

# SENSORY EXPERIMENTS

PSYCHOPHYSICS, RACE,  
*and the Aesthetics*  
OF FEELING

.....  
*Erica Fretwell*

## SENSORY EXPERIMENTS

BUY

# *Sensory Experiments*

PSYCHOPHYSICS, RACE, AND THE AESTHETICS OF FEELING

Erica Fretwell

DUKE

DUKE UNIVERSITY PRESS DURHAM AND LONDON 2020

UNIVERSITY  
PRESS

© 2020 DUKE UNIVERSITY PRESS

All rights reserved

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

Designed by Amy Ruth Buchanan

Typeset in Arno and Avenir by Westchester Publishing  
Services

Library of Congress Cataloging-in-Publication Data

Names: Fretwell, Erica, [date] author.

Title: Sensory experiments : psychophysics, race, and the  
aesthetics of feeling / Erica Fretwell.

Description: Durham : Duke University Press, 2020. |  
Includes bibliographical references and index.

Identifiers: LCCN 2019054741 (print) | LCCN 2019054742  
(ebook) | ISBN 9781478009863 (hardcover) |  
ISBN 9781478010937 (paperback) | ISBN 9781478012450  
(ebook)

Subjects: LCSH: Psychophysics. | Senses and sensation—  
Social aspects. | Racism—United States—Psychological  
aspects. | Racism—United States—History—19th century. |  
Science—Social aspects—United States—History—19th  
century.

Classification: LCC BF237 .F74 2020 (print) |

LCC BF237 (ebook) | DDC 152.10973/09034—dc23

LC record available at <https://lcn.loc.gov/2019054741>

LC ebook record available at <https://lcn.loc.gov/2019054742>

DUKE UNIVERSITY PRESS GRATEFULLY ACKNOWLEDGES THE UNIVERSITY AT ALBANY, SUNY, WHICH PROVIDED FUNDS TOWARD THE PUBLICATION OF THIS BOOK.

DUKE  
UNIVERSITY  
PRESS

IN MEMORY OF STEVEN FRETWELL

**DUKE**

UNIVERSITY  
PRESS

## CONTENTS

*Acknowledgments* IX

*Introduction: NEW SENSATION* 1

{ 1 } *Sight* UNRECONSTRUCTED BODY IMAGES 35

INTERVAL 1 *Colorful Sounds* 79

{ 2 } *Sound* THE ACOUSTICS OF SOCIAL HARMONY 87

INTERVAL 2 *Notes on Scent* 124

{ 3 } *Smell* PERFUME, WOMEN, AND OTHER VOLATILE SPIRITS 131

INTERVAL 3 *Olfactory Gusto* 167

{ 4 } *Taste* SCRIPTS FOR SWEETNESS, MEASURES OF PLEASURE 174

INTERVAL 4 *Mouthfeel* 213

{ 5 } *Touch* LIFE WRITING BETWEEN SKIN AND FLESH 221

*Coda* AFTERLIVES AND ANTELIVES OF FEELING 257

*Notes* 265

*Bibliography* 289

*Index* 313

DUKE

UNIVERSITY  
PRESS

## ACKNOWLEDGMENTS

This book proceeds from the position that literature gives tangible shape to the amorphous fantasies, feelings, and histories that hover just below legibility. In the spirit of beginning this new relationship with you, dear reader, as though it were an old friendship, here are a few fantasies of how this book became legible to me:

Brian Price and Robert Gunn modeled intellectual curiosity, analytical precision, and deep generosity in ways that opened me up to the kind of person I could become and the kind of company I wanted to keep. It is difficult to overstate the impact that Rob in particular had on my scholarly trajectory. His intellectual companionship and emotional support (I was learning the self-doubt that academic writing produces) made all the difference. Simultaneously, a workshop led by Kyung-Sook Boo catalyzed fruitful kinship with fellow travelers Alicia Christoff and Lindsay Reckson. For more than fifteen years, Lindsay and I have been thinking, feeling, and thinking feeling together. Dear Lindsay: friendship as citational feedback loop.

Other fantasies of origination include reading Michael Taussig's work on colonialism and mimesis in an undergraduate anthropology course. Or a decade later, when I taught a course on Emily Dickinson's poems, and in recognizing the extravagance of her introversion came to recognize myself. Still another: high school English teacher Beverly Wheeler (née Porrazzo) taught

D

UNIVERSITY  
PRESS

me formal analysis, which thickened the immediate pleasure of reading with titillating intellectual drama.

Tina Campt, Cathy Davidson, Thavolia Glymph, Karla FC Holloway, and Rebecca Stein all pushed me to think more rigorously and more capaciously about everything. Tom Ferraro encouraged me to pursue the intuitions that originate in the solar plexus, no matter how kooky they might appear. Fred Moten's intellectual generosity is a kind of grace (I may be Jewish but we are all Protestants anyway, h/t Tracy Fessenden). Priscilla Wald's intellectual kinship, steadfast support, and profound compassion have been foundational to all iterations of this book. In the seminar room, on the East Campus street hockey court, and in bars long since gone (RIP Joe & Jo's), I was lucky enough to move among people of unsurpassed passions: Lindsey Andrews practices thinking as radical sociality; Ashon Crawley models criticism as a creative practice; Nihad Farooq doles out care and brilliance in equal measure; Britt Rusert was a mentor to me, although she may not have known it; Casey Wasserman schooled me in the gospel of James Brown. The Franklin Humanities Institute provided a fantastic year of dissertation writing and reading, and it brought me into contact with some of my favorite people: Ignacio Adria-sola, Natalie Carnes, and Brian Goldstone. Hey, guys, I'm glad we found one another. Layla Aldousany, Leah Allen, Sarah Almond, Anne-Marie Angelo, Fiona Barnett, Kaila Brown (Joy Division helps me keep your memory), Christopher Catanese, Meredith Farmer, Anne Gulick, Alexis Gumbs, Nathan Hensley, Patrick Jagoda, Keith Jones, Lisa Klarr, Kevin Modestino, Tim Wientzen, Jenny Woodruff, and Timothy Wright helped me figure things out. So too did the companions many of us found along the way, most of whom have moved on to happier trails: Rufus, Max, Liza, Clark, Astro, Fido and Jada, Jack, and Casey. Special thanks to my daughter and kindred spirit Clementine, who buoyed me through grad school loneliness and those bad relationships you have in your twenties. Miss you, darling.

However this book got its start, many people have contributed to its incubation, recognizing my project in ways I had not (yet). Some have heard, read, or responded to portions of this book, while others have offered personal encouragement and professional advice along the way. For all these kindnesses and more, thank you, Sari Altschuler, John Levi Barnard, Dorri Beam, Nancy Bentley, Sarah Blackwood, Pat E. Chu, Matt Cohen, Michael Collins, Peter Coviello, Brad Evans, Erin Forbes, Brian Hochman, Monica Huerta, Toni Wall Jaudon, Catherine Keyser, Lauren Klein, Sarah Lincoln, Dana Luciano, Cody Marrs, Molly McGarry, Rachael Nichols, Carrie Noland, Eden Osucha,



Samuel Otter, Jamie Pietruska, Samantha Pinto, Sophia Roosth, Kelly Ross, Kyla Schuller, Susan Schweik, Gillian Silverman, Gus Stadler, Ed Sugden, Kyla Wazana Tompkins, and Marta Werner. Merci, Christen Mucher, Tessa Paneth-Pollak, and Jordan Stein for your casual expertise in French. J. Michelle Coghlan, Nicholas Gaskill, Justine Murison, and Emily Ogden are my ideal readers and, praise the gods, they have been my real readers, too.

Many thanks to the audiences at the Université Paris-Diderot, Katholische Universität Eichstätt-Ingolstadt, and the Center for Cultural Analysis at Rutgers University. Cécile Roudeau and Julia Faisst are unmatched in their hospitality. Thanks to the fellows at the Freiburg Institute for Advanced Studies, especially Barbara Mennel, as well as to Laura Bieger, Dustin Breitenwischer, and Winfried Fluck. The 2016 C19 seminar led by Laura Wexler and Shawn Michelle Smith was especially fruitful; I am thankful to them and to the seminar participants for their crucial insights. Gratitude is equally due to Eric Lott, whose seminar at the 2010 Futures of American Studies Institute involved lively conversations with Ashley Carson Barnes, Alex Black, John Charles, Alex Corey, Michele Fazio, Brigitte Fielder, Jack Hamilton, Elissa Underwood Marek, Ann Mattis, Philip Nel, Jonathan Senchyne, and, providentially, Todd Carmody.

This book has received support from the American Philosophical Society and from the VW-Mellon Foundation. I was able to spend my first semester back from maternity leave doing only research (teaching- and service-free) thanks to the Dr. Nuala McGann Drescher Leave Award, sponsored by New York State United University Professions, ever fighting the good fight. Support unions! The University at Albany Faculty Research Awards Program covered important research-related expenses.

I am lucky to work in a department that actively protects the research time of junior faculty, especially under conditions of calculated scarcity. My colleagues at the University at Albany (SUNY) have taken on additional labor, and I am eager to pay it forward. Thanks to comrades Richard Barney, Bret Benjamin, Jeff Berman, Helen Elam, Glyne Griffith, Mike Hill, Aashish Kaul, Eric Keenaghan, Kir Kuiken, Michael Leong, James Lilley, Ineke Murakami, Wendy Raphael Roberts, Helene Scheck, Ed Schwarzschild, Charles Shepherdson, Paul Stasi, Laura Tetreault, Lynne Tillman, and Laura Wilder. And I do not want to think where I would be without the profound patience and the institutional knowledge of Lynn Bearup, Kathleen Cummings, Liz Lauenstein (much missed), and Karen Williams. Bianca Englese has been immensely helpful in the short time since she arrived.

Gordon Hutner supported this book early on and provided important professional guidance. It was a sheer pleasure to work with Eric Zinner and Dolma Ombadykow at NYU Press; many thanks to series editors David Kazanjian, Elizabeth McHenry, and Priscilla Wald for their advocacy. I am happily and endlessly indebted to the two readers for NYU Press as well as to Hsuan Hsu and the second reader for Duke University Press. Thank you for your rigor, for your profound care, for seeing my book for what it was while guiding me toward what it could become. Elizabeth Ault at Duke University Press has been with me every step of the way; I couldn't ask for a steadier, more supportive editorial hand. Thank you to Kate Herman, Ellen Goldlust, and all those at Duke University Press who have worked behind the scenes (or rather, between the covers) to make this book happen.

Stephanie Foote generously invited me to edit a special issue of *Resilience: A Journal of the Environmental Humanities* on sensory studies. Thanks to the journal's editors and to the issue's contributors, whose brilliant essays helped shape the book. Portions of an earlier version of chapter 4 appeared as "Emily Dickinson in Domingo," *J19: The Journal of Nineteenth-Century Americanists* 1, no. 1 (2013), and portions of an earlier version of chapter 5 appeared as "Stillness Is a Move: Helen Keller and the Kinaesthetics of Autobiography," *American Literary History* 25, no. 3 (2013).

For all the forms that their companionship has taken, thank you to Sarita Cannon, Lina Assad Cates, Sam Contis, Andrea Haslanger, Kaitlin Hedberg, Katherine Hunt, Drew Kane, Vesna Kuiken, Anna Lyman, Wendy and Jesse Roberts, Tanaz Moghadam, and Kendra Sena. I'm so lucky to be in your orbit. And everlasting thanks to the family: Esther, Fay and Gordon, Roslyn (much missed), Jeff, Jenny, Stu, Amanda and John, Andrew and Jamie, Jan and Charlene, and the whole Carmody crew. Wendy and Padraic clocked in months of childcare so that I could get this book done. I continue to reap the benefits from the impassioned curiosity and unconditional love that Robin and Steve practiced. Thanks for all that you do, Mom. Miss you, Dad, every single day.

Noam brings the sunshine. Ruby brings the silly. Todd brings it. Whether focused on big questions, finer points, or schematic issues, his sharp eye has made this book what it is. He has read multiple (nay, multitudinous) drafts of every single page you are about to read—all in addition to his own work researching, writing, and teaching under precarious conditions, and all in addition to the lifelong work of forging a shared life together as partners and parents. This abundance of love is humbling, and it tests the limits of language.

# Introduction

NEW SENSATION

..... All men are not created equal in the pursuit of sights,  
sounds, olfactory and other sense perceptions. . . .

There are more states of consciousness than there are  
States of the Union.

—"A Case for Sympathy," *Harper's Weekly*

.....  $g = k (\log b/b)$

—Gustav Fechner, *Elements of Psychophysics*

As the nineteenth century came to a close, African American thinker, writer, and activist W. E. B. Du Bois responded to a long-standing query "between me and the other world." How does it feel to be a problem? "It is a peculiar sensation, this double consciousness, the sense of always looking at one's self through the eyes of others, of measuring one's soul by the tape of a world that looks on in an amused contempt and pity. One feels his twoness—an American, a Negro; two souls, two thoughts, two unreconciled strivings."<sup>1</sup> Reflecting on the internal turbulences of the so-called Negro Problem—the pathologizing discourse of black immorality and indolence that took hold after Reconstruction—Du Bois famously describes double consciousness, the concept of a sense of self shaped by the outside world, by other people's perceptions. Du Bois considered double consciousness the defining feature of black life, more elemental even than social structures of racial subordination such as sharecropping. Today *How does it feel to be a problem?* tells a familiar story about the lived experience of the color line under Jim Crow segregation—so familiar, in fact, that we risk losing sight of how counterintuitive this question would have been to Du Bois's first readers. What do everyday feelings

DU BOIS  
UNIVERSITY  
PRESS

have to do with entrenched racial hierarchies? What makes consciousness germane to notions of human difference, the purview first of natural history and then of natural science? Why might qualitative sensations be a useful tool for social analysis? Du Bois's enduring account of double consciousness boldly claims what we likely take for granted: that feeling is part of what it means to "be a problem," that the meaning ascribed to blackness (rather than blackness as such) is the problem. For Du Bois to limn the perceptual reality of racial difference, a new conceptual framework for consciousness had to be built. Psychophysics, the science of sense experience, supplied this framework—along with new experimental methods, new regulatory techniques, and a new aesthetics. To uncover how being a problem became a matter of consciousness, then, is to encounter the creative uses to which psychophysics was put under a social order that constructed human difference as a problem.

Developed and practiced by E. H. Weber, Gustav Fechner, and Hermann von Helmholtz between 1840 and 1880, psychophysics was an experimental science that tested people's subjective responses to auditory, gustatory, olfactory, tactile, and visual stimulation. It was the immediate precursor to experimental psychology but today is largely hidden from view. Psychophysics appears sparingly in histories of pragmatism (C. S. Peirce corresponded with Helmholtz) and of psychoanalysis (Sigmund Freud attended some of Fechner's lectures). The most rigorous accounts of it are to be found in media history; scholars from Friedrich Kittler to Jonathan Crary have argued that psychophysics, as the first science to isolate, measure, and map out human perceptual functions, paved the way for new technologies like the phonograph and, more nefariously, ushered in new techniques of bodily discipline that ensured a more "productive, manageable, and predictable" subject.<sup>2</sup> Today's critical landscape therefore offers a bifurcated view of psychophysics: as either a footnote in the history of ideas or a hegemonic science in the service of liberal biopower. One consequence of this bifurcation is that we have forgotten what psychophysics also made possible: a new theory of sense experience as a fundamentally creative endeavor that orients body-subjects to each other in ways that may reflect but might also refract dominant social formations.

Psychophysics was a science. But more precisely, and by way of metaphor, it was a triptych, a multifaceted field of knowledge that treated sense experience as the hinge attaching empiricism, aesthetics, and metaphysics; it advanced sense experience as a vector of lived know-how, as the embodied habitus of emotional reflection, and as a relational sign that correlates

mind and matter. These concepts were far from esoteric and in fact found a wide audience via general periodicals, the most influential means in the nineteenth century of spreading scientific views to the public.<sup>3</sup> But whereas other sciences reached U.S. audiences in books and lecture halls as well, for psychophysics, Americans relied almost exclusively on secondhand reports because the texts were rarely translated into English.<sup>4</sup> The public learned about psychophysics through essays such as botanist C. J. Sprague's "What We Feel" (1867), which informed readers of the *Atlantic Monthly*, "It would seem folly for anyone to maintain that grass is not green, that sugar is not sweet, that the rose has no odor and the trumpet no tone, [yet] the greenness, the sweetness, the fragrance, the music, are not inherent qualities of the objects themselves, but are cerebral sensations."<sup>5</sup> In this fashion, a host of cultural critics and science writers repackaged psychophysics to nonexpert readers. That their essays ran alongside editorials, poems, and advertisements meant that psychophysics was tightly woven into the fabric of U.S. politics, art, and commerce. The century's dynamic textual milieu thus secured the new relevance of "what we feel" to the cultural conditions shaping what feeling can mean.

While psychophysics circulated widely in the United States, it found a foothold there because it suggested a model of interiority that partook of yet simultaneously moved past the biological materials (nerves, blood, etc.) now coming to define human difference. Between 1860 and 1910—an epoch bookended by Fechner's naming of the science and the death of his U.S. philosophical heir William James—the pronounced attention to the senses marked a response to concerns about a social order increasingly sponsored by biology. In its own moment, psychophysics moved along a trajectory asymptotic to that of evolutionary racial science: individual variations in sense experience approached but did not quite align with the new biological theories of human variation powered by the concept of heredity. Notably, evolutionary science considered race a plastic substance and, more specifically, the neurophysiological capacity to feel—the responsiveness of the nerves to external stimulation—a means of accelerating racial and species development.<sup>6</sup> Psychophysics did not directly address human biology, but it did claim that feeling was both embodied *and* irreducible to bodily processes: a material phenomenon that nonetheless exceeds the nervous and viscous matter of race. By studying feeling on the incipient phenomenological terrain of lived experience, rather than on the older epistemological grounds of sentiment, psychophysics equipped Americans with the means to pressure dominant

classifications of the human while articulating the inner reality of biologized social taxonomies.

This book recovers the U.S. cultural life of psychophysics to tell the story of how human difference became a sensory (auditory, gustatory, olfactory, tactile, and visual) experience. It argues that postbellum writers and thinkers drew on this forgotten science to conduct their own sensory experiments into the emotional microdynamics of being and belonging. Their creative work both explored and exploited bodily sensations, pressed in on by historical events (the Civil War), social reform (racial uplift), restrictive stereotypes (the super crip), cultural institutions (domesticity), and biopower (eugenics)—all while sketching out possibilities for intimacies and attachments that might evade their disciplinary effects. Psychophysics motivated writers, artists, and cultural producers in different ways and to different ends. Spanning medical case studies, memoirs, photographs, perfumes, poems, novels, and recipes, these projects signaled a shared effort to elucidate the utterly ineluctable but always incomplete project of subjectification from within and below. Attuned to this dynamic archive, *Sensory Experiments* tells an alternate story of modern social formation: of how the scientific fracturing of feeling into an assemblage of fine-grained perceptions engendered small-scale techniques of differentiation (i.e., racialization and gendered sexualization) as well as new genres for calibrating the collective yet contingent meanings of human difference. This story reveals that in the postbellum period, the generic “formalism” of the five senses became a vehicle for a critique of sensorial discipline and an affirmation of sensory world making.

The creative project that constellated around psychophysics aimed to make bodily difference fundamental to the fact of consciousness. I call this project *psychophysical aesthesis*. Aesthesis is the etymological root of *aesthetics*, denoting the “perception of the world by the senses,” and it nicely encapsulates the psychophysical revaluation of sensation as lived experience.<sup>7</sup> The texts gathered under psychophysical aesthesis are all animated by the tension between biological configurations of human difference and more “occult” modes of consciousness, feelings that are profoundly embodied and embedded in the world yet escape complete empirical capture. Neither inherently disciplinary nor inherently liberatory, psychophysical aesthesis enforced the vulnerability of some groups while certifying the experiential reality of that vulnerability. What emerged, then, was a seemingly redundant “aestheticization” of the senses: sight, sound, smell, taste, and touch became embodied conventions, or what I call *genres of feeling*, that mediate the fluctuating relation between

self and social world. Contra the collective consciousness or identity formations that typically predominate in accounts of the nineteenth century, these sensory feelings constitute decidedly *informal* or even microhistorical modes of relation that do not consistently serve definable social forms—they move among subjects who strive to, refuse to, or simply do not see themselves as part of a particular group or community. In this book, a specular image, the lilt of a voice, a whiff of perfume, a sweet aftertaste, and a caress are all sites of ever-shifting social meanings and shared possibilities.

Advancing psychophysical concepts and methods, the U.S. project of psychophysical aesthesis reframed the sensory body as a problem not simply of politics or epistemology but of ontology. Indeed, psychophysics itself is something of the secret ingredient baked into our most robust accounts of feeling, especially the phenomenological and the posthumanist strains of affect theory. By centering the body in individual sense experience, psychophysics laid the grounds for landmark feminist and queer phenomenologies, which study the uneven impact of power on everyday embodiment and emotions.<sup>8</sup> At the same time, the psychophysical theory of feeling as intersubjective, as a process of relation between mind and matter, inflects critical orientations like the new materialisms. This tradition in particular, influenced by the philosophy of relational ontology advanced by thinkers from Baruch Spinoza to Gilles Deleuze and Brian Massumi, is largely organized around the axiom that to affect is to be affected.<sup>9</sup> Accordingly, affect appears as a preconscious intensity that moves through porous bodies, operates through flux rather than fixity, and installs immanent relationality in place of individual agency. As a central yet neglected node in the critical genealogy of affect, then, psychophysics today is likely to feel more familiar than foreign, a rather uncanny return borne out in the language of thresholds, intensities, and wavelengths, as well as in the just-noticeable, nonlocalizable affects we have taken to calling “ambient.” *Sensory Experiments* moves backward into psychophysics to extend our theories of affect further—toward a more thoroughgoing account of how bodies differentially amass ontological weight, of how gendered, raced, and disabled being (rather than gender, race, and disability as such) becomes “a problem.” This psychophysical history of affect helps us recover the barely perceptible yet full-bodied feelings that structure the existential drama of everyday living, from an amputee whose phantom limbs call life itself into question to a cook whose sweet tooth turns domesticity into a feral state of being.

At the interface of science studies and affect theory, where a lost science gives way to a materialist account of ordinary feeling, *Sensory Experiments*



illuminates the new psychophysical methods for determining and new languages for describing what human difference feels like. Having catalyzed a notable turn away from the regulation of raw sensation and a turn toward the psychical remainder thereof, psychophysics constitutes an important if ignored entry point into the storied entanglement of affect and power. Viewing the sensory body as at once a corporeal and creative phenomenon—as biological yet stretching into the domain of the symbolic, where worlds signify in the process of their own becoming, where vertical social arrangements might not be sustained—psychophysics furnishes us with an account of feeling that is disciplinary but not strictly so. It is therefore poised to intervene in the characterization of sentimentality as the definitive means of managing affect in the nineteenth century. In short, psychophysics is the vehicle by which we arrive at the meanings of human difference installed and imagined by sensory experiences. This new genealogy brings into view psychophysical aesthesis, which transformed the senses into genres of feeling, the intimate modes of relation (to the dead, to family, to the air, to dessert, to oneself) mediating the ontological differentiation of people and things. Taken together, these genres of feeling offer an important account of the psychical depths of “external” power structures: spirit photographs activate an existential crisis that is also a racial one; acoustic resonance models social harmony; synthetic perfumes denature queer and cross-racial desires; sweetness occasions aesthetic lawlessness; and touch tells a story of self deformation. In what follows, I establish psychophysics as a “speculative science” that enjoins physiology to metaphysics, then elucidate the two main concepts animating psychophysical aesthesis: *perceptual sensitivity*, a mode of sense discrimination that crosscuts aesthetics and eugenics, and the *sign theory of perception*, which holds that sense experience is both a material and semiotic relation between self and world. This framework shows that the five senses became bodily techniques for navigating the emotional vicissitudes of the postbellum era’s vertiginous social landscape while serving the book’s broader insistence that being a problem is a sensory configuration.

#### A SPECULATIVE SCIENCE

What attracted U.S. thinkers and writers to psychophysics was its conceptual flexibility. Taking shape as the modern research university took hold, in a moment when academic disciplines were coagulating but had yet to calcify into distinct research programs, psychophysics straddled empiricism and meta-



physics; it wagered that science could still be a philosophy. Offering up measurements that doubled as meditations, psychophysics bridged the widening gap between the epistemic communities of natural science and the humanities, or “human sciences.” It was uniquely poised to do so because it was not a formal discipline; E. H. Weber was a professor of anatomy, Hermann von Helmholtz was a professor of physiology and then of physics, and Gustav Fechner was a professor of physics who lectured on philosophy. Within this disciplinary context, psychophysics was less a discrete field and more of an orientation, defined by science historian Lynn Nyhart as “a cohesive group [of people], usually with an identifiable philosophical approach to their investigations.”<sup>10</sup> I track that philosophical approach through Fechner, who believed that “speculative philosophy could supply a theoretical framework for the hard facts and formulas later discovered by science.”<sup>11</sup> Fusing experimentation and speculation, Fechner practiced psychophysics as what I call a *speculative science*, which made it possible to theorize feeling as a relation between material and mental phenomena.

To call a science “speculative” might seem an oxymoron. After all, speculation typically plays the foil to the practical applications of reason codified by Francis Bacon’s scientific method. I describe psychophysics as a speculative science because it operated at the nexus of two meanings of *speculative*: the abstract and the aspirational. Psychophysical researchers like Fechner saw themselves as redressing the abstract philosophy of mind by using experimental methods to prove the soul’s autonomy and a priori organic unity. As Louis Menand remarks in his cultural history of pragmatism, the “true ambition” of psychophysics was not to “reduce mental phenomena to physical laws, but to solve traditional philosophical problems using laboratory methods.”<sup>12</sup> Here, psychophysics resonates with the “fugitive science” practiced by the many antebellum African Americans who produced alternative knowledges in “the quest for and name of freedom.”<sup>13</sup> Psychophysics was neither institutionally nor politically fugitive, but like fugitive science it used empiricism to ground philosophies of existence in the lived world. And in the process of “physiologizing” speculative traditions—that is, studying the soul through the materiality of the mind—psychophysics landed on another kind of speculation: the idea that sense experience is a contemplative and conjectural activity, or in David Kazanjian’s eloquent language, a “comprehension of the ongoing, dynamic relationship” between self and world unfolding in a subjunctive temporality.<sup>14</sup> Under psychophysics, sense experience is not a stable reflection of the object world but a bodily cognition that anticipates a particular perception

(e.g., the color green) as it is being physically processed. Like other speculative enterprises that used everyday practices to launch more existential reflections—including didactic writing and black settler correspondences—psychophysics offered a theory of feeling as material but not mechanistic, as mundane yet cosmically meaningful.<sup>15</sup> It was a speculative science in both senses of the term, for it fused inductive and deductive logic—answering philosophical questions in the laboratory—while reframing sense experience as a dynamic process of becoming.

A speculative science is a difficult balancing act. Nineteenth-century thinkers tended to view psychophysics either as too speculative or not speculative enough. In *Principles of Psychology* (1890), William James derided psychophysics as the science of “representing sensations by numbers” and lamented the “microscopic psychology that has arisen in Germany,” so intent on defining “the *elements* of mental life” that its “method taxes the patience to the utmost, and could hardly have arisen in a country whose natives could be *bored*. . . . There is little of the grand style of these new prism, pendulum, and chronograph-philosophers. They mean business, not chivalry.”<sup>16</sup> In James’s view, to measure the minutiae of mental life is to sap introspection of its romance, thereby reducing consciousness to something decidedly less than the sum of its vibrant parts. Yet in a later passage rich with dramatic irony, James dismisses Fechner as a “mystic and an experimentalist, . . . as loyal to his facts as to his theories. But it would be terrible if even such a dear old man as this could saddle our Science forever with his patient whimsies.”<sup>17</sup> This criticism is James at his least Jamesian; here he sounds more like one of the New Psychologists trained by Fechner’s colleague Wilhelm Wundt in the 1880s, many of whom (including G. Stanley Hall, E. B. Titchener, and Hugo Münsterberg) inched psychology further away from ontological whimsy and ever closer to positivism. While running James’s psychology laboratory at Harvard, for instance, Münsterberg took to the *Atlantic Monthly* to declare psychophysics a “blunder.”<sup>18</sup> By the turn of the twentieth century, James’s own whimsies began to appear outdated. Perhaps recognizing himself in the mystic-experimentalist, James ended his career revaluing Fechner as a “philosopher in the ‘great’ sense of the term” and heaped praise on his “panpsychic worldview.”<sup>19</sup> Although psychophysics had been discarded as a failed science, James spent his final years insisting on the fruitfulness of its underlying speculations.

When it came to psychophysics, in other words, James had wanted to separate the philosophical wheat from the scientific chaff. But the numbers that James disdained were entirely fundamental to the worldview that he lauded.

These numbers, in fact, were born of an age-old philosophical impasse: the mind-body problem, whether there is a distinction between mind and matter (dualism) or a unifying reality holding them together (monism). Scientific materialism, grounded in the empiricist philosophy that claims must derive from observable phenomena, posited that nature fully explains the world. Conversely, idealism insisted on a transcendent principle (e.g., God, vital force) for explanation. As a medical student in the 1820s, Fechner predictably subscribed to materialism. But then a friend loaned him naturalist Lorenz Oken's *Elements of Physiophilosophy* (1802), which argues that a higher consciousness animates and unifies the world—hence matter and mind are two sides of the same ontological coin. Fechner quickly embraced Oken's monism, which put him at odds with the scientific community. The following decade, while teaching physics at the University of Leipzig, he used the pseudonym Dr. Mises to pen philosophical tracts and satirical rants that lambasted the arrogance of medicine and science. But in these texts Fechner also sketched out what he called the “day view.” Contra the “night view” of a mechanistic world, the day view holds that to study only the material features or only the immaterial features of nature is to overlook the connection of all things. Where the physicist sees life as matter demonstrating certain properties under certain conditions, the philosopher sees it as a complex of emotions and ideas. The day view joins the two perspectives: it affirms that the mind (via the nerves) is explicable by the laws of nature but argues that consciousness is not, while affirming the soul's agency but arguing that this agency arrives immanently in the world. What emerges here is a transcendental materialism. In *Nanna; or, On the Soul Life of Plants* (1848) and *Zend-Avesta* (1851), Fechner used the day view to claim that all organic matter, from rocks and stars to insects and human beings, has a soul and that the universe is a manifold living organism made up of these interlocking soul systems. This notion of interconnected consciousness resonates with transcendentalism—especially Ralph Waldo Emerson's claim of “an occult relation between man and vegetable”—although the New England philosophy subordinates the material to the ideal, whereas the day view sees the two as inherently linked.<sup>20</sup> A way to uphold materialism without abandoning idealism, the day view replaced God and nature with consciousness as a universal ordering principle.

In the decades during which Fechner developed the day view, which is the conceptual foundation of psychophysics, experimental physiologist E. H. Weber (Fechner's adviser and then colleague at the University of Leipzig) laid out the methodological foundation of psychophysics. Credited by Fechner as

the “father of psychophysics,” Weber was the first scientist to examine sensation as a subjective experience and, further, to quantify it by using experimental methods. This research marked a major shift in the science of mind. Weber’s object of analysis was not the sense impression, a unit of feeling routed through the nerves, but rather sense experience, the lived awareness of feeling. To investigate sense experience, he tested out the relation between sensory input and perceptual intensity. In laboratory settings, Weber exposed test subjects (white men) to a physical stimulus (e.g., light), then increased the magnitude in small increments (e.g., watts), and then numerically recorded subjects’ perception (e.g., brightness) of those increases. In one experiment, blindfolded subjects held equally weighted objects in each hand while Weber slowly increased the weight of one object until they perceived a difference between the two. These tests led Weber to postulate a perceptual *threshold*: a quantifiable point that a physical stimulus must cross before the perceiver can detect a change in sensation. The minimum amount of stimulus increase needed to cross the threshold was a unit of measurement that he called the *just-noticeable difference* (JND). The threshold and the JND established an empirical correspondence between mind and matter, inner life and the external world. By experimenting with people’s qualitative experience of physical changes in the environment, Weber reframed consciousness as “the accumulation of minute mental registrations of difference, or small acts of discrimination.”<sup>21</sup> Quantitative analysis of the experiential dimension of sensation—that is, of feeling’s qualities—set the science of psychophysics in motion: the experimental study of feeling from an immanent point of view.

Fechner directly adopted Weber’s experimental design. In 1850, he began pursuing the cosmic goal of resolving the mind-body problem on an impossibly small scale: by quantitatively correlating gradations of physical stimulation to the slight differences in sensation that a person felt. What emerged was the day view science of psychophysics, which Fechner defined in *Elements of Psychophysics* as “an exact theory of the functionally dependent relation of body and soul, or more generally, of the material and the mental.”<sup>22</sup> By paying attention to the individual peculiarities of our perceptions, by discovering personal variations in sense experience, we can approximate the common reality or principle holding body and soul together. Fechner spent the rest of his career assaying the body-soul relation by studying the subjective recognition of the change produced by a stimulus. To do so he established the *sensitive threshold* as the point where a “stimulus or change in stimulus becomes noticeable or disappears.”<sup>23</sup> These tests led Fechner to conclude that the relation

between matter and mind—stimulus and sensation—is not proportional, as Weber had claimed, but logarithmic: “The magnitude of the sensation ( $g$ ) is not proportional to the absolute value of the stimulus ( $b$ ), but rather to the logarithm of the magnitude of the stimulus, when this last is expressed in terms of its threshold value ( $b$ ).”<sup>24</sup> This logarithmic formula means that as a stimulus increases in magnitude, the corresponding sensation intensifies to a lesser degree. For example, as light increases, it becomes more difficult to perceive the change in brightness; we are more conscious of the subjective difference in brightness between a dark room and one lit with a 25-watt bulb than between a room lit with a 100-watt bulb and one with a 125-watt bulb, although the objective difference in light (25 watts) is the same. Known as the *law of psychophysical parallelism*, the equation  $g = k (\log b/b)$  is the cornerstone of psychophysics. It is an empirical expression of the day view: material life and mental life correlate, are “functionally dependent,” but do not directly affect each other. Whereas the night view states that matter determines mental processes, psychophysical parallelism upholds the monistic day view that mind and matter, soul and body, are interrelated but not causally related phenomena.

Using mathematics to answer metaphysical questions might appear an overzealous empiricism. In fact, the refusal to establish a direct link between body and mind pushed Fechner in the opposite direction—toward bold extrapolation. To justify his methods, he allowed that there are “difficulties of measurement in our psychophysical domain, difficulties which do not exist in purely physical or astronomical areas,” but insisted that these “difference[s] only mean that the sphere of inquiry must be widened, and considerations introduced which do not exist in other areas.”<sup>25</sup> Our limited access to consciousness is not a limitation but an invitation to expand what counts as phenomena. We can see why James came around to Fechner—and why Fechner’s biographer Michael Heidelberger describes his subject as “a radical empiricist with a phenomenalist outlook.”<sup>26</sup> In the last decade of his career, while he was praising Fechner’s philosophy, James developed the philosophy of radical empiricism. Whereas the “ordinary empiricism” of Enlightenment thinkers like John Locke and David Hume isolates distinct particles at the expense of seeing larger connections in the world, with radical empiricism experience includes both the particulars and the relations between those particulars: “For such a philosophy, *the relations that connect experiences must themselves be experienced relations, and any kind of relation experienced must be accounted as ‘real’ as anything else in the system.*”<sup>27</sup> The day view can be understood

as an iteration of radical empiricism, a philosophy of science that thickens Fechner's earlier claim that calculating minute variations in sensation does not reduce the world to numbers but rather produces more connections in the world, more interlocking souls. Epitomized by the law of psychophysical parallelism, psychophysics sought to interweave the hard facts of material life with, following James, "the *wild facts*" of mental life.<sup>28</sup> Yoking physiology and philosophy, psychophysics undid ordinary empiricism in the process of practicing it.

Moving from natural philosophy to experimental procedures and an incipient radical empiricism, psychophysics was a speculative science that "combined elements of the vitalism that had been popular in Romantic scientific thought with a commitment to a severely nomothetic approach to science that would appeal to the extreme positivist," writes historian Woodruff D. Smith.<sup>29</sup> This Romantic scientific thought was shed by century's end. When Wundt's *New Psychology* replaced psychophysics, it relegated the body-soul problem to philosophy and kept the experimental study of introspection for itself. In an 1893 essay in *McClure's* on James's psychology laboratory, Herbert Nichols declared the "study of the mind an established natural science, here, at sober universities, and free of spooks and mediums."<sup>30</sup> So rang the death knell of psychophysics. Yet general readers in North America continued to discuss the law of psychophysical parallelism, described in the *New Englander and Yale Review* as "a *metaphysical* theory [that] what we call matter and what we call soul are but sides [of] one and the same reality."<sup>31</sup> Although on the wane in scientific circles, psychophysics remained an appealing framework for meditating on the grand implications of the measured mind. A science that sought to explain the world without explaining it away, it traded the *what* of sensation (impressions) for the *how* of sensation (experience), split feeling into a set of sense-specific experiences, and used quantitative analysis to prove metaphysical hypotheses. As a speculative science, psychophysics studied the interrelation of organic life and soul life to arrive at definitive proof that human consciousness is material yet elastic enough to accommodate the will.

## SENSITIVE SUBJECTS

The psychophysical account of consciousness as equally embodied and ensouled had significant social value. The experimental study of sense experience (taste, touch, sight, sound, and smell) led Fechner to develop the concept of perceptual sensitivity: the psychophysical process of discerning fine



gradations of sensation, such as varying levels of brightness. Once perceptual sensitivity migrated into cultural arenas, it became an affective capacity that moved aslant the dominant discourses of sensibility and sentimentality. These familiar discourses turn on the concept of sentiment, defined as the emotional reflection arising from sense impressions. In the eighteenth century, empiricism joined with social philosophy to form sentimentalism, a moral epistemology that considers sentiment the guide to truth. Sentimentalism underwrote the bourgeois project of sensibility, which made the subject's cultivation of sympathy, or "fellow feeling," necessary for social membership. In the United States, sentimentalism underwrote sentimental literature, a popular if maligned women's genre that features scenes of heightened emotion, but it was more of an ideology—one that put women's "natural" capacity for sentiment in the service of social reform, such as abolitionism. Sentiment has proved an important framework for showing how feeling operates as a regulatory apparatus; scholars such as Lauren Berlant, Kyla Schuller, and Laura Wexler have powerfully revealed sentimentality's collaborations with consumer culture, life science, and imperialism in propping up taxonomies of race, gender, and class.<sup>32</sup> But like any frame, sentiment restricts as much as it focuses our view. What happens to feeling when sensation shears away from sentiment? Psychophysics, spinning sentiment on its axis with metaphysical rather than moral concerns, suggests one possibility: it becomes the embodied locus of affective judgment, lodging the racial body at the core of the "science of sensitive knowing" called aesthetics.<sup>33</sup>

The era's new discourse of perceptual sensitivity was born of the entanglement of psychophysics and evolutionary racial science. At first glance, the two sciences have little in common: psychophysics investigates psychological variations in individual sense experience while evolutionary racial science investigates biological variations in species over time. They were, in fact, complementary. Fechner and Helmholtz considered psychophysics "consistent with Darwin's theory of evolution and a supplement to it," and conversely Darwin cited their psychophysical research in his study of sexual selection, *The Descent of Man* (1871).<sup>34</sup> Over the course of the century, thinkers moved away from viewing the body "as an entity determined by God and toward viewing it as raw material malleable under man's direction," Carolyn Thomas de la Peña points out.<sup>35</sup> In particular, dominant paradigms of evolution held that species change depends on this malleability and self-directed improvement. What determines success, Darwin argued, is an organism's ability to adapt to its environment, its capacity to acquire and transmit slight biological

variations to offspring. The scientific effort to embed human beings in nature heightened the need to determine the mind's place in nature as well. Influenced by Darwin's studies and the earlier work of Jean-Baptiste Lamarck, evolutionary thinkers deemed perceptual sensitivity a mechanism of adaptation. Further, they turned it into an aesthetic project of racial perfection that I call *sensitivity training*.

Before mapping out this regime of perceptual sensitivity, it is worth establishing that the senses have always been a metric of species, and by extension racial, difference. In *De Anima (On the Soul)*, Aristotle divided the perceptual faculty into five senses—meant to correspond to the elements of water, ether, earth, air, and fire—and arranged them based on their proximity to reason. In the following order, the senses of sight, sound, and smell were specific to human consciousness, and the senses of taste and touch to animal consciousness. In the eighteenth century, following naturalist Carl Linnaeus's taxonomic classifications, the Aristotelian sensory hierarchy became an attractive tool for advancing racial taxonomies. It certainly appealed to Lorenz Oken, whose speculative theory of an integrated totality of consciousness had inspired Fechner's day view. Notably, the subtitle of Oken's *Elements of Physiophilosophy* is *The Theory of the Senses, with the Classification of the Animals Based on It*. Oken divided animal life into five classes, then he invented Latin names for each class based on the sense that ostensibly dominated their mental faculty, and finally he ranked these classes accordingly: *Dermatazoa* (invertebrates), ruled by touch; *Glossozoa* (fish), ruled by taste; *Rhinozoa* (reptiles), ruled by smell; *Otozoa* (birds), ruled by sound; and the highest form, *Ophthalmozoa* (mammals), ruled by sight.<sup>36</sup> Oken then applied this schema to human "classes":

1. The Skin-Man is the *Black*, African.
2. The Tongue-Man is the *Brown*, Australian-Malayan.
3. The Nose-Man is the *Red*, American.
4. The Ear-Man is the *Yellow*, Asiatic-Mongolian.
5. The Eye-Man is the *White*, European.<sup>37</sup>

This sensory taxonomy of racial groups combines classical psychology with natural history, the study of organic life through observation. In an era when natural history sponsored the white supremacist projects of settler colonialism and transatlantic slavery, Oken evolutionizes the Aristotelian sensory hierarchy, narrating species progress as sensory progress. The path from sav-



age to civilized, from black to white, leads from touch to sight. Far from pure abstraction or idealism, his philosophy of a monistic world animated and unified by God was steeped in the natural world, powered by the progressive sensory arrangement of animal and racial classes.

When it came to explaining organic life, the transition from natural history (i.e., ethnology, phrenology, etc.) to natural science (astronomy, chemistry, physics, biology, and geology) in the nineteenth century helped push theories of human difference inward. Accordingly, perceptual sensitivity replaced the sense organs as markers of evolutionary development. To be sure, perceptual sensitivity began as a strictly psychophysical concept. Fechner explained in his *Elements of Psychophysics*, “In general, the term *sensitivity* means no more than what is otherwise referred to by the terms *irritability*, *excitability*, or *sensibility*. . . . However, insofar as all sensations depend on inner processes, one could well relate the term sensitivity to its underlying psychophysical process instead of to sensation.”<sup>38</sup> Fechner draws an important distinction between nervous sensitivity and perceptual sensitivity. Nervous sensitivity is a neurophysiological condition, an unregulated state of feeling that arises when a person’s nerves are so receptive to external stimulation that they are overly affected by and susceptible to environmental influence. By contrast, perceptual sensitivity is a psychophysical process: the higher mental function of discerning a change in one’s sensory state as a result of changes in the physical world, that is, of just noticing the differentia of sensory stimulation. What matters here is not how much one feels but the ability to parse whatever it is that one feels. To catch a whiff of perfume is to be affected by and to *analyze* one’s environment. Perceptual sensitivity therefore names the agential capacity to respond to the world by differentiating slight gradations of sensation. These microfeelings, in turn, form the basis of the finer feelings and judgments needed to manage one’s place in the world.

Perceptual sensitivity was formulated as an “immediate psychophysical affect, a shock to the brain,” that operated as a kind of preconscious substrate of aesthetic feeling.<sup>39</sup> Fechner’s later work clarifies this aesthetic function. After establishing a speculative science that “ensouled” empiricism’s night view of reality, Fechner took to enfleshing the speculative abstractions of aesthetics. From 1865 to 1875, he used his law of psychophysical parallelism to examine how art objects affect the mind. By simply renaming the sensitive threshold the aesthetic threshold, Fechner was able to determine the intensity that an artwork (stimulus) must have to produce pleasure or displeasure (mental activity). Establishing the kind of quantitative analysis that would become the

cornerstone of social science, he surveyed visitors at art exhibitions about their sensory responses to color, form, and line and then used the statistical average of these questionnaires to arrive at a bottom-up definition of beauty and pleasure. In his 1876 study *Vorschule der Aesthetik* (*Introduction to Aesthetics*), Fechner called these empirically derived definitions “aesthetics from below,” over and against the Kantian “aesthetics from above” that uses moral ideals to define truth and beauty. In this explicitly artistic context, Fechner framed perceptual sensitivity as a preconscious judgment—or perhaps more precisely as the immanent habitus of reflection—forming the basis of aesthetics.

Fechner’s aesthetics from below laid the groundwork for the transformation of the Aristotelian sensory hierarchy into a sensitivity hierarchy. That transformation involved the co-option of psychophysics by evolutionary thinkers. For them, perceptual sensitivity was a psychologized renovation of sensibility, the eighteenth-century discourse that emphasized a person’s “capacity to bring intellect to bear on sensory data, to distinguish fine gradations of feeling, and to modulate one’s actions accordingly.”<sup>40</sup> With perceptual sensitivity, fine-grained feelings are cultivated for the purpose of species progress, not of *sensus communis*. This refashioning of perceptual sensitivity largely began with Canadian science writer Grant Allen’s *Physiological Aesthetics* (1877). In it, Allen used physiological research to rank each of the senses according to their evolutionary development and corresponding delicacy of feeling (sight and sound were at the top, predictably). Advancing the view of evolution as a progression from simple to complex structures, he argued that aesthetics is the “progressive product of progressing fineness and discrimination in the nerves, education, attention, high and noble emotional constitution, and increasing intellectual faculties.”<sup>41</sup> Complex sensory structures are “for the advantage of the organism” because they “perfectly align its internal processes with the external environment.”<sup>42</sup> The more differentiated the nerve, the finer the feeling, and the finer the feeling, the more adaptable the perceiving body to the changing environment. Hence, perceptual sensitivity facilitates human development by bringing inner life and outer world into a more perfect correspondence. It was now an aesthetic project of cultivation, at the level of each sense, with an evolutionary purpose.

Perceptual sensitivity became a “valued characteristic of civilized cultivation” because it underwrote aesthetic feeling and, by extension, registered the (human) organism’s autonomy.<sup>43</sup> The “feeling of difference between consecutive, or co-existing impressions,” Scottish thinker Alexander Bain wrote in 1865, is evidence that “we are alive, awake, mentally alert, under the dis-

criminative exercise, and accordingly may be said to be conscious.”<sup>44</sup> Awake, alive, alert: perceptual sensitivity allows a person to act with the world rather than react to it. Instead of leading to exhaustion or irritation, it stimulates intellection. On this basis, perceptual sensitivity converged with the Lamarckian theory of impressibility: that an organism’s capacity to be affected over time, to glean sense impressions and transmit acquired sentiments to future generations, drives species change. Kyla Schuller persuasively argues that in this era, sentimental biopower turned impressibility into a vector of racialization; a host of institutions disciplined black and indigenous men, women, and children on the basis that they allegedly had unresponsive nervous systems—were impervious to feeling—and therefore were incapable of self-directed improvement.<sup>45</sup> Like impressibility, perceptual sensitivity was thought to drive human development; aesthetic microjudgments fine-tune an organism’s relation to its world. Perceptual sensitivity and impressibility thus represent the psychophysical and neurophysiological aspects of evolution. Impressibility holds that quantity of feeling (repeated sense impressions) stimulates biological development, and perceptual sensitivity that quality of feeling (varieties of sense experience) stimulates it. In short, what accelerates species adaptation is the capacity to experience not simply more feelings but more *kinds* of feelings. Perceptual sensitivity allows the embodied mind to respond to and parse the physical world at an exceptionally granular level. In this way, evolutionary racial science remade perceptual sensitivity into an affective capacity that blends sensibility’s aesthetic judgments with impressibility’s civilizational prerogatives. Whereas impressibility served the broader sentimental imperative of cultivating the capacity for sympathy, perceptual sensitivity channeled affective microjudgments toward the cultivation of aesthetic experiences. Both these scientific theories of feeling were deployed to racialize subjects and manage “life itself” accordingly.

The incorporation of perceptual sensitivity into evolutionary discourse produced a sensitivity hierarchy of humankind: the ordering of racial groups not by their dominant sense but by their capacity to differentiate sensory states. Darwin’s cousin Francis Galton first proposed the sensitivity hierarchy. After reading *Elements of Psychophysics*, he adopted Fechner’s experimental method to test the perceptual sensitivity of the English population, going so far as to invent a special whistle (a dog whistle) to determine people’s varying aural sensitivity.<sup>46</sup> Galton presented his research in *Inquiries into Human Faculty and Its Development* (1883), a book best known for launching eugenics, the program of biologically improving national subjects by enhancing

the reproductive success of those considered physically and mentally “fit” for civilization. Galton considered perceptual sensitivity germane to “the cultivation of race, or as we might call it, [the] ‘eugenics’ question” because it was evidence of a fully developed, differentiated mind.<sup>47</sup> His sensory experiments revealed that “two persons may be equally able just to hear the same faint sound, and they may equally begin to be pained by the same loud sound, and yet they may differ as to the number of intermediate gradations of sensation. The grades will be less numerous as the organization is of a lower order, and the keenest sensation possible to it will in consequence be less intense.”<sup>48</sup> Linked to biological “order” and “organization,” perceptual sensitivity became a metric of racial difference. After all, one of Galton’s major conclusions was that nervous sensitivity is highest among “women of delicate nerves” while perceptual sensitivity “is highest among the intellectually ablest” and lowest among the “wild races,” because “a delicate power of sense discrimination is an attribute of a high race.”<sup>49</sup> Perceptual sensitivity, or “sense discrimination,” now supported racial taxonomies by extending the eugenic project of perfecting the human into the domain of consciousness.

To the extent that the end goal of evolution was a perfect correspondence between organism and world, “sense discrimination” constituted an innate though educable trait powering human development. One can “*educate* the existing [sensory] faculties,” Allen had explained in *Physiological Aesthetics*, but “not *produce* new ones. In every department the aim of Education should be so to train each individual that he may use to the best advantage of the organism which heredity and circumstances have given to him.”<sup>50</sup> So began a cultural program of training perceptual sensitivity, from the color sense (which Nicholas Gaskill has meticulously documented) to the haptic sense.<sup>51</sup> Italian physician and educator Maria Montessori, for instance, placed tactile sensitivity at the core of her pedagogical program in the hopes of “lay[ing] the groundwork for the subject’s perceptual development throughout life, training that would prove essential for their [children’s] insertion into the emerging industrial workplace.”<sup>52</sup> In 1899, novelist and journalist Theodore Dreiser reported on a similar program for adults. Philadelphia psychologist Elmer Gates had found a way to “separately and rapidly train [the senses] to an acuteness and power of discrimination hitherto unknown,” in the interest of guarding against “false or weak registrations of sensations.”<sup>53</sup> First, a person establishes his threshold for each sense, and “when the least he can distinguish in these separate fields has been accurately measured the real training begins”; this involves “detecting, perceiving, and discriminating this ‘least noticeable difference,’ forty or

fifty times an hour, for an hour daily during two or three days.”<sup>54</sup> It was therefore important to cultivate the sensitivity—the internal, or immanent, faculty of judgment—of each sense, “since the whole intellectual progress of the race depends primarily on this perfect sensory development,” Dreiser added.<sup>55</sup> Sensitivity training drove racial progress while guarding against the “feeble-mindedness” (in the vocabulary of the era) that threatened racial futurity. Indeed, Italian criminologist Cesare Lombroso’s “Sensitivity Test” elucidates the stakes of this training regimen. To ascertain the differential responsiveness of “unfit” individuals, Lombroso sent electric impulses to people’s various body parts (genitals, gums, nipples); the less responsive the person, the less intelligent and more inclined to crime and cruelty. Sensitivity to affective stimuli helped classify whole groups of people—mentally ill people, women, people of color, the newly typed homosexual—as pathologically criminal. Adjunct to eugenics and the carceral state, sensitivity training established a set of affective norms that turned “aesthetics from below” into an apparatus of racial science “from above.”

Psychophysics split feeling into a set of perceptual sensitivities, which in turn tethered aesthetics to evolutionary discourses. Over the course of the century, perceptual sensitivity transformed from a precognitive process of discerning sensory states into the affective capacity to make aesthetic micro-judgments—an immediate calculation about, not a disinterested reflection on, the world. Naming the experiential attunement to different qualities of sensation, it joined impressibility in propelling human development and indexing human difference. But unlike impressibility, perceptual sensitivity did not operate exclusively as an arm of biopower. It also functioned as a kind of “sense method,” defined by Elizabeth Freeman as a bodily cognition that opens up those intimacies that “do not always refer to or result in a stable social form but instead *move*, with and against, dominant timings and time.”<sup>56</sup> Perceptual sensitivity was a small-scale judgment that remade feeling into an embodied yet elementally speculative—open-ended, subjunctive—structure of experience, and therefore capable of reshuffling the biologized social field.

#### REMAKING SENSE

In the mid- to late nineteenth century, the experimental study of sense experience gave way to a theory of feeling as a (logarithmic) relation between self and world. As the law of psychophysical parallelism filtered into evolutionary racial science, thinkers such as Allen, Galton, and Dreiser turned their attention

to the affective discriminations calibrating that relation; they considered perceptual sensitivity an unevenly developed affective capacity that places people along a scale of development from savagery to civilization. Situating psychophysics in the wider biopolitical field confirms what we would expect to find in the nineteenth century: that the senses had a disciplinary function. But the senses also had unexpected effects. Hermann von Helmholtz's sign theory of perception expanded these sense-specific feelings into embodied conventions—and as a result, the senses served not only as metrics of human difference but also as modes of affective encounter, felt on and through bodies that are always more and other than their biological faculties. Psychophysical feeling proceeds first with perceptual sensitivity, an ongoing process of making microjudgments about the world, and then with the mind's synthesis of those microjudgments into a sign for navigating that world. By tethering the sensory to the symbolic, Helmholtz's sign theory of perception reframed the five senses as organic "forms" that organize material life. What emerged from the tension between perceptual sensitivity and the sign theory of perception was *psychophysical aesthesis*: an aesthetic project positing the five senses as "genres of feeling" that stage the internal dramas of structural oppression. Ultimately, this book proposes, racial difference took shape through the sensory genres—touch, taste, sight, sound, and smell—that allow for aesthetic recalibrations of bodies and subjects to each other and within an unsettled (though at times all-too-rigid) social environment.

Weber and Fechner assayed the role of the psyche in assessing slight changes in the world; Helmholtz assayed the role of the psyche in aggregating those slight changes so that perceiving subjects could act in and on the world. Like Fechner, Helmholtz used experimental methods to study sense experience, but unlike Fechner, he directed his research toward epistemological rather than ontological concerns. Helmholtz's sensory experiments aimed to reconcile competing theories of cognition: conceptual or scientific knowledge (*Wissen*) on the one hand and the lived, practical know-how of "sensible intelligibility" (*Kennen*) on the other. Art historian Zeynep Çelik Alexander explains that in the mid-nineteenth century, amid heated scientific debates about whether judgments are based in thought or in sensation, Helmholtz proposed an "alternative epistemic principle based on the body rather than the mind" called *aesthetic induction*.<sup>57</sup> Complementing Fechner's *aesthetics from below*, aesthetic induction names the intellectual content of sensation; it claims that in the act of sensing, knowing is already taking place. Whereas perceptual sensitivity was a discriminative activity that became a disciplinary



apparatus, the sign theory was a mode of aesthetic induction that became a creative act: feeling a relation between self and world that is equal parts calculation and imagination. By framing sense experience as a sign, Helmholtz made it possible for U.S. writers to reconfigure feeling as a sense-specific genre that stabilizes without cementing one's place in the world.

Aesthetic induction added another layer to Fechner's psychophysical law: the relation between mind and matter is not simply logarithmic but semiotic—a sign. Showing how the sign theory of perception gave way to “genres of feeling,” however, first requires establishing how Helmholtz remade sense altogether. After all, since classical antiquity, sense experience had been considered a mirror or carbon copy of the object world. In Aristotle's famous example, a gold signet ring pressed into a block of sealing wax leaves behind the design (form) but not the gold (matter), and so too objects impress sensations on the mind—hence “sense impression.” Drawing on Aristotle, Enlightenment thinkers like Locke developed the “impression theory of sensation,” which posits that the mind is a blank slate and that sense impressions, stamps of reality endowed with preformed meaning, are its only source of knowledge.<sup>58</sup> But as experimentation began replacing observation in the study of mind, where the philosopher had once seen a *tabula rasa*, the physiologist now saw an active organ powered by nerves. In the 1820s, physiologist Johannes Müller (Helmholtz's adviser) discredited the impression theory. He proposed the “law of specific nerve energies,” the theory that through the nerves, the mind receives “knowledge of certain qualities or conditions, not of external bodies, but of the nerves of sense themselves; and these qualities of the nerves of sense are all different, the nerve of each sense having its own peculiar quality.”<sup>59</sup> The law's first implication is that the nerves are not hollow vessels or neutral conduits but “thick” structures that leave their own mark on the messages they convey. In fact, Müller believed that he had found the physiological equivalent of Kant's innate categories of thought, the *a priori* mental concepts that act as intermediates between self and world. Because Müller's law attributed sense experiences to the innate configuration of the nerves, its main provocation was that “our knowledge of the world reflects the structure of our nervous system” rather than the object world.<sup>60</sup> The color green, for instance, is not a property of grass but an effect of the optic nerves. In more nihilistic assessments of this law, what we feel is an arbitrary sign with no stable point of reference. There is no “green”; all reality is subjective.

In addition to overturning the impression theory of sensation, the law of specific nerve energies initiated what Jonathan Crary calls the “separation of

the senses,” the atomization of the feeling body into isolated perceptual functions.<sup>61</sup> For Müller, the senses were organically distinct mediums: five types of nerves, each corresponding to one of the five senses. In claiming the functional autonomy and organic specificity of the senses, Müller posited what might be called a *formalization* of the senses. Reconciling the form/matter distinction set out by Aristotle and advanced by Enlightenment empiricists, Müller’s law suggests that the senses are not impressions of the world but, rather, distinct physiological forms that actively shape it. Through the senses, consciousness leaves its imprint on the world—not, as Locke had claimed, the other way around. The sensory nerves determine what kind of sensation a stimulus will become; an optic nerve transposes electricity into retinal “floaters,” whereas a tactile nerve turns it into heat. The nerves serve as the internal rules of coherence governing the experiential form a stimulus will take: whether electricity will feel bright or feel hot. The five senses were now organic forms—and the seed of *aesthesis*.

A science “born directly out of Müller’s physiology,” psychophysics used lived experience to find a middle ground between sensory physiology (feeling is subjective) and the impression theory of sensation (feeling reflects objective reality).<sup>62</sup> Weber, Fechner, and Helmholtz argued that sense experience is material but not strictly so—it is shaped, but not entirely governed, by nerve structure. They agreed with Müller that everyone sees the color green slightly differently due to variations in physiological makeup. Nonetheless, they contended, by studying the individual peculiarities of sense experience—the psychological component of sensation—we can determine the common quality or reality that unifies these subjective variations. In the 1850s and 1860s, while Fechner pursued this problem by testing people’s perceptual sensitivity, Helmholtz put forth studies of sense experience that shifted the study of feeling away from Müller’s physiological determinism and closer to radical empiricism. In his *Treatise on Physiological Optics* (1867), Helmholtz revealed that the retina is physiologically prone to distortions and gaps in the field of vision but that the mind fills in these lacunae through “unconscious inferences.” A term that covers habit and learned associations, *unconscious inference* is the psychical mechanism that holds inner and outer worlds together. It synthesizes inner know-how with data received from the nerves to construct a coherent picture of the world. Sense experience is neither the projection of an object onto the mind (Locke’s theory) nor a mix of concepts and intuitions (Kant’s theory, which Müller “physiologized”) but an unconscious activity that makes physical stimulation intelligible to the mind. Helmholtz duly



viewed feeling as a product of both nerve structure (matter) and experience (mind)—a physiologically scripted yet psychologically supple configuration.

Helmholtz's notion of unconscious inference remade sense experience into a kind of aesthetic experiment: "The correspondence between the external world and the Perceptions of Sight rests . . . upon the same foundation as all our knowledge of the actual world—on *experience*, and on constant *verification* of its accuracy by experiments which we perform with every movement of our body."<sup>63</sup> Sense experience is not a reflection stripped of embodiment but a learning activity, an "experimental loop of perception, action, [and] consequence"—a central tenet of pragmatism.<sup>64</sup> And what makes it an aesthetic experiment is that, although undertaken for the practical purpose of facilitating the body's successful habitation of the world, its "verifications" are shot through with speculations, with subjunctive formulations about what a particular sensation will become. Echoing Helmholtz in his own way, William Connolly has recently described sense experience as "an anticipatory structure" that organizes the "rapidly changing contexts of everyday life."<sup>65</sup> To perceive green is to anticipate and respond to that color in the process of its own becoming. Feeling falls within the bounds of the physiological parameters of the nerves while remaining psychically provisional at an individual level. Within this conceptual framework, sense experience is a quotidian experiment, an everyday activity, that follows a general pattern or formula (psychophysical parallelism) while remaining open ended and ongoing.

Together, the notion of unconscious inference and experience-as-experiment made it possible to remake sense into a sign. Sense experience is "a *practical* truth," Helmholtz argued. "Our representation of things *cannot* be anything other than symbols, naturally given signs from things, which we have learned to use in order to control our motions and actions. When we have learned to read those signs in the proper manner, we are in a condition to use them to orient our actions such that they achieved their intended effect."<sup>66</sup> Green is a color that everyone sees slightly differently, yet the more we experience green, the more it acquires predictability and stability, which is why most of us agree on its general bounds—that, for instance, green is not orange. Locke would say that green is a mimetic copy of grass imprinted on the mind (i.e., objective reality); Müller would say that it is an effect of the optic nerves (wholly subjective); Helmholtz reconciled the two by saying that although green has no inherent connection to grass, it becomes objectively real the more it is subjectively experienced. Here the sign theory joins the law of psychophysical parallelism in offering a theory of sensation as relational,

insofar as the “distinction between physical and mental, inner and outer—a distinction that is always fallible and revisable—can only be made by interacting with other people. What is inside or outside is *defined socially*.”<sup>67</sup> If relations are real and feeling is relational, goes the day view syllogism, then feelings are real things in the world. Once remade into a sign, sense experience becomes an ongoing act of interpretation—not a “hard” fact but a situational fact that orchestrates without overdetermining new connections between self and world.

Helmholtz’s innovation was to claim that sense experience is real not despite but because of its mediating function; now that signs are a “practical truth,” the symbolic is woven into the very fabric of lived experience. Crucially, then, the conceptual arc that leads from Müller’s separation of the senses to Helmholtz’s sign theory of perception—from the five senses as organic forms to the five senses as psychophysical signs—sets psychophysics along a critical trajectory that moves from Raymond Williams’s “structures of feeling” to Lauren Berlant’s redefinition of genre as a social convention. At base, “structure of feeling” refers to the “affective elements of consciousness and relationships” viewed as social phenomena—the emotions that shape individual, collective, and political life in a specific time and place.<sup>68</sup> Berlant’s illuminating work on the “historical sensorium” (the affects, moods, and atmospheres that negotiate the present in any historical moment) expands these structures of feeling into genres. More than a mode of recognition between reader and literary text, genre names “a sign for shared worldmaking.”<sup>69</sup> As Berlant describes it,

A genre is an aesthetic structure of affective expectation, an institution or formation that absorbs all kinds of small variations or modifications while promising that the person transacting with it will experience the pleasure of encountering what they expected. . . . It mediates what is singular, in the details, and general about the subject. It is a form of aesthetic expectation with porous boundaries allowing complex audience identifications. . . . To call an identity like a sexual identity a genre is to think about it as something repeated, detailed, and stretched while retaining its intelligibility, its capacity to remain readable or audible across the field of all its variations.<sup>70</sup>

With its insistence on small variations and porous boundaries, Berlant’s description of genre is indebted to a psychophysical logic. Yet she pushes that logic further into the social domain of the “conventionalized symbolic.”<sup>71</sup> Genre is a form of recognition, a set of attachments and identifications pro-

cessed in the prerational domain of experience that makes historical moments legible to us. Once genre dilates to include not only literary norms but also social norms, it becomes a “bundle of promises” that bridges the “cultural feelings [that] find their place in how you find yourself.”<sup>72</sup> To say that we live genre is to challenge facile distinctions between representation and reality, and to recognize the structural proximities that make us intelligible (or not) to one another.

Helmholtz’s sign theory of perception is the hinge upon which empiricist theories of sensation (from mimetic imprint to material form to psychophysical sign) and critical theories of feeling (from sign to structure to genre) pivot. It therefore clarifies how the senses came to mediate—not simply mirror—raced, gendered, and disabled embodiment in the postbellum period. In effect, psychophysics turned sense experience into *aesthesis*: the affective locus where embodied immediacy and aesthetic imagining commingle. Within the logic of Fechner’s “aesthetics from below” and Helmholtz’s “aesthetic induction,” the embodied is inherently aesthetic, the lived inherently literary. Accordingly, the perceptual sensitivities that buttressed human difference were also *genres of feeling* structuring the felt experience of that differentiation. The “historical sensorium” of the postbellum period comprised sensory genres for adjusting, at the finest gradation of feeling, relations among body-subjects. The five senses proffered narrative possibilities that organized emotional expectations and social interactions but more specifically, in Amber Musser’s locution, made “the embodiment of difference” central to the “structural aspect of sensation.”<sup>73</sup> By excavating the scientific contexts in which feeling became a “structure,” we can better recognize the conceptual work of the senses and their stakes—organizing the body’s fitful relation to the social world while remaining open to spheres of multiplicity that biopolitical governance cannot fully control.

#### PSYCHOPHYSICAL AESTHESIS

The psychophysics of feeling—involving a set of sense-specific experiences that bridge mind and matter, the affective substrate of aesthetic judgment, and perceptual signs holding self and world together—elucidates the process by which sense experience acquired ontological value in the late nineteenth century. As a speculative science, psychophysics made possible a new understanding of consciousness as embodied but not strictly biological. Psychophysical aesthesis constellated around this new development and experimented further with the existential, aesthetic, and social possibilities thereof.

This project attunes us, I contend, to the status of the five senses as genres of feeling that structure the ontological possibilities and pitfalls of becoming a particular historical body-subject—and that occasion further meditations on the perceptual habits and sensory ways of being that might be cultivated to instantiate alternative selves or social collectivities.

Indeed, this dramatic transformation in the conception of feeling directs us toward the new apprehension in the late nineteenth century of race as a “matter” of consciousness. As periodicals like *Littell’s Living Age* reported that “a number of physiologists, chiefly German, have occupied themselves with measuring the sensibilities of our organism,” these psychophysical measurements and metaphysical theories equipped creative and critical thinkers with the means to unloose the tightening hold of biology on human difference and, by extension, the dominant social order.<sup>74</sup> Thus was born psychophysical aesthesis: the project that extended “aesthetics from below” and “aesthetic induction” into a formally aesthetic domain (e.g., literature, perfumery, photography) to explore the genres of feeling that mediate biologized social arrangements. From 1860 to 1910, a range of U.S. writers explored human difference as a (logarithmic) relation between body and soul, as a mode of feeling that moves through the biological materials of blood and nerves yet is irreducible to them. They exploited rather than shied away from the irresolvable tension inhering in psychophysics, between sensitivity discourse and sensory genres. Even as perceptual sensitivity entered into biological paradigms of the human, psychophysical aesthesis sought to remake race, gender, and disability as processes or activities of embodied consciousness—as a “functionally dependent” though not deterministic “relation of body and soul,” as Fechner would say. Organized around the psychical or experiential remainder of bodily difference, psychophysical aesthesis advanced the proposition that being a problem can be a feeling.

In its exploration of what feeling makes in the world, psychophysical aesthesis did not simply draw on psychophysics but actively advanced and even amended it. *Sensory Experiments* joins recent scholarship that explores the flexibility of literature as a mode of scientific inquiry, from Amanda Jo Goldstein’s delineation of Romantic poetry as a “sweet science” for investigating organic life and Natalia Cecire’s account of the epistemic virtues performed by twentieth-century experimental poetry to Britt Rusert’s and Kyla Schuller’s important recoveries of minoritized science practitioners in the nineteenth-century United States.<sup>75</sup> In keeping with the important work of these and other scholars, this book illuminates the professional science of Weber, Fechner, and

Helmholtz but gives equal if not more weight to the little-known public thinkers who disseminated psychophysical concepts and methods in magazines like *Harper's Monthly*, *Popular Science Monthly*, and *Lippincott's*: critics Henry T. Finck and Grant Allen, German émigrés and physicians Julius Bernstein and Ernst Gryzanowski (a friend of William James and historian Henry Adams), and early psychologists Joseph Jastrow and Havelock Ellis (best known for his work in sexology). Reading psychophysics at once through and beyond its main practitioners illuminates unfamiliar stories about familiar figures: nerve specialist S. Weir Mitchell features not as the inventor of the notorious “rest cure” for bourgeois women but as a beleaguered surgeon who had to use fiction to establish the phantom limb as a fact, while novelist Pauline Hopkins is more of an acoustician testing out the relevance of consciousness to kinship. At the same time, this book recognizes the alternate spaces in which many Americans investigated the experiential bounds of social discipline: the lady's toilette and the kitchen, not simply the university laboratory, are sites of sensory experimentation. In charting the cultural circuits through which psychophysics moved in the late nineteenth and early twentieth centuries, *Sensory Experiments* uncovers the psychophysical experiments—both scientific and literary—that moved sense experience into aesthesis.

Psychophysical aesthesis extended rather than served as a mere venue for scientific concepts. Precisely because psychophysics remade the senses into both a lived experience and a symbolic event—a learning activity shot through with imaginative signification—literature became an important medium for elaborating the aesthetic processes inhering in sensory embodiment. The texts advancing psychophysical aesthesis traverse the literary genres that emerged, were consolidated, or were recalibrated in the postbellum period. What distinguishes psychophysical aesthesis from other literary projects in this era is the purposeful deployment of psychophysics—in the language of parallelism, just-noticeable differences, and thresholds—to stage the internal drama of racialized difference, to reroute social arrangements through the diffuse entanglements of inner and outer worlds. Favoring barely conscious transactions over clearly defined events, psychophysical aesthesis attends to the slight sensory changes that acquire significant social meanings, the fleeting sensations that become scenes of negotiation among those seeking to stabilize their place in an unsettling world. This preoccupation with the small affects mediating the biopolitical management of life takes a particular thematic shape: impossible forms of embodiment, either bodies on the verge of becoming spirits or spirits (consciousness) excessive in their corporeality.

*Sensory Experiments* features body images that are more real than bodies; utopian sounds that imbue “pure being” with racial purity; decadent perfumes that turn women’s biological essence into a chemical essence; dessert recipes that en flesh the domestic angel; and fingers that tell a queerly doubled life story. Psychophysical aesthesis put the logarithmic push and pull of the body-soul relation in direct contact with the emotional ups and downs of the everyday. As a result, the feeling body became a physiologically formal yet psychologically flexible assemblage. And by expanding on the literariness of sensation itself—*aesthesis*, genres of feeling—psychophysical aesthesis remade literature as such into a flexible kind of body, capable of using its own capacious materiality to amend the narratives of social life that it invokes.

Taking a cue from its object of study, *Sensory Experiments* examines literature and sensation in the same way that psychophysics studied mind and matter: as correlated but not causally related. My method is to track scenes in which human difference becomes a problem of consciousness across texts that stage the interrelation of literary genre and lived genre—neither reducible to the other but each transducing the energy of the other. This approach is indebted to the theoretical traditions that attend to the entanglement of experience and language, troubling the entrenched binary of immediacy and mediation. Bruno Latour’s sociological study of olfactory sensitivity in the French perfume industry elucidates this book’s methodology. In “How to Talk about the Body?” Latour analyzes the “olfactory training” that perfume apprentices must undergo, which involves using an odor kit—a sample of fragrances—that “is not part of the body as traditionally defined, [but] it certainly is part of the body understood as ‘training to be affected.’”<sup>76</sup> The odor kit sensitizes the perceiver by equipping her with language, for at the end of the training session, “the word ‘violet’ carries at last the fragrance of the violet and all of its chemical undertones. Through the materiality of the language tools, words finally carry worlds. What we say, feel and act is geared on differences registered in the world.”<sup>77</sup> *Violet* is a descriptor and a performative, realizing an experience that had not consciously existed before. As Nicholas Gaskill, thinking with Latour, writes, “language has the power to augment the sensory encounter with the world.”<sup>78</sup> Psychophysics offers an early iteration of this theoretical position. It bypassed the facile opposition of concrete sensations and abstract signs, instead reconciling empiricist and speculative, scientific and aesthetic ways of knowing. Psychophysical aesthesis extends this proposition by demonstrating that literature is a sensitizing mechanism, not merely a representation but an amplification of experience. Thus, to explore



the proximities of lived and literary genres is to posit literature as a technology or “kit” that has the potential to reproduce—not copy but produce *more*—feeling and, in the key of radical empiricism, to create more connections to the world by registering more differences in it.

Collating various writers and artists who refused the bifurcation of language and life (including Kate Chopin, Emily Dickinson, Sadakichi Hartmann, and Pauline Hopkins as well as William Dean Howells, who appears throughout in small increments), psychophysical aesthesis marks a decisive effort to return aesthetics to its origins in bodily sensation, to aesthesis. It is a project that reaches back to classical antiquity, which according to Daniel Heller-Roazen recognized that “each individual sense (vision, smell, etc.) is its own *aesthesis*.”<sup>79</sup> For the writers under discussion, sensation is not the corporeal springboard for reaching the heights of transcendent feeling; instead those finer feelings dwell within the body. In many ways, the “aesthetic turn” of the past twenty years is in fact a return to aesthesis, a return to the sensory body, and a recognition of aesthetics “as a form of cognition, achieved through taste, touch, hearing, smell—the whole corporeal sensorium,” in the words of Susan Buck-Morss.<sup>80</sup> *Sensory Experiments* is indebted to the New World contexts of aesthetics that Elizabeth Maddock Dillon has excavated, particularly eighteenth-century “Atlantic aesthesis”: the material circuits that linked Native and European populations and that constituted a “commoning” rooted in sense experience, contra the Kantian *sensus communis* delivered from above.<sup>81</sup> Conceptually dovetailing with “Atlantic aesthesis,” psychophysical aesthesis continues the important work of recovering the flesh at the center of aesthetics—and more broadly, the interanimation of aesthetics and biopower. But its aim is less to recover a “commons” of taste than to chronicle the translation of sense experience into a set of conventions that holds a world in common. This book duly views psychophysical aesthesis as a world-making activity, a historically specific project that encompassed the lived realities and lofty reveries drawing disparate individuals into relation.

Partaking of the current recrudescence of aesthetics and of posthumanist perspectives on affect, *Sensory Experiments* builds on important accounts of the sensory body in the long nineteenth century, from the “politics of anxiety” in the antebellum United States to the “transatlantic feelings” sparked by the Paris Commune and the ecstatic religious performances that realized racial difference.<sup>82</sup> Its aim is to uncover the story of how the senses became at once sites of bodily discipline and aesthetic structures organizing the experience of that discipline. It focuses primarily on white-authored and black-authored texts

to elucidate the social problems and contradictions with which psychophysical aesthesis grappled. Of course, “being a problem,” to return to Du Bois, was by no means limited to African Americans in the postbellum period; the general public viewed Native Americans, people with physical and cognitive disabilities, Asian and non-Protestant European immigrants, among others, as “problem” populations. And, of course, race is a highly mobile configuration, a complex mode of arranging power that is consistent neither in its operations nor in its effects. Yet what is consistent, as many critics have demonstrated, is that in the United States, blackness functions as the most inferior racial position, and it governs all other distinctions. In Europe and North America, white supremacy uses blackness as the yardstick against which a person’s distance from whiteness is measured. Lorenz Oken’s sensory hierarchy of racial development—the European “Eye-Man” at the top and the African “Skin-Man” at the bottom—bears out this historical truth. Although psychophysical aesthesis includes the work of those writing from various and variously entangled subject positions, and although there are limitations to focusing on the black/white racial dyad, the goal of this book is to elaborate the genres of feeling that mediated the inner experience of moving along a racial spectrum anchored at opposite ends by blackness and whiteness.

At the same time, *Sensory Experiments* emphasizes that the forms of “complex embodiment” traveling under the sign of disability move in and out of racial hierarchies.<sup>83</sup> As David T. Mitchell and Sharon Snyder have argued, the late nineteenth century witnessed the rise of the “eugenic Atlantic,” the deployment of biological inferiority to constitute race and disability as mutual projects of human exclusion. This book is indebted to recent scholarship that investigates disability as an entry point into, and a central modality of, racialized experiences. Jasbir Puar’s analysis of neoliberal biopower, for instance, reveals how groups are marked “as those in decay” based on “what capacities they can and cannot regenerate,” such that whiteness signifies as “the capacity for capacity.”<sup>84</sup> As an affective-aesthetic capacity, perceptual sensitivity differentially binds disability to race, class, and gender. Although the phantom limb, as chapter 1 shows, is a feeling that seems to diminish the amputee soldier’s claim to whiteness, it confers his “liveliness” over and against the “injured” population of ex-slaves. Yet it is equally true that disability studies scholarship, with its focus on “the materiality of impairment,” clarifies the centrality of complex embodiment to this book.<sup>85</sup> Recognizing the “interbodily potentials, desires, and moments” that structure disabled life, following Melanie Yergeau, means recognizing the aim of psychophysical aesthesis: to under-



stand what bodies can make in and of the world, to speak bodily variation from the inside (no matter how porous “inside” is), and to model life on interdependence rather than independence.<sup>86</sup> Helen Keller’s *The Story of My Life* at first appears a conventional narrative of “overcoming” disability, as I discuss in chapter 5, but in fact it exploits tactile sensitivity to transform autobiography into a genre of selves. Keller is therefore a germinal seed in contemporary critical efforts to reconcile the social construction of disability with the lived experience thereof. The cultural collocations of difference in the postbellum United States reveal that experiences of disability not only intersected with racialized experiences but also activated psychophysical aesthesis, which assesses not what feeling is but what it can do.

#### OVERVIEW: SENSITIVITY AND SYNAESTHETICS

In five chapters, each devoted to a specific sense, *Sensory Experiments* tells the story of how racial difference became a sensory experience. As such, it tracks the material circuits of sensory activity as they structure an impossible desire for social attachments that simultaneously transcend the body and secure its biological particularity. Beginning with the seemingly immaterial sense of sight, chapter 1 uncovers the immediate precursor to and impetus for the concept of the “body image”: the phantom limb, which revealed the existence of a psychological body that animates the physical one, and as such provoked a crisis of seeing that inflected the national crisis of the Civil War. Within the context of Fechner’s theory of “heavenly vision,” S. Weir Mitchell’s identification of the phantom limb in amputee soldiers and William Mumler’s spirit photographs constituted distinct “body images” that turned sight into a sense of its own loss. This mode of “not-seeing” dilated the real, and realism itself, to include the occult—though in so doing depicted “spirited” white bodies as particularly capable of feeling loss. Chapter 2 also pursues the problem of what happens to bodies that become spirits by pursuing the relation between psychophysical acoustics and post-Reconstruction utopian fiction. Edward Bellamy and Pauline Hopkins both leverage in their novels Helmholtz’s resonant theory of hearing as a vehicle of transpersonal consciousness, the ontological basis of alternate worlds of “pure being” that can nonetheless certify racial purity. Uncovering the tension between acoustics and eugenics, the chapter focuses on shared efforts in *Looking Backward, 2000–1887* and *Of One Blood* to fold auditory sensitivity into narratives of evolutionary development while retaining the egalitarian possibilities of social harmony.

The book then moves from the theories that emerged from psychophysics proper to the psychophysical ideas further developed by perfumers, cooks, and activists. Chapter 3 excavates the chemical and racial science behind synthetic perfumery to consider the intoxicating pleasures—of queer intimacy and cross-racial desire—that can easily shade into toxic peril. A compound that mixes organic and inorganic materials, synthetic perfume unsettled social boundaries at the level of the free-floating odors that diffuse rather than contain sexual and racial difference. Yet in the naturalist fictions of Kate Chopin, these perfumes paradoxically mediate the “stuckness” of the New Woman, for whom free-floating embodiment is more perilous than pleasing. Moving from an atmospheric aesthetics to a mode of apparent self-containment, chapter 4 excavates the racial bodies underwriting the new status of taste as the “soul” of food. In the tension between culinary science and gastronomy, sweetness became the most transcendent component of eating—and the most primitive. Women, the main cooks in the house, used their sweet tooth to experiment with this paradox. A comparative analysis of several Afro-Caribbean black cake recipes, followed by analysis of Emily Dickinson’s culinary and poetic engagement with Domingo, shows how women cooks rendered gustatory and aesthetic delicacy a carnal mode of consciousness. Where taste reveals the fleshiness at the inner core of finer feeling, touch in chapter 5 poses questions about consciousness rendered only by external contact. An object of psychophysical study and herself a psychophysical practitioner, Helen Keller authored autobiographies that turned touch into a “double sensation” of self-as-other. Analyzing *The Story of My Life* as a story of many selves and then in conjunction with W. E. B. Du Bois’s collective autobiography, *The Souls of Black Folk*, elucidates the touches that reorganize selfhood into a third-person narrative.

I offer “thick descriptions” of each sense as it was steeped in specific scientific claims, political discourses, and cultural practices. My method is indebted to the field of sensory studies, especially historian Mark M. Smith’s work on the senses and race in the nineteenth century.<sup>87</sup> Most monographs within this important field are organized around a single sense, to offer historical depth. However unwittingly, this strategy implicitly reifies the singularity of a given sense by effacing its connections with other experiential modalities. Furthermore, it risks reproducing the Aristotelian hierarchy—the Western canon of taste, touch, sight, sound, and smell—that has been used to buttress racial and species taxonomies. As the interdisciplinary formation first of visual studies and then of sound studies in the past twenty years suggests, scholars continue to value as worthy objects of study only those senses that sit atop hierarchies of intellec-

tion (Aristotle's human/animal distinction), of race (Lorenz Oken's taxonomy from the white eye-man to the black skin-man), and of aesthetics (Grant Allen's taxonomy from sight to taste). The fact that the senses of taste, touch, and smell have yet to be organized into coherent subfields (although taste does at times fly under the banner of food studies) suggests that humanist inquiry has not yet divested itself of the imperialist, anthropocentric frameworks that subordinate the "corporeal" senses to the "noncontact" ones. By allocating equal epistemological and aesthetic value to each of the five senses, *Sensory Experiments* aims to level vertical schemas of sensory feeling and, in turn, draw cultural studies into conversation with the racist logics of its own field formations.

With each chapter devoted to a single sense, this book may level the sensory hierarchy, but it still retains the Western fiction of a "five-sense sensorium," to borrow Marshall McLuhan's term.<sup>88</sup> Psychophysics certified that fiction by studying consciousness as a set of sense-specific capacities. It also offered a fruitful means for undoing these distinctions: synaesthesia. Defined by neuroscientist Richard Cytowic as the "capacity for [the] anomalous binding" of otherwise distinct sensations (e.g., a yellow smell), synaesthesia covers a range of experiences involving the commingling of sensations.<sup>89</sup> History is replete with isolated reports and individual case studies of synaesthesia, but Fechner was the first to systematically study it as part of his "aesthetics from below." Of the hundreds of museumgoers he surveyed, seventy-three associated specific colors with specific figures. Francis Galton—commonly credited with "discovering" synaesthesia, likely because Fechner's *Vorschule der Aesthetik* has yet to be translated into English—later used Fechner's questionnaires to study the same phenomenon. In *Inquiries into Human Faculty and Its Development* he discussed the evolutionary merits of perceptual sensitivity as well as the peculiarities of "color associations" and "visualized numerals." Perceptual sensitivity produced its doppelgänger: the sensory experiences that do not yield emotional distinctions but instead forge likeness and unity.

Fin de siècle symbolists and like-minded artists embraced synaesthesia as a mystical gift and a means of access to occult knowledge, while social critics viewed it as a symptom of degeneracy. Galton pointed out that synaesthesia is an anomaly and a heritable trait but did not consider it an index of biological inferiority. Yet given its place in *Inquiries*, synaesthesia is necessarily bound to eugenics. In the 1880s, it filtered into social Darwinist narratives of white racial decline. If evolution is a process of an organism's physical and psychological differentiation, then synaesthesia is a measure of primitive simplicity, an embodied mind unable to calibrate its relation to the world

and adapt accordingly. This was the argument that Austrian physician Max Nordau made in his indictment of European decadence, *Degeneration* (1892). Nordau drew on the work of pharmacologist Raphaël Dubois, whose study of bioluminescence revealed that the paddock (the ancestral mollusk) hears, feels, tastes, and smells all at once. Nordau claimed that synaesthetic experience “relinquishes the advantages of the differentiated perceptions of phenomena, and carelessly confounds the reports conveyed by the particular senses. It is a retrogression to the very beginning of organic development. It is a descent from the height of human perfection to the low level of the mollusk . . . and the return from the consciousness of man to that of an oyster.”<sup>90</sup> Perceptual sensitivity was an affective capacity driving evolution and art. Conversely, synaesthesia was an anomaly that pitched human beings backward in time, past the primates and reptiles to the bivalves. Contra the racial project of perceptual sensitivity, it threatened the progressive arc of aesthetic and social order.

The scientific history of synaesthesia reveals the dialectic of distinction and dissolution that animates the project of psychophysical aesthesis—and this book. Perceptual sensitivity upholds a classificatory logic, whereas synaesthesia runs the risk of aesthetic formlessness. *Sensory Experiments* embraces this risk. It attends to synaesthesia as a “fugitive interval,” to borrow from William Connolly, between the “reception of sensory experience” and the cultural “organization of perception.”<sup>91</sup> Interrupting perceptual order and this book’s organization are four fugitive intervals that excavate the era’s synaesthetic experiments: the invention of color music paradoxically doubles as sensitivity training; smell concerts bind acoustics to perfume’s Orientalist aesthetics; a fictive “yellow smell” renders bourgeois bodies indistinguishable from primitive ones; and a contemporary Sugar Baby solicits the “mouthfeel” of enslavement by conjuring an antebellum salt lick. Thus, in the process of bridging sense-specific genres of feeling, synaesthesia becomes this book’s *disorganizing* principle, an internal disruption of its organizing logic. This arrangement aims not to rehearse the contrapuntal movement of regulation (perceptual sensitivity) and resistance (synaesthesia) but instead to emphasize the interpenetration of these two new varieties of sensory experience in the always-tenuous processes of subjectification. In the structural oscillation between sensitive chapters and synaesthetic intervals, between genres of feeling and the anomalous bindings they generate, *Sensory Experiments* crosses the very thresholds it studies. Only then might we enter into the story of how “being a problem” became a matter of consciousness, of how subjective feeling became an objective fact.