consumption* as the product of social negotiations. Here is where Bennett’s theory of genre is so helpful. He argues that our task, as analysts of literary genre, is neither to identify

or categorize genres, nor to see how they passively take the impress of society, but rather to consider them as nodes of social practices. Genre theory should be concerned, he argues, “with the ways in which forms of writing which are culturally recognized as generically distinct . . . function within the ‘forms of life’—the specific modes of organized sociality—of which they form a part” (Bennett 1990, 108–9). So our task in genre study is to see how different genres function as part of the set of networked relations—relations that extend all across the social field from the material to the semiotic—in which they are imbricated.

The rhetorician Anis Bawarshi shares the contextual approach to genre, suggesting that we think of genre not only as a classificatory term in literary and aesthetic discourse but as a category that has sociological and cultural meaning. Genre is both a regulatory and a constitutive category, he argues; it shapes how a preexisting social practice can be entered and engaged in, and it constitutes that social practice, giving us ways of understanding and engaging in it, giving us the conventions that make it possible for us to enact that practice (Bawarshi 2000, 340). The process by which genre works to regulate and constitute practices is complex. We generate genres as labels for specific rhetorical situations, so that we know one set of things as *fictional* and another as *factual*, or one set of representations as *realistic* and another as *gothic* or *science fictional*. And then, through the process of living with them, those labels become not only descriptive but prescriptive. As Bawarshi explains in “The Genre Function,” “as individuals’ rhetorical responses to recurrent situations become typified as genres, the genres in turn help structure the way these individuals conceptualize and experience these situations, predicting their notions of what constitutes appropriate and possible responses and actions. This is why genres are both functional and epistemological—they help us function within particular situations at the same time they help shape the ways we come to know these situations” (Bawarshi 2000, 340). In short, genres govern the structures within which we interact, as well as our actions within those social structures.¹⁰

Liminal Lives engages in a networked analysis of fiction and non-fiction narratives, exploring in each chapter one node in the reconfiguration of the life span, or one of the liminal lives that are my focus. I begin with a chapter setting out my methodology for working with the relations between literature and science, described in relation to