Beans Velocci

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for every trans person who is sick of reading the news

I offer you this warning: the Nature you bedevil me with is a lie. Do not trust it to protect you from what I represent, for it is a fabrication that cloaks the groundlessness of the privilege you seek to maintain for yourself at my expense. You are as constructed as me; the same anarchic womb has birthed us both. I call upon you to investigate your nature as I have been compelled to confront mine. I challenge you to risk abjection and flourish as well as have I. Heed my words, and you may well discover the seams and sutures in yourself.
—SUSAN STRYKER, "My Words to Victor Frankenstein Above the Village of Chamounix: Performing Transgender Rage" (1994)

There is no such biological entity as sex.
—FRANK LILLIE, introduction to *Sex and Internal Secretions* (1939)

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A Note on Notes

This book contains both footnotes and endnotes. You'll find immediately relevant commentary at the bottom of the page, indicated by Roman numerals. The endnotes, indicated by Arabic numerals, contain suggestions for further reading of the "see also" variety, basic citations, and occasional notes that, despite their discursive nature, wound up at the back of the book because they mixed several of the above elements and made everything look too cluttered. It is only fitting that a book about a system that remains in use despite constant exceptions would employ just that kind of system for its notes.

Acknowledgments

Writing this book was hard. Writing any book is hard, I think, but I wrote this one in the midst of an ever-worsening surge of anti-transness (see also climate change, fascism, genocide, pandemic, police violence, among others) and there were days and weeks and sometimes even months when the thought of confronting the source material and the manuscript was somewhere between nausea-inducing and impossible. I would not have been able to do it alone.

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Introduction

A Trans History of Classification

After nearly two decades of effort to understand and clinically manage transsexuality, Harry Benjamin opened his 1966 book *The Transsexual Phenomenon* with a reflection on the continued mystery of sex.[i] "There is hardly a word in the English language comparable to the word 'sex' in its vagueness and in its emotional content," he began the first chapter, titled "The Symphony of Sexes." The symphony, alas, was rather discordant. "It seems definite (male or female) and yet it is indefinite (as we will see)," Benjamin continued. "The more sex is studied in its nature and implications, the more it loses an exact scientific meaning."[1]

Benjamin was, as will become clear by the end of this book, wrong about a lot of things. He was a consummate medical gatekeeper, disgusted and annoyed by his trans patients, and he and his collaborators laid the groundwork for medical approaches that still make life harder for trans people more than fifty years later. For one shining moment, though, Benjamin got something right. He was fighting to make sense of sex in the wake of a century of scientific thought and practice that had produced multiple incoherent versions of it: sometimes a binary of male and female, sometimes a more expansive array; sometimes flexible, sometimes immovably

i A discussion of what I mean by *sex* will follow. For now, think of something expansive.

static; defined by anatomy, by gametes, by gonads, by chromosomes.[ii] Benjamin could see the failure of science to develop a robust explanation of sex in the transsexual bodies before his eyes. To attempt to classify the sex of his patients who had modified their genitals and endocrine profile, who lived in the world as women even though legal documents insisted they were men, whose distribution of body hair or breast development was not what was expected for their karyotype, Benjamin had to contend with a system of sorting that presumed all of these traits went together, even as scientific knowledge increasingly demonstrated that they didn't. Benjamin would puzzle through this conundrum in the context of transsexuality, but transsexuals weren't the only people for whom sex consisted of multiple, often conflicting parts. He was ensnared in not just a transsexual phenomenon but a fundamental condition of sex science.

This book historicizes the mess of sex and how that mess was and remains central to the tenacity of sex as a classification system. Between the mid-nineteenth and mid-twentieth centuries, American researchers failed to get sex categories to cohere, and sex nonetheless continued to serve as the bedrock of both social arrangements and theories of life itself. The incoherence of sex—its multiple, coexisting, conflicting meanings—made it infinitely flexible in the face of evidence that the living world cannot be split so easily into male and female categories.[2] Scientists peered at and into the bodies of all kinds of organisms and, with their specialized powers of observation, made determinations about what was male and what was female with escalating specificity. New fields and institutions of study organized themselves into existence, and they accrued funding and institutional stature to match their increasing importance.[3] Scientists and clinicians alike staked their own claims to expertise on the rarified knowledges and techniques they possessed, which granted them insight into what they valued as one of the driving forces of life.[iii] Sexuality and its accompanying taxonomies—heterosexual, homosexual, invert, nymphomaniac, fetishist, fairy—became a defining feature of the self.[4]

ii Throughout, I use *binary* and *male and female* roughly interchangeably. A discussion of *binary* as a useful analytic but ahistorical term appears later in this introduction.

iii By the construction of expertise, I don't mean some kind of nefarious campaign. Rather, all science requires negotiation around what facts will be true, and which field or discipline will be the privileged site for knowing things about a given topic. See Shapin and Schaffer, *Leviathan*; Gieryn, "Boundary-Work"; Latour, "Give Me a Laboratory"; and Longino, *Science as Social Knowledge*.

This outward crystallization of categories and precision of definitions of sex, however, belies the persistent incoherence that scientists confronted and created in their efforts to stabilize the meanings of male, female, and sex itself. As scientists poked, prodded, and gazed, they encountered a vast quantity of evidence that did not show an obvious or stable division between male and female bodies, or a singular thing called sex at all. Exceptions and anomalies piled up, conflicting accounts of how sex functioned and what it was filled the leading journals, and researchers deployed wildly different definitions and practices for their investigations of sex. These contradictions did not undermine the idea that sex was knowable or the primacy of science as a way to know it. On the contrary, this book argues, the incoherent multiplicity of sex was a feature, not a bug. It was both opportunity and release valve, a means of ensuring near limitless claims to scientific innovation and a built-in dexterity that could cope with the range of its own otherwise threatening discoveries.

This book follows an interconnected cast of researchers across five sites that make the management of sexual incoherence particularly visible. It examines how zoologists navigated their encounters with animals that did not neatly fit into male and female categories even as they used the so-called natural world as fodder to theorize human racial hierarchy; how eugenic scientists simultaneously harnessed the malleability of sex while organizing their research according to a static binary; how a gynecologist's theory of sex as a matter of degree, not kind, clashed with his reluctance to deem any of his patients not women; how the statistical Kinsey studies calcified binary sex as a variable with which to understand the diversity of sexual behavior; and how the early years of American trans medicine's straightforward definition of the transsexual crashed into the anxiety of medical doctors convinced they might allow the wrong people to transition. In these spaces, sex amassed its power to sort bodies not from fixed, agreed-upon parameters, but from a tacit agreement that it could be multiple, often contradictory things at once. Sex has worked as a way of socially ordering the world with the cultural weight of science behind it because researchers could and did reclassify bodies, redefine categorical criteria, and reconstitute what they considered sex. As a result, unruly bodies could be recaptured back into normative male and female categories, with no need to question a binary sex system, the right of science to serve as a privileged site of sexual knowledge, or a racial hierarchy defined in part by sexual difference. Sex, it turns out, has very little to do with bodies. It's about the categories and who controls them.

Ripping the Seams and Sutures

This is a work of trans history.[iv] It interrogates the assumption that most people happen to fit into the binary sex categories they were assigned at birth, in contrast to a trans minority that does not. While one of its chapters does focus on trans medicine specifically, the forms of troublesome sex that are the book's primary target are neither referred to by historical actors as transgender (or transsexual or transvestites or inverts, or any of the many other historical terms for people whose sense of self or social role does not match their assigned sex) nor recognizable as related to contemporary definitions of transness.[5] I focus instead on human and nonhuman subjects whose bodily deviance was ultimately drawn back *into* normative categories rather than excluded from them. Doing so shows the tremendous amount of work that has gone into making it appear that "non-trans" forms of sex and gender are not just as constructed as trans ones. I aim to make that work visible and demonstrate that even if you don't think trans history is relevant to your work on gender, sex, or sexuality, it almost certainly is.[v]

Trans people and the concept of transness as a whole have, until quite recently, largely been left out of historical narratives.[vi] More urgently, contemporary denials of trans legitimacy and attempts to eject us out of

iv This section is adapted from Velocci, "Denaturing Cisness."

v My hope is this book will reach a range of audiences, including some who are well versed in science and technology studies (STS) or history of science but not trans studies, and vice versa. This section and the next go into the detail and context they do to provide an overview of the relevant historiographical issues from each of these fields and some conceptual and methodological translation.

vi Trans people, of course, have been thinking about trans history for quite some time, with frequent references to historical precedent in transvestite and transsexual publications like *The Femme Forum* in the late 1960s, *Renaissance* in the 1970s, and *Our Sorority* in the 1980s. Even before that, sexological treatments of what would come to be known as transness, like Magnus Hirschfeld's *Transvestites* (1910) and Harry Benjamin's *The Transsexual Phenomenon* (1966)—both widely read by trans people—contained extensive reference to historical precedent. It took, however, quite a bit longer for trans history as such to coalesce. Leslie Feinberg's *Transgender Warriors* (1996), written for a popular press, is generally regarded as the first book-length study of trans history. Academic trans history would not get going until 2002 with the publication of Joanne Meyerowitz's *How Sex Changed*, and it did not take off in a sustained manner until the final years of the 2010s with the rapid-fire publication of Emma Heaney's *The New Woman*, Emily Skidmore's *True Sex*, and C. Riley Snorton's *Black on Both Sides*

public and epistemological existence have coalesced around the argument that transness is some kind of dangerous, newfangled trend.[vii] To counter this, trans people and academic historians have worked to show that even if named categories have shifted over time, people who might be considered trans today have a long history. This recovery of stories of pre-1950s figures stands to solve one problem by refuting a version of history in which trans people did not exist in the past. As someone who came to transness because of a history of sexuality class, I fully appreciate that this recovery work makes clear how trans people have been rendered invisible and that people have existed outside the bounds of normative gender, sex, and sexuality across time and place. This crucial work, however, is not enough on its own.

These histories hold fast to the idea that trans people have always existed as a small minority, while most people's sex and gender just happen to coincide. They project what we now call cisness—a match between sex assigned at birth and gender identity, the opposite of transness—onto the majority of people who have ever lived. The methods deployed to write about trans people before explicit trans categories, especially, imply that nearly everyone fits neatly into the sex and gender category they were assigned at birth. Most people, in this model, are presumed cis.[viii] At the

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in 2017, and Jules Gill-Peterson's *Histories of the Transgender Child* and Howard Chiang's *After Eunuchs* in 2018.

vii The *New York Times* loves this vibe. But it's everywhere, from Ab*gail Shr*er, whom I'm not going to cite (elided like the torso of the trans person on her book cover!), to Samuel Alito's dissenting opinion in *Bostock v. Clayton County*, where he argued that trans people cannot be protected from employment discrimination because when Title VII was written, no one would have been understood as trans. Alito cited Joanne Meyerowitz, on whose behalf I remain outraged, to claim that while some people living in 1964 may have experienced gender dysphoria, "terms like [*transgender status* and *gender identity*] would have left people at the time scratching their heads"—never mind that *How Sex Changed* literally opens with the 1952 publicity surrounding Christine Jorgensen's transition. Like, it's ultimately way more egregious that he's a shitty transphobe, not to mention his role in trading *Roe v. Wade* for the ongoing catastrophe of restrictions on abortion, but come on, dude, 1964 is twelve years later than 1952! It's the first fucking sentence of the book!

viii It's important to note that I don't use *cisgender* as an ontological state, but as an approximation using the most concise language presently available. I mean something more akin to the rather wordy "people who experience life as not-trans, whether materially or in terms of identity." Historically, something like "normal men and women" might be more accurate—which is so vague as to

same time that historians have fruitfully told trans stories, we have unintentionally naturalized a cis/trans binary that persists on its own over time. This book argues that cisness is not a natural state—instead, the idea that most people fit into their assigned sex category took a tremendous amount of work to construct and takes a tremendous amount of work to maintain.

Because trans history emerged as a subset of the history of sexuality, those studying transness in the past have largely followed its norms regarding the use of contemporary categories to describe historical actors, namely, don't refer to people using a category before that category existed.[6] In the case of trans history, that means (ostensibly) no "transvestites" before the 1910s, "transsexuals" before the 1950s and 1960s, or "transgender" people before the 1960s, or if you're being extra careful, before the word came into widespread use in the 1990s.[7] While there's debate about the precise use of these terms, and even more about whether pre-1950s figures like the "invert," "fairy," and "passing woman" should be considered trans, the idea that categories need to be narrowly historicized remains.[ix] Hewing closely to this disciplinary norm is one way that trans history has legitimized itself while having to insist on its objects of analysis as worth spending time and tenure lines on, particularly for historians

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be useless. Part of the problem is that we don't yet have a robust conceptualization of how to talk about the many different ways of failing to fit into normative gender categories. A cis/trans binary is a wild oversimplification, but I still run into a different set of bureaucratic, medical, and social roadblocks than, say, my decidedly not trans mother, which makes cisness, though imperfect, a useful shorthand. We also have not yet sufficiently theorized the relationship between *binary* (i.e., male or female) and *static* (i.e., not changing categories); so far, that has resulted in more lateral violence about whether nonbinary people are really trans than a nuanced unpacking of how there are multiple ways to do gender wrong. Regulatory and knowledge systems in the United States and elsewhere demand both categorization as male or female *and* fixity within that category, and they punish or refuse to recognize various combinations of wrongness—this can happen for different reasons for violating different norms, all of it sucks, and I'm pretty confident the problem is actually cis people. *Cisgender*, as I use it, refers to a male or female sex classification assumed to be static in a system that penalizes anyone who doesn't do both (including people who don't identify as trans). Cf. Amin, "We Are All Nonbinary."

ix This means that books like *Transgender Warriors* are not considered rigorous history.

who are themselves trans while navigating trans-exclusive or at the very least trans-disinterested universities.

In the process of displaying acceptable sorting processes, trans history runs up against the problem of who counts as a subject of trans history. This is particularly fraught when writing about people who lived before the invention of the aforementioned trans categories.[x] One can't simply run a keyword search for "transgender" in a nineteenth-century newspaper database; decisions must be made. As a result, historians often supply a performance of uncertainty regarding what transness might mean before the mid-twentieth century. Trans histories generally contain a paragraph, sometimes pages, explaining their use of terminology and how the author decided who to count as trans. If you read through these paragraphs in quick succession, it becomes clear that for all of the expressed anxiety about who to identify (or not) as trans, they're pretty much in agreement.

Processes of crossing and movement are key. The subject of trans history, especially in the pre-twentieth-century context, is someone who engages in "various forms and degrees of cross-gender practices and identifications," or who persists in a gender presentation other than the one they were assigned at birth, one that is, again, "cross-gender."[8] Emily Skidmore has argued that her turn-of-the-twentieth-century subjects can rightfully be called "trans men," because they "transitioned from the gender assigned to them at birth to the one with which they identified."[9] Jen Manion

x Authors writing about the twentieth century seem less concerned with bounding the category "trans." An irony: Although much proverbial ink has been spilled over this, most trans histories have been written about periods before the mid-twentieth century. See, e.g., Boag, *Re-Dressing*; Sears, *Arresting Dress*; Skidmore, *True Sex*; and Manion, *Female Husbands*, and the recent uptick in pre- and early modern trans history (e.g., Gordon, *Glorious Bodies*, and LaFleur, Raskolinikov, and Kłosowska, *Trans Historical*). Meyerowitz's *How Sex Changed* and Gill-Peterson's *Histories of the Transgender Child* were, throughout most of this writing, the only monographs on twentieth-century trans history in the United States, joined in international perspective by Chiang's *After Eunuchs*. There have been a few additions in the latter stages of preparing this manuscript, like Avery Dame-Griff's *The Two Revolutions: A History of the Transgender Internet* and Gill-Peterson's *A Short History of Trans Misogyny* in 2024. Recent doctoral work by Emmett Harsin Drager and Os Keyes will hopefully soon add two more monographs to this count. Still, given the prolonged paucity of post-1950s trans history when so many sources are easily accessible and quite obvious, one wonders if the fuss over pre-1950s trans history is less a "methodology" problem and more a "lack of institutional support for trans history" problem.

proposes that the pre-twentieth-century "female husband" was "effectively a trans position," citing Susan Stryker's definition of *transgender* as referring to "people who move away from the gender they were assigned at birth."[10]

The practices that signify this movement also align across texts. Historians often search for identifying features and behaviors that correspond to something that looks like contemporary transness to locate transness in the past. Trans history thus tends to be populated by people who were arrested for cross-dressing, who appear in sensational accounts of "women masquerading as men," or who sought to make inhabiting their bodies more comfortable with physical interventions.[11] They may have changed their names and pronouns, worked a job that matched the gender they transitioned to within strictly gender-segmented labor markets, or had what at least looked like male/female romantic and sexual relationships (i.e., they were "masquerading as a man" while married to a woman).[xi] Frequently they make it into the historical record because they were outed, often through some kind of interaction with carceral regimes and medical or psychiatric institutions, or while being prepared for burial.[12] While it's the movement from one gender to another that constitutes transness, these other traits are evidence that movement has taken place.

The problem is this: Searching for a type of person who engages in certain behaviors unexpected for their assigned sex requires the formulation of and adherence to a classification system for transness. This book takes seriously foundational work in the study of classification that offers numerous cautionary tales about the consequences of cutting up the world. As Geoffrey Bowker and Susan Leigh Star put it in their pathbreaking *Sorting Things Out*, every classification system "valorizes some point of view and silences another."[13] That is, classification systems aren't neutral descriptions. They limit what it's possible to imagine and to do. Classification systems are made, made by people and institutions with their own interests and investments about who counts as what. They are often invisible infrastructures that surround us, that structure nearly every aspect of our lives: what diagnosis we get at the psychiatrist and how we're subsequently treated

xi These are patterns in the literature, not explicitly stated criteria for classification as trans. In a representative example, in the opening of *True Sex*, Skidmore recounts the stories of two trans men who both changed their names, married women, frequented saloons, and earned respect for their hard work as men (1–3).

when it appears in our medical record; whether or not we're a member of a legally protected class; what toxicants are accepted as safe in the water we drink. In practice, classification systems rarely fit everyone, everything, or every eventuality. When people come into contact with classification systems, especially people who don't easily fit into the available categories, disjunctures between system and person often result in harm as lives must twist to fit categories that can never encompass the full range and complexity of existence. Classifying is a high-stakes enterprise.

The classification practices of trans history do just what Bowker and Star warn against. The traits that scholars use to find trans people in archival documents only work because they're supposed to be distinctive—even as many people in the past who cross-dress or work unexpectedly gendered jobs are not considered trans.[xii] The reliance on purportedly distinctive traits produces a view of the past in which some small number of people transgress gender to such a degree that they leave the category they were assigned at birth, but most people don't. Or to put it another way, as Susan Stryker does in *Transgender History*, being "'trans' is like being gay—some people are just 'that way,' though most people aren't."[14] This specific point of view—that trans people are "some minor fraction of the population"—assumes a happenstance, near-universal alignment between most sexed bodies and their gender identities.[15] If most people in the past are categorized as not-trans and don't require painstaking effort to locate, and trans people are a numerically small minority that need to be carefully searched for, then a cis/trans distinction seems natural and eternal. It hides how cisness has had to be constructed as a privileged way of being.[16]

No one is outright saying that everyone else has always been cis. After all, cisness only became a named concept in the mid-1990s, and it only began to see broader circulation in the early 2000s, so good historians would not call people in the past "cis." But that's the point: You don't have to bother saying anyone *wasn't* trans. "Cis," as Finn Enke has succinctly

xii Sears's *Arresting Dress* illuminates this tension—Sears proposes a "trans-ing" analysis that "can reinvigorate and open up cross-dressing histories, without embracing every cross-dressing trace as indicative of a lesbian, gay, or transgender past" (6). On one hand, Sears's approach makes a very similar move to this book in resisting definitive categorization; on the other, it still implies that while everyone might cross-dress, some of those people are trans and some are not. Some women "used men's clothing . . . to challenge the limited social roles assigned to them," Sears writes, but "for the most part these women did not seek to become men" (64).

put it, "never needs to prove itself."[17] Herein lies the central contention of this book's methodological underpinnings. Most people *don't* just happen to fit the category they were assigned.[xiii] A whole apparatus churns along in the background, willfully ignored, to make it *seem* like they do. The power of cisness comes precisely from this hiding of its own invention, and it is there that trans history can intervene. Let me be clear—historians can argue for the importance of writing histories of trans people *and* refuse a cis/trans binary. As Eve Kosofsky Sedgwick put it, we need a "multipronged movement . . . whose minority-model and universalist model strategies proceed in parallel without any high premium placed on ideological rationalization between them."[18] Sedgwick discussed this coexistence of minoritizing and universalizing models of sexuality in terms of a fixed, distinct minority of homosexual individuals, on one hand, and a much more expansive model, on the other, in which bits and pieces of queerness attach themselves to a wider, more nebulous range of people of various identities. The same dynamic applies to simultaneously talking about trans people and the systemic incoherence of sex and gender that pertains to everyone. I take a universalizing approach to show how gendered power operates by sorting most people into normative categories even though they don't remotely fit that norm, and then pretending that sorting hasn't happened.

This book's approach to trans history builds on scholarship in trans history and historical work in trans studies, which have both shown the multitudinous possibilities of gender that have existed throughout history, and expanded the bounds of transness itself to encompass analyses of racial formation, the nonhuman, and opaque figures who resist easy sorting into a modern trans category.[xiv] The past is a very trans place, this

xiii One is not born a woman, indeed. Simone de Beauvoir, Judith Butler, and a number of other feminist scholars have, over decades, established the constructedness of all gender, but the message seems to have gotten lost. The splitting of "gender" from "sex" soundly situated the body in easily identifiable, biologically based categories, in contrast to the mushy social and cultural stuff that feminist theory had the authority to make claims about.

xiv I distinguish between trans history and historical work in trans studies to draw attention to somewhat divergent methods and especially divergent levels of institutional support. While the past few years have seen the publication of several new monographs on trans history, more trans history and trans studies courses, and a small handful of job ads for history and gender studies positions that mention trans history and/or studies as a preferred specialty for applicants,

work has told us.[19] I offer a corollary: History is far less cis than one might anticipate. I propose a model of trans history that focuses on the systemic absurdity of static and binary gender and sex classification. Such an approach addresses the history of structures that have produced transness as rare exceptions to a rule. Instead of responding to accusations of newness with assertions that we've always been here, this book presents the provocation that if you want to talk about newfangled subject positions, we need to talk about cis people.

Trans history already has the necessary tools to do so, and scholars have recently moved away from an outright distinction between trans and cis.[20] Scholars taking this approach have begun to outline how putting trans analysis together with questions of race, species, and age all throw the notion of well-constructed cis/trans *and* male/female binaries into disarray.[21] The recent collection *Feminism Against Cisness*, to which I contributed an expanded version of this section, is particularly exciting in this regard; the volume posits that for feminism to "address patriarchy without reifying the categories—woman and man" that it relies on, it must disavow cisness. The essays within treat cisness as a contingent political formation in service of white, colonial, bourgeois brutality. Even before this recent resurgence, there is a longer tradition of using trans analysis to demonstrate the constructedness of *all* sex and gender. In the late 1980s

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it should be noted that there is far greater enthusiasm for trans studies *outside* of history departments than within them. See, e.g., several of the most recent works on the history of transness published by scholars working outside of history departments: Snorton, *Black on Both Sides* (now English, previously Africana studies); Gill-Peterson, *Histories of the Transgender Child* (English when the book was published); Heaney, *The New Woman* (English); and the essays in Chess, Gordon, and Fisher, "Early Modern Trans Studies" (English and various types of literature departments). This is not to say there is *no* trans history coming out of history departments in recent years. There certainly is: Skidmore, Manion, and Chiang are all publishing on trans history from history departments. Gill-Peterson and I traded places, maintaining the numbers despite my ascension to the tenure track: she is now based in a history department, while I have landed in a stand-alone history and sociology of science department. Regardless, it's striking to see how many of the most influential voices in trans history right now are working external to disciplinary history, and it is perhaps worth considering how this path of field formation has influenced what kinds of trans histories are being written. For a brief discussion of trans approaches being pushed out of disciplinary history, see Stryker, "Transgender History, Homonormativity, and Disciplinarity," especially pages 153–55.

and early 1990s, scholars argued that looking at the history of transness exposes how binary gender classification systems are made and how they unravel under scrutiny.

In 1987, Sandy Stone articulated this framing in her rebuttal of Janice Raymond's *The Transsexual Empire*, which had argued that "transsexualism" reinforced patriarchal gender stereotypes. Stone argued that it was doctors specifically who insisted that trans people adhere to gender stereotypes. This corrective, though, was not just an origin story for well-rehearsed narratives that Stone and others had been effectively forced to recount to access transition-related hormones and surgeries. "The origin of gender dysphoria clinics," Stone said of the institutionalization of requirements that trans people perform gender "correctly," "is a microcosmic look at the construction of criteria for gender."[22] Historicizing how trans women were assessed for femininity made clear the borders of gender norms writ large.

Susan Stryker built on this in "My Words to Victor Frankenstein Above the Village of Chamounix." Stryker, too, took aim against medico-scientific efforts to subsume trans experience into normativity: American doctors of the mid- to late twentieth century deigned to provide care only if trans people hid their transitions. Like Frankenstein's monster, Stryker spoke back to her medical "creators," explaining that she had exceeded attempts to produce normative womanhood through scientific expertise.[xv] "I offer you this warning: the Nature you bedevil me with is a lie," Stryker wrote, referring to the supposed "unnaturalness" of trans bodies. "Do not trust it to protect you from what I represent, for it is a fabrication that cloaks the groundlessness of the privilege you seek to maintain for yourself at my expense. You are as constructed as me. . . . Heed my words, and you may well discover the seams and sutures in yourself."[23] This is the promise of trans history: to trouble the line between "natural" cisness and "unnatural" transness and thereby make it abundantly clear that "non-trans" people's sex and gender are just as constructed as trans people's.

The sites of knowledge production I examine in this book are places where researchers and clinicians routinely encountered bodies that did not match paradigmatic forms of male or female and then had to decide what to do with them. Sometimes, those bodies were labeled as deviant,

xv Subsequently, in an adjacent move, Meyerowitz and Gill-Peterson have examined how the development of "transsexuality" influenced the construction of "gender" at midcentury.

degenerate, and clearly other. More often, their existence was explained away as researchers shepherded them back into binary sex categories. The categories *male* and *female* became filled with bodies that did not match their definitions, and the definitions of male and female adapted in each sorting to receive their new contents. In other words, sex and gender categories do not simply fit or not fit; they are *made* to do so or not. Trans people, then, are not alone in exceeding sex and gender categories. People who don't imagine themselves as gender nonconforming and who are not viewed as such in their social worlds break the rules of sex and gender with shocking regularity, but many are either welcomed or forcefully yanked back into neat male and female categories.[xvi] If most people, according to a cisnormative historical imaginary, fit into the category they were assigned at birth, it's because the ways that the contents of those categories don't actually match what they're supposed to have been rendered invisible.

This is why I said earlier that even if you don't think trans history is relevant, it probably is. Given all the aforementioned work in trans history and trans studies, we are past the point where a rigorous study of gender can proceed as though the sex of only some bodies (i.e., trans bodies) has required negotiation, and that otherwise gender is the cultural baggage affixed to bodies that, for the most part, naturally fall into male or female categories.[xvii] Trans studies can no longer be imagined as distinct from gender studies; I'd even wager that studying gender *without* engaging trans studies can only produce partial understanding that ignores much of the most innovative work about gender currently happening. Considering the history of gender and sex while assuming that sex simply exists as an incidental fact of biology misses a crucial part of that history.

Take, for example, Sandra Eder's recent *How the Clinic Made Gender*. While Eder very successfully discusses the convoluted enactments of gender as simultaneously fixed and malleable among clinicians working on intersex and congenital adrenal hyperplasia, the book ultimately reinscribes the very sex/gender distinction that it seeks to historicize. Male, female, and intersex operate as prediscursive, stable objects, with the "normal" sexes and genders of clinicians assumed to require no manage-

xvi Many, though, are not, and one of the underlying questions of this book is why some are punished for their deviance when for others, it can be overlooked.

xvii The exception, of course, being scholarship on intersex, e.g., Reis, *Bodies in Doubt,* and Karkazis, *Fixing Sex*. Keep this in mind—it will be important later, especially in chapter 3.

ment. Because this makes the power dynamics of the actors' relationships surprisingly opaque, it's hard to tell *why* the clinic made gender. Engagement with recent work in trans studies and history on the construction of cisness suggests, though, that clinicians may have had their own investments and sense of normality affirmed as they constructed the idea of gender on intersex bodies.[24] The stakes of engaging with trans thought, then, are high for the history of science and medicine, as well as broader histories of the body, gender, and sexuality. "Sex" is necessarily part of analyses of the life and human sciences, sexual behavior, the construction of gender (on its own and in relation to labor, race, disability, and many other intersections), and countless other topics. Because it's one of the most basic ways that humans and nonhumans alike are categorized, its incoherence cannot be ignored.

Let us apply the same suspicion of subject categories that suffuses trans history equally to all forms of sex and gender. As Afsaneh Najmabadi has offered in provocation, we need to ask not only whether there were any lesbians in medieval Europe, but also whether there were any women. "That we ask the first question [about lesbians] with comfort," Najmabadi continues, "and presume the ease of the answer to the second (well, of course there were women, but defined differently) works on the presumption of naturalness of woman; that there have always been women."[25] The approach to trans history has been much the same: Of course there were trans people, but they were defined differently. Of course there were cis people, but they were defined differently. I want to reframe the conversation such that it's not only "there are more trans people in the past than we thought," but also "there are fewer cis people than we thought, and perhaps none at all." Which is to say, sure, "trans" is a historically contingent, invented category—but so what? "Cis" is a historically contingent, invented category. So is "male"; so is "female." It's invention all the way down.

Situating Knowledge

I've been told that some of the choices I've made in this book may not be in the best interest of me getting tenure. It's polemical, the footnotes are snarky, and it's equally invested in intervening in trans studies as it is in intervening in the history of science and science and technology studies (STS). Effectively, as many well-intentioned colleagues (who I'm sure are now grimacing in horror) have implied, the transness of it all is unsafe.

I therefore want to be explicit about where this book stands in relation to what Stryker has called "the micropolitical practices through which the radical implications of transgender knowledges can become marginalized."[26] Stryker notes that trans knowledges are often deemed "personal," less intellectually rigorous, and overly reliant on embodied, experiential knowledge, giving as an example the many occasions of her work being consigned to commentary sections of journals or regarded as popular rather than scholarly history. I've experienced something similar with accusations of bias against science and medicine (and against white men, in particular), advice to tread with extreme caution, and suggestions to prune references to my own political investments from my work.[27] There is, in there somewhere, a recognition of the transphobia of the academy and what it might mean for my career chances; yet, to achieve legitimacy by conforming to a thin slice of academic norms, I would necessarily have to leave out the particular trans insights and stakes that inform my work.

Instead, this book cashes the checks that feminist STS has been writing for decades. It is personal and political because all knowledge production is personal and political.[28] My experience as nonbinary and trans shapes the questions I ask and the conclusions I draw here because that is how knowledge works.[xviii] Histories of science that have been written by cis people are also shaped by individual experiences of sex and gender; they, too, are partial perspectives.[29] Knowledge production of all kinds depends on embodied practices, even when it is not addressed.[30] The question, as usual, comes down to who is considered a reliable knower, and by what standards.[31] Given the long history of trans people not being considered reliable knowers of ourselves, it comes as no surprise that our scholarship is suspect.[32] Part of my effort here is an insistence that knowledge about sex is not any less rigorous when it comes from a trans perspective (and might even be more so). Hence, a book that takes seriously its own trans perspective, as well as its entry into the world in the mid-2020s, when not just trans knowledge but trans life is under constant threat. In so doing, it unapologetically mobilizes feminist STS and what we already know about the politics of knowledge and classification.

xviii An example of contradictory coexistence: I can both critique the category *trans* and also name myself as a trans person because what is useful to me in an analytic sense is not the same as what is useful to me in community membership and political legibility.

Bringing together the history of sexuality (especially queer history) and history of science/STS offers several additional methodological and intellectual interventions.[xix] These fields are poised at the edge of mutual benefit, but they mostly remain siloed from each other.[xx] Consequently, it's hard to find histories of sex that both attend to the specificity of category construction *and* do so in a way that isn't cis- and heteronormative.[33] Historians of science and STS scholars, on one hand, have extensively theorized classification and its enabling technologies.[34] Historians of sex and sexuality, on the other, have long been invested in the invention of nonnormative sexual categories, and they have paid close attention to how both sexologists and queer communities (and individual queer people) have come to know themselves as members of a distinct group.[35]

Here, I draw on both. I use methods derived from history of science and STS that privilege attention to on-the-ground practices of sorting and fact-making to build on decades of knowledge about categories of sex and sexuality. This enables me to track how sex categories coalesce and shift at a much more granular level than most histories of sexuality, which have largely—perhaps due to the borrowing of literary queer reading methods—approached sex science as a collection of texts, with less consideration of the networks and practices that produced those texts in the first place.[36] Turning to the practices of classification themselves, from paper-

xix Classification problems abound! I'm not interested in nitpicking the difference between history of science and STS. Increasingly, I'm feeling like the distinction is really just whether something is oriented toward social justice; if so, it's probably going to get labeled STS. I'm lumping them together here, partly because in drawing on both to do history of sex science, I don't think it particularly matters which is which (a hot take), and partly because despite all of these things ostensibly being my area of specialization, it remains unclear to me where anyone thinks my work falls. According to a very informal Twitter poll ($n = 17$), 23.5 percent of respondents said I do history of science, 29.4 percent said STS, 35.3 percent said history of sexuality, and 11.8 percent said queer and trans studies. Absolute chaos.

xx Scholars in the history of sexuality and trans studies are beginning to reach toward STS as an analytic: Gill-Peterson and Mak cite Annemarie Mol's foundational work on ontological multiplicity, and there is starting to be some overlap at the site of animality in trans studies (indicated by, e.g., the inclusion of chapters by STS scholars Mel Chen and Myra Hird in *Transgender Studies Reader 2*). On the whole, though, the fields remain separate, as indicated at the very least by the multitude of conferences I find myself having to go to in order to maintain a presence in both history of sexuality and history of science/STS.

work to funding structures to the relationship between abstraction and hands-on sorting, brings into sharp relief how sex categories have more to do with the power to classify than the bodies being sorted, and demonstrates the frequent divide between theory and practice in sex science. At the same time, I bring queer methods and concerns to the history of science. Building on decades of work in queer history and literary studies that have, with a careful eye, picked out the "queer presences and implications in texts that do not otherwise name them," as Siobhan Somerville has put it, I look for unintentional ends to which writers had no expectation of their work being used.[37] I do that in a different manner than the historians seeking traces of queer desire whose work informs mine—I look for failures of sex categories, rather than the presence of queer people.[38] Still, my propensity toward holding the archive upside down by its ankles to see what embarrassing scraps come out of its pockets is grounded in the reading practices that queer history taught me, applied here to the history of scientific knowledge production.

I also bring to the study of sex science a queer analytic. Histories of sex emerging out of history of science have tended to focus on the construction of binary sex.[39] Primarily, they have examined the patriarchal impulses that have led scientists to render women and men as fundamentally different from each other, usually for the sake of justifying women's (especially white women's) exclusion from political life and their social subjugation more broadly.[40] In essence, the field has thus far explained categories of maleness and femaleness always already conceived within a binary framework, with a goal of identifying how one category has been naturalized as better than the other rather than imagining liberation from the categories themselves. Even histories explicitly about the construction of a sex binary (or "two-sex model") itself concede that a binary was eventually successfully created.[41] I ask, instead, whether a binary ever coalesced, and I answer, not really.

While scientists in the period under study here often deployed distinct maleness and femaleness as research variables, and made social claims *as though* science wholeheartedly treated sex as a settled binary, a unified understanding of sex is hard to find in the historical record. What is often now referred to as "biological sex" is more of a cultural product than a scientific one.[xxi] "Biological sex" is far more conceptually unified

xxi A Google Ngram suggests that use of the term *biological sex* only really started to proliferate around 1970, increased steadily over the course of the

than what scientists themselves enact.[42] Yet, out of what I read as concerns of being taken seriously while making a feminist critique, historians of sex science who know biology is a construct nonetheless tend to defer to science as knowing the reality of sex. "I want to stress from the outset," Londa Schiebinger clarified in a foundational 1986 article on the history of visual renderings of "female" skeletal anatomy, a representative example of a broader tendency in histories of sex science, "that it is not my purpose to explain away physical differences between men and women but to analyze social and political circumstances surrounding the eighteenth-century search for sex differences."[43] With work like Schiebinger's having already laid the groundwork for disrupting biologized notions of essential, hierarchized differences between men and women, I do mean to suggest, to quote one of this book's epigraphs, "there is no such biological entity as sex."[44] Rather, as Geertje Mak has succinctly put it, "'Sex' is then not the physical thing, but the category to which a person belongs."[45] How something called "sex" came to function as though both humans and nonhumans are male and female because of some inherent physical state (and, therefore, men and women) is the central target of this book. The differences are the construct, and I'm here to explain them away.

This theoretical integrity of a category falling away upon examining actual scientific practice is by no means unique to sex science. Many other forms of knowledge production shift definitions, assume that objects rarely match prototypical ideals, and accept that the observed world is messier than their models.[46] Facts and objects of all kinds can be and often are incoherent and still do work—science, after all, is infrequently built on simple consensus.[47] Sex science differs, however, in the uneven distribution of harm that its incoherence causes. Sex science, imagined as an authority with access to a singular truth, informs who has access to medical care, job security, public space, a general sense of safety, and countless other quotidian needs. In the present, the violent, incoherent deployment of "biological sex" weighs most heavily on trans people, especially trans youth. So while sex science is not necessarily distinct in its knowledge production processes, their consequences distribute life chances particularly unequally.

1990s, and then rose precipitously from about 2012 through the present with only a brief leveling off around 2007 (potentially an artifact of the contents of Google Books).

While sex science has had particularly sweeping and dramatic effects, studies of historical (and contemporary) ontologies demonstrate the broader prevalence of multiple enactments of a given object. M. Murphy describes this analytic style as "accounts of how objects . . . came into being as recognizable objects via historically specific circumstances."[48] It builds on a central contention of STS: Facts are not facts because of things that really exist out there in the world, but rather become facts when people agree that they are true.[49] Likewise, discrete objects are not so because they exist, free-floating, waiting to be identified and described. Diseases, chemicals, species, and a whole array of other objects develop their existence *as things* as the result of contingent and specific practices. Simultaneously, as these things are enacted in multiple ways, they become an expanse of *different* things by the same name.[50] Combining historical ontology with the aforementioned attention to classification, STS is already quite methodologically queer in its dedication to questioning categorical stability far beyond sex and gender.

I take this mode of historical ontology as a point of departure to refuse the idea of sex as something that existed coherently before scientists began trying to figure out what it "really" was, and to consider it as an object that was and still is enacted differently by different people in different spaces for different reasons. I do not try to understand and re-create scientists' and doctors' assessments of where sex was located, or who was truly male or female, or who or what was hermaphroditic, or who was trans or cis—in essence, I do not imagine that there is a taxonomy that can be precisely understood. The logics I retrace are not the logics of successful delineation, but those of an often inchoate struggle to make knowledge out of complex bodies, reliant on tacit agreement to not look too closely at the contradictions contained within it.

There are two concepts worth parsing out before mashing them back together: multiplicity and incoherence. By "multiplicity," I invoke primarily the work of Annemarie Mol, who uses the example of atherosclerosis to show how objects are enacted through practices—they are constituted and re-constituted, depending on how people use and experience them. Mol demonstrates that the same thing can be enacted in different, often mutually exclusive, ways at different sites, and all of those ways really are *that thing*, not mere alternate perspectives on it. For the pathologist in the lab, atherosclerosis *is* a thickened arterial wall that can be observed and dissected under a microscope. For the clinician, however, atherosclerosis

is the leg pain that a patient complains of.[51] In the process, Mol succinctly puts it, "reality multiplies."[52] I operationalize a similar approach to multiplicity here. Sex *is* multiple things.[53] There is no single object called sex; instead, many sexes exist simultaneously, each of them equally real.

I use *incoherence* to get at a particular aspect of multiplicity where enactments conflict and cannot be resolved.[xxii] While Mol's version of multiplicity contends with tensions between different enactments, it also envisions these alternate realities as interdependent and nonexclusive.[54] There is a certain internal logic, a consistency. Even when there is contestation and for practical reasons an internist must send a patient to a surgeon who enacts disease quite differently, actors tend to stick to their usual enactment.[55] Less so with sex. In the present study, we find researchers changing their enactment of sex on the fly and keeping a toe in multiple realities at once. Sex derives its power from both its multiplicity and its ability to contain direct contradiction that might otherwise produce conflict.

In this respect, sex aligns, in part, with Leigh Star and James Griesemer's explanation of boundary objects—objects that "inhabit several intersecting social worlds . . . *and* satisfy the information requirements of each of them." Their utility comes from their preservation of contradiction so that they can adapt to "local needs" even as they "maintain a common identity across sites," or in other words, so that scientists with divergent meanings can understand each other and work to shared ends.[56] Boundary objects enable what Star and Griesemer call the "fundamental tension of science": how "findings which incorporate radically different meanings become coherent."[57] Eventually, they're usually replaced by (attempted) standardization.[58] Sex, however, did not become coherent so much as settle into incoherence. Sex remained multiple in its local uses in service of the myth of its universality. Its findings, rather than becoming coherent over time, were ignored so as to avoid an integrated version of sex that would profoundly constrain scientists' idiosyncratic enactments. There is also an affective element in my imagining of "incoherence"—this book reads against the grain by taking seriously the moments when deployments of sex start to seem not just divergent but absurd, held together, notwithstanding its illogic, with so much metaphorical spit and paper clips.

What I term the incoherence of sex relies on a state of not-knowing that enables contradictory knowledge to exist.[59] The multiple, incoherent en-

xxii To be clear, I don't mean incoherent as in incomprehensible. It's all quite comprehensible; it's just kind of ridiculous.

actments of sex in the period I focus on here coincided with a strong drive to structure social hierarchies, assumed biologically inherent, whether according to differences between men and women or to racial categories defined by differing levels of sexual dimorphism. For sex to be the basis of such social claims, it had to exist in multiple adaptable forms; yet, for one enactment of sex to avoid getting in the way of other contradictory enactments, vast swaths of sexual knowledge had to selectively be unknown.[xxiii] Exceptions to scientific rules—anomalies—became irrelevant rather than spurring a rethinking of knowledge systems as a whole.[xxiv] Jules Gill-Peterson has argued that by the 1950s "sex was in crisis" as a result of research on sexual plasticity in children, which had undermined the idea of sex as binary.[60] I argue that there had already been a multidecade barrage of anomalies, some treated as noise and some made significant, almost all of which made professionalized sex research an important tool for solving these problems. Thus, an opening gambit of this book: Scientists have rendered the many exceptions to static, binary sex insignificant enough to keep them from overrunning the entire system.

I started this project with the romanticized idea that queer liberation would come from a rejection of classificatory structures. I still, in many ways, believe this: While ever-more-precise identity categories can have social and political utility, they also tend to demand frozen legibility, not to mention their vibe reminiscent of the table of contents of *Psychopathia Sexualis*.[xxv] They largely presume a preexisting set of categories, often biologized.[61] But incoherence is an incoherent thing. It can be part of a politics of refusal, of saying no to invasive questions and the need to prove

xxiii Eve Kosofsky Sedgwick's remarks on "ignorance effects" in *Epistemology of the Closet* (4–8) apply: Not knowing, and incitements not to know, dictates the range of discursive possibility just as much as the creation of knowledge.

xxiv See Kuhn, *Structure of Scientific Revolutions*, and Shapin and Schaffer, *Leviathan*, on how anomalies can be rendered noise or calibration errors in order to preserve an existing mode of thought. Kuhn, given his disinterest in reckoning with power and social forces, was an unlikely inspiration for this project. Anomalies, in his rendering, eventually pile up and can no longer be ignored and cause a crisis, which causes a paradigm shift. Meanwhile, I was finding sex anomalies everywhere and the stubborn persistence of binary sex despite them. Something, I realized, must have been preventing those anomalies from becoming meaningful, and here we are. Thanks, Tom!

xxv Foucault, after all, warned at the end of *History of Sexuality* of the declaration of sexual identity enabling capture within the biopolitical regime of sexual knowledge production.

one's existence.[62] Embracing incoherence can be a way of mitigating the damage, or "torque," as Bowker and Star have framed it, caused by trying to cram lives into imposed classification systems.[63] An imagining of queerness as exceeding definition and impossible to pin down has been a rich analytic frame, both within the academy and outside of it as queer people—myself included—question narrowly bounded categories.[64]

At the same time, incoherence can be mobilized to cause harm and weaponized to enact violence with truly impressive agility, as many moments of this book show, as well as to avoid responsibility for solving problems.[65] Incoherence may produce feelings of risk that cannot be divorced from biopolitical decisions about who gets care and resources and who doesn't, who gets too much attention and who gets abandoned, and who is worth protecting from whom.[66] In the last few years, trans bodily plasticity, effectively a physical form of incoherence, has come under scrutiny by scholars concerned with how abilities to reshape bodies have, in part, their origins in the violence of slavery and eugenics.[67] Anti-transition rhetoric has relied substantially on the production of uncertainty to justify paternalistic "save the children" narratives.[68]

This book refuses the naturalness of sex categories by showing how scientists used incoherence to smooth over evidentiary conflict, make sex categories look natural, and establish science as the proper way to know things about them. To be clear, pointing out the use of incoherence by scientists is not a call for "better" science. While some STS scholars writing about sex have deployed a tactic of holding scientists accountable to their own standards of rigor, I am less interested in engaging with science on its own terms.[69] Nor do I want to appeal to some unified vision of what science—which has never had a unified vision of sex—says about natural diversity. I want, instead, to consider whether science can know sex without doing harm, if there can be a queer science beyond science *about* queerness, and what other methods we might imagine for knowing sex outside of science. The answers to these questions are outside the scope of this book, but I hope this can be a starting point for asking them.[xxvi]

xxvi I've been teaching a Queer Science seminar the last few years, and depending on how it goes, sometimes students conclude that queerness and science are antithetical to each other, and sometimes they decide that hope for a

Finally, This Book

What follows traces studies of sex across zoology, eugenics, gynecology, statistical sexology, and early trans medicine. These knowledge spaces were tied together both conceptually and by a network of colleagues and institutions that, between the mid-nineteenth and mid-twentieth centuries, created a wide-ranging but well-connected domain of knowledge.[70] Crucial findings and theories about sex developed through these inter- and cross-disciplinary relationships and infrastructures. The same individuals show up again and again—the men (they were mostly, though not entirely, men) who studied sex in this moment saw themselves as a pioneering group on the cutting edge of science and respectability. They attended conferences together, they taught and learned from each other, they served on the same committees, and they stopped for dinner at each other's homes when passing through town. Between them, and sometimes even individually, they produced incoherent enactments of sex, often unintentional and unstated but necessary to their work. The tentacular reach of sex science through multiple domains is part of its power: Its incoherence emerged not only from different meanings of male and female and what sex was, but also from the deployment of different methods of knowing (and not knowing), epistemologically and in daily practice.

In the period under study, science became a privileged site for understanding sex, but its outsize cultural influence does not correspond particularly well to its role as only one of many manufacturers of sex. The law, state bureaucracy, and various social and cultural apparatuses likewise increased their interest in sex during this period, and they, too, created incoherent enactments. Sometimes they did so in conversation with science: For example, the boundaries between immigration policy and scientific investigations of sexual deviance were paper thin as efforts to prevent "public charges" from entering the United States integrated assessments of sex development.[71] Other times, science had little to do with it, as in the recognition of the third-sex "fairy" in working-class communities in New York City.[72] In these cases, an expansive range of sexed possibility enabled justification of exclusion in the former, providing a way to make sense of an obviously extant social role in the latter. Sometimes, clearly demarcated male

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queer science remains. I remain agnostic: I'd love to believe it's possible to do science queerly but struggle to feel particularly hopeful about it.

and female categories served a greater use than more complex enactments. We'll see in chapters 2 and 4, for example, how enacting sex as binary and static frequently offered the path of least resistance for researchers processing large quantities of information.[xxvii] The matters of reproduction that most concerned agriculturists and heredity researchers also relied on a binarily sexed breeding pair of certain maleness and femaleness. Everyday usage, though, could undercut such stark categories. Life insurers, for example, classed applicants into two, stable sexes, intending to reflect divergent mortality rates between women and men. Yet using the same data, actuaries came to opposite conclusions about what sex meant for their bottom line, with some instituting policies that refused to insure or charged more for women, who apparently generated more risk than men, while others determined that women were in fact less likely to die in a given period and thus were cheaper to insure.[73] So, too, in sex science: Sometimes a binary was more useful, and sometimes it decidedly was not.

In this context, the researchers covered in the following chapters enacted sex. This book spans, roughly, the temporal bounds of the mid-nineteenth and mid-twentieth centuries, a century or so in which sex science began to coalesce into a legitimate topic of study and underwent considerable changes along the way.[74] Some scene-setting is therefore in order. On one end of that range, the study of sex in nonhumans presaged the development of sexology as historians typically consider it. In chapter 1, the United States was at the periphery of sex research. Historians have written extensively about the taxonomies of sexual personhood that had emerged across Western Europe around the 1870s and 1880s and subsequently proliferated throughout the first decades of the twentieth century. Especially in Germany and England, sexologists like Richard von Krafft-Ebing, Magnus Hirschfeld, and Havelock Ellis began using case studies of increasingly pathologized forms of sexual being to understand their etiologies and manifestations. Some were motivated by a desire to reduce sodomy's legal penalties, while others sought better scientific bases for social hygiene, colonial power, and various biopolitical regulatory schemes.[75] In the United States, however, research on sex had another trajectory: Expertise in sex and reproduction first accrued to the domains of zoology and agricultural science, supplemented by

xxvii I don't mean this in a technologically determinist sense; rather, researchers used a simple, commonsense approach rather than spend time and energy figuring out how to do something else.

European knowledge. Most American researchers, coming from both formal and amateur backgrounds, didn't conceptualize their work as sex science per se, and their research rarely centered on humans (though that knowledge often supported eugenic and racializing goals).[76] Their primary concerns were improving agricultural yields and quality, or contributing to a growing body of scholarship in the life sciences—also with a European center of gravity—that sought to understand the anatomy and physiology of sex.[77]

Chapter 1 turns to zoology and animal husbandry texts rather than the traditional source base of human sexology to explore the use of *sex* in this period. Unlike the rest of the book, it focuses exclusively on published sources to provide a grounding sense of where conversations and debates stood before the institutional consolidations that mark later chapters. These studies of animals produced two models whose contradictions would trouble sex research for over a century: In one, scientists could shore up their authority by identifying the "true" male or female sex of animal specimens; another framed hermaphroditism in "lower" organisms as more common than separate sexes. The former articulated stark differences between white women and men, while the latter supported theories of racial hierarchy based on degrees of sexual dimorphism. These parallel understandings of sex—sex was limitlessly knowable in a binary that allowed nothing outside of it, and also exceptions to that binary were constant and threatening—remained in tension throughout the period. This chapter close-reads nineteenth-century research on three problem animals that each show a facet of the struggle to make meaning out of sexual variation. Scientists established their own expertise by constructing hyenas' sexual morphology as a mystery; made sex itself malleable and sex organs effectively interchangeable in disagreements about freemartins; and added to confusion about what counted as maleness and femaleness in trying to reclassify worker ants and bees as female while popular science sources framed these insects' three-sex system as more advanced than sexual dimorphism. The failure of this research to successfully produce a stable binary stoked antimiscegenationist fears about a collapse of whiteness into animality. This chapter takes a broad approach compared to the deep anchoring in a particular individual or institution that follows in subsequent ones in order to highlight the multiplicity of sex manifesting across genres, fields, and methodologies, and its inseparability from evolutionarily informed racial politics. Sex science thus emerged not out of whole cloth and suddenly in the late nineteenth century but in fragments

from studies of animality and race that undergirded colonial and white supremacist thought and expansion.

These connections wound tighter from the first decade of the twentieth century through the 1930s, as American sexology institutionalized through and alongside eugenics, now supported by philanthropic money and, by the mid-1920s, federal funding augmented by private fortunes. Agriculture continued to generate knowledge about better breeding, and its knowledge was supplemented by the increasingly professionalized fields of psychiatry, psychology, and social work, as well as new findings in genetics, Mendelian evolution, and biometry. Grounded in the first decades of the twentieth century, chapter 2 looks at conflicting approaches to sex research in two prominent laboratories run by Charles Davenport in Cold Spring Harbor, New York: the Station for Experimental Evolution (SEE) and the Eugenics Record Office (ERO). The former saw sex as malleable and viewed this malleability as something to be manipulated for eugenic gain, while the latter employed a binary framework that supported its studies of heredity. While researchers at the Station like Oscar Riddle and Albert Blakeslee worked on projects about sex reversal and sex differentiation, ERO fieldworkers mapped the heritability of desirable and unwanted traits through reproductive male-female pairs. The Cold Spring Harbor case illustrates how sex researchers' understanding of what sex was could shift to suit their goals, and how they made sex binary and not binary, a classification system and a bodily process, and variously defined across species. As American eugenics rose to global prominence, it operated as a key site for the development of sex science.[78]

Around the same time, birth control, gynecology, and sex hygiene were critical sites for research that would improve reproductive and marital success for racial betterment.[79] Chapter 3 investigates the contradictions held within early to mid-twentieth-century gynecological research and private medical practice, foregrounding the work of the clinician, sexologist, and eugenicist Robert Latou Dickinson. Dickinson bridged an era of sex research that used case studies to understand pathology and another that used large data sets to search for normality; personally, he was a close correspondent of Charles Davenport, a main figure in chapter 2, and a mentor to Alfred Kinsey, whose research forms the basis of chapter 4. Dickinson was a virtuoso of incoherence. He espoused a belief that sex manifested in degrees rather than in binary kind; that theory all but disappeared in his assessment of white women patients. In case notes, correspondence, and publications, Dickinson framed pathology and pain as

components of normal white womanhood that need not trouble femaleness. Missing ovaries, menstrual insanity, and genitals supposedly transformed to a more masculine shape by masturbation did not, in practice, indicate that a patient might have strayed from her sex category, even as he asserted that "full sex endowment" was rare. The designations "female" and "woman" could be maintained as the very organs that were supposed to constitute them went awry. Alongside his expansion of the meaning of femaleness to encompass a tremendous range of bodily configurations, Dickinson's commitment to racial improvement led him on a quest to quantify and represent in visual form the ideal, eugenic female body. This chapter positions Dickinson's effort to identify that body—eventually rendered as the statue "Norma"—as a way to protect white sexual dimorphism even as he encountered an onslaught of evidence against it. The chapter also argues for a historiographic approach that does not always attempt to tease apart transness, homosexuality, intersex, and "normal" pathology.

By the 1940s, American sex research had ostensibly distanced itself from eugenics.[xxviii] On the cusp of this new world, entomologist-turned-sexologist Alfred Kinsey and his collaborators declared that they had brought the study of sex into the modern age. Chapter 4 examines incoherence in the largest and most heavily popularized study of twentieth-century American sex science. The case study was over, and so was an outdated understanding of sex as a spectrum. With university backing and considerable funding from the National Research Council Committee for Research in Problems of Sex, what came to be known as the "Kinsey Reports" used innovations in statistical practice to demonstrate that American sexual behavior was far more varied than previously believed. This narrative of novelty plastered over the many ways that the Kinsey studies drew on the past, especially their insistence on binary sex while presenting evidence to the contrary, linking of race with sexual deviance, and refusal of an Identitarian form of sexuality while foregrounding behavior over inherent type. In this quantitative behemoth, anomalies like those discussed in previous chapters became more formally noise. The Kinsey researchers privileged frequency and incidence as the most important facts about sex and treated anything they perceived as numerically uncommon as unimportant—especially the possibility of sex outside of a static binary.

xxviii Spoiler: It hadn't.

At midcentury, the United States consisted almost entirely of clearly male or female people, with only two options to choose from, still defined and enacted in a mess of incoherence. Most deviances, whether lingering assumptions about racialized sexual difference, bodies that did not quite conform to ideal types, or nonnormative behavior, had been recaptured back into femaleness and maleness. Anomalies had been rendered exceptional and therefore not disruptive. Chapter 5 brings the narrative to a close by examining how the development of the category "transsexual" posed little threat to binary sex and cemented the distinction of transsexuals as unusually discordant in body and identity compared to the masses of people who simply were not. This final chapter focuses on Harry Benjamin and Elmer Belt, early practitioners of trans medicine, as they attempted to sort out eligibility for transition-related surgery in the 1950s and early 1960s. Benjamin defined transsexuality as an uncomplicated desire for hormonal and surgical transition, but, obsessed with risks to themselves if a patient regretted having surgery, he and Belt created a gulf between taxonomic clarity and quotidian action. They traded questions of who counts as female or male and woman or man for concerns about who might sue them, reject their authority, and interfere in their efforts to self-fashion as medical pioneers. Management of those fears established habits of assessment and views of transsexuals as dishonest and psychologically deficient, which eventually structured requirements for surgical access more formally. By the end of the book's arc the incoherent enactments of a male/female binary are joined by a nascent cis/trans binary, in concept if not in name.

Sex science both shaped and responded to developments in disciplinary formation and changes in the political economy of sex research. While this book is not about either of those things per se, such shifts over time provide a foil for the continuity that is my focus here. Though the contours of sex research and its relation to knowledge structures and governance transformed over the period under study, the incoherence of sex persisted. It persists today, visible in the frantic redefinitions of sex by those who wish to bar trans people from bathrooms, sports, and other areas of public life. The book concludes with a brief discussion of the contemporary ramifications of this history and an assertion that attempting to counter anti-trans rhetoric and legislation with better science is bound to fail. I propose my own incoherent approach: a simultaneous insistence that there are more ways to know sex than science and that we need to take seriously the possibility that sex is not a useful category at all.

A brief note on terminology: Throughout this book, I use *binary* with some regularity to mean "exhaustive and mutually exclusive." My use of it is consciously ahistorical—while I considered avoiding the term, *binary* is ultimately the most concise and legible way to put it. However, a crucial thing had to happen for this to be the case: The concept of "binary" as "exhaustive and mutually exclusive" had to develop. Centuries of sources use *binary* to mean "a combination of two things of the same or a similar type, a pair, two."[80] Notably, that now-obsolete definition does *not* include the connotations of exhaustiveness and exclusivity, and that definition has been used for much more of the English language than the current one. Old English used the prefix twi-, derived from the Latin prefix bi- (also the root of binary, "binarium"), to mean, essentially, something with two parts that belong to the same category, rather than mutually exclusive opposites—for example, *twibille*, a two-edged ax, or *twi-féte*, two-footed.[81] The *Oxford English Dictionary* (OED) dates the first known usage of "bynaries" specifically to 1464, when John Capgrave used it in the phrase "þink þat 3e be mad of to natures, body and soule."[xxix] "Body" and "soule" are two aspects of the self here but not necessarily the only ones; indeed, the same manuscript refers to another binary of "love of God, and love of your neighbor," decidedly not an exhaustive list of lovable entities.[82]

This broader meaning of a matched pair continued on through the nineteenth century—an 1837 use refers to "the binaries of boats and Anubises," where two objects are again paired, but there are clearly more objects in the world than watercraft and Egyptian gods. In 1876, a book on color theory used "binary" to refer to colors made of two primary colors, yet green, for example, is not made of only two colors, nor is it a single distinct shade. It's not until the mid-twentieth century that "binary" comes to carry its present meaning, "consisting of two opposing or contrasting aspects."[83] Though somewhat speculative, my hunch is that the contemporary meaning of binary emerged alongside the development of electronic computing in the 1940s.[xxx] According to Google Ngram, use of *binary* increased substantially in the mid-1940s, further suggesting this

xxix Or, more modernly, "think that ye be made of two natures." Thank you to Caz Batten for assistance with Old English concepts of sex/gender and vocabulary!

xxx Thank you to Mar Hicks and David Dunning, who confirmed for me (not a historian of computing) that this makes historical sense.

relationship. The either/or mechanics of various forms of computing—a circuit is closed or not, a punched hole is present or not,[xxxi] code contains a 1 or a 0—provided a potent metaphor for thinking about twoness. No longer just related pairs, binary came to refer to two mutually exclusive options outside of which no additional possibilities exist. So the "binary" of "binary sex" is a product of the latter half of the twentieth century and not an actors' category, but I've nonetheless chosen to use it for simplicity.[xxxii]

"Sex," however, most certainly is an actors' category. When I say "sex," I refer to the vague, ever-mutating hydra with endless heads that is the object of study and research variable of my actors. Rather than attempt to impose precision on a category that was constructed without regard for consistency—and depended on a lack of consistency—I have allowed my terms to be somewhat slippery. I ask that you not take "sex" to mean "the biological" in contrast to a social or cultural gender. I mean something more akin to my actors' gesture toward the natural as a source of explanatory power for a particular axis of social classification, which might at any given time bundle morphology, social role, psychological feeling or identity, reproductive capacity, and sexual behavior, et cetera. I mostly don't use *gender* here, except in the final chapter, since it wasn't invented until the mid-twentieth century and my actors assumed that the above-mentioned generally went together. I use *woman/female* and *man/male* interchangeably, since, again, my actors mostly didn't separate them. This book is not an effort to decode precisely what historical actors meant when they talked about sex. Sex is a snarl of contradictions, and my goal here is not to untangle, or uncoil, or cut through Gordian-style. The knot is the thing. If this seems like a lazy analytic or use of terms, I ask that you take it up with the late nineteenth and early twentieth centuries, and join me in this exploration of what a refusal of coherence opens up.

xxxi Notwithstanding hanging chads.

xxxii With the risk of losing some nuances about the relationship of female and male. See Park, "Myth of the One-Sex Body."

Notes

Archival Collections

AFB: Albert Francis Blakeslee Papers
AKC: Alfred Kinsey Correspondence
CDP: Charles Davenport Papers
EROR: Eugenics Record Office Records
FWF: Field Worker Files
HBP: Harry Benjamin Papers
JWT: John W. Tukey Papers
LLC: Lawrence Collection
ORP: Oscar Riddle Papers
RMY: Robert Mearns Yerkes Papers

Introduction: A Trans History of Classification

1 Benjamin, *Transsexual Phenomenon*, 3.
2 See Kahan, *Book of Minor Perverts*, for a complementary argument about "multiple and conflicting . . . explanations of sexuality [that] came to exist simultaneously," 4. Our shared word choice was entirely incidental but validating when I first read *Minor Perverts*!
3 On the late consolidation of reproductive science compared to other life sciences, see Clarke, *Disciplining Reproduction*.
4 Foucault, *History of Sexuality*.

5 On the shifting developments of these categories as precursors to the contemporary "transgender," see Meyerowitz, *How Sex Changed*; Stryker, *Transgender History*; and Valentine, *Imagining Transgender*.

6 À la Foucault, *History of Sexuality*. On the invention of homosexuality, see also Halperin, "How to Do the History of Male Homosexuality"; Terry, *American Obsession*; D'Emilio, *Sexual Politics*; and Chauncey, *Gay New York*, among many others. While not all of these scholars agree with Foucault wholesale—D'Emilio and Chauncey put more stock in communities' understandings of themselves than in medical discourse—they all take as axiomatic the idea that sexual categories born of the late nineteenth century fundamentally differ from earlier understandings of sexual behavior. This raises the question of whether homosexuality and transness can be seen as historically comparable categories. On one hand, it seems suspect that they should be conflated and thus require the same methodology. On the other, the *splitting* of transness and homosexuality into separate categories of "sexual orientation" and "gender identity" masks their shared origins and the ways in which trans and other queer people who violate gender norms have historically been thrown under the bus to make gender-normative queer people seem more respectable. See Stryker, *Transgender History*, 151–52, as well as Stryker, "Transgender History, Homonormativity, and Disciplinarity," and Valentine, *Imagining Transgender*.

7 See Gordon's critique of the use of *transvestism* by scholars writing about periods before the twentieth century in *Glorious Bodies*. Stryker, *Transgender History*, 16, 18, 123.

8 Meyerowitz, *How Sex Changed*, 5; Boag, *Re-Dressing*, 52; Sears, *Arresting Dress*, 9.

9 Skidmore, *True Sex*, 10.

10 Manion, *Female Husbands*, 10. Stryker's definition comes from *Transgender History*, 1.

11 For cross-dressing, see Boag, *Re-Dressing*, and Sears, *Arresting Dress*. For female husbands, see Manion, *Female Husbands*. For passing or masquerading, see Manion, "Queer History"; Skidmore, *True Sex*; and LaFleur, "Precipitous Sensations." On physical changes, see Meyerowitz, *How Sex Changed*, and, more speculatively, LaFleur, "Trans Feminine Histories."

12 See, e.g., the story of Joseph Lobdell's encounters with state institutions in Manion, "Queer History," or the mysteriously named Mrs. Nash's outing when a friend changed the deceased Mrs. Nash's clothing for her burial in Boag, *Re-Dressing*, 130–38. On the ways that a heterosexual/homosexual binary relies on stable sex and gender categories, see Stryker, "Transgender History, Homonormativity, and Disciplinarity." See also Scott Larson's absolutely crucial piece on the ethical dimensions of working with these sources of violent outing to determine if historical figures were "really" trans, in "Laid Open," in *Trans Historical*.

13 Bowker and Star, *Sorting Things Out*, 5.

14 Stryker, *Transgender History*, 7. This is, however, Stryker writing a Trans 101; her other work questions the idea that transness is the unnatural move away from natural cisness. Nonetheless, this turn of phrase captures the minoritizing tendency of contemporary mainstream understandings of transness.

15 Stryker, *Transgender History*, 7.

16 This book is what Bowker and Star call an "infrastructural inversion": an analysis that "look[s] closely at technologies and arrangements that, by design and by habit, tend to fade into the woodwork." Bowker and Star, *Sorting Things Out*, 34.

17 Enke, "Education of Little Cis," 60.

18 Sedgwick, *Epistemology of the Closet*, 13.

19 For examples of this work, see the contents of Chess, Gordon, and Fisher, "Early Modern Trans Studies." Other recent examples of this expansive framing include many of the essays in LaFleur, Raskolnikov, and Kłosowska, *Trans Historical*, and Gordon, *Glorious Bodies*. I suspect the pre- and early modernists with literary inclinations are on to something!

20 E.g., Heaney, *New Woman*; Larson, "'Indescribable Being.'"

21 On race in trans studies, see Schuller, *Biopolitics of Feeling*; Snorton, *Black on Both Sides*; and Bey, *Cistem Failure*. This work follows a powerful scholarly repertoire, itself indebted to Black feminist thought; see, e.g., Spillers, "Mama's Baby"; Gilman, *Difference and Pathology*; Somerville, "Scientific Racism"; and Rosen, *Terror in the Heart of Freedom*. On species, see Luciano and Chen, "Has the Queer Ever Been Human?"; Hayward and Weinstein, "Tranimalities"; and Amin, "Trans* Plasticity." On age, see Stockton, *Queer Child*, and Gill-Peterson, *Histories of the Transgender Child*. See also Larson, "'Indescribable Being,'" and the essays in Chess, Gordon, and Fisher, "Early Modern Trans Studies," which stick closer to recognizably trans/trans-adjacent figures but emphasize that the question of whether they're trans or not is far less important than widening the range of texts to which we might apply trans analytics.

22 Stone, "*Empire* Strikes Back," 227.

23 Stryker, "My Words to Victor Frankenstein," 240–41.

24 E.g., the work of Marquis Bey, Emma Heaney, Finn Enke, C. Riley Snorton, and many others cited in this book.

25 Najmabadi, "Beyond the Americas," 18.

26 Stryker, "Transgender History, Homonormativity, and Disciplinarity," 153.

27 See Velocci, "Wrenching Torque," for an account of my own navigation of disciplinarity.

28 Haraway, "Situated Knowledges." See also Moore, Cowles, and Ramalingam, "Dilemmas of Archival Objectivity."

29 See, e.g., Schiebinger, "Skeletons in the Closet"; Traweek, *Beamtimes and Lifetimes*; and Oreskes, "Objectivity or Heroism?" for several discussions of how

investments in masculinity influence knowledge production practices and outcomes.

30 See Vertesi, "Seeing Like a Rover"; Myers, "Molecular Embodiments"; and Prentice, *Bodies in Formation*.

31 See Daston and Galison, *Objectivity*; Gieryn, "Boundary-Work"; and Daston, "Objectivity."

32 See Stone, "*Empire* Strikes Back"; Velocci, "Standards of Care"; Gill-Peterson, *Histories of the Transgender Child*; Meyerowitz, *How Sex Changed*; and Latham, "Making and Treating Trans Problems."

33 J. R. Latham's work is a stellar example of what bridging this gap portends.

34 E.g., Bulmer, "Why Is the Cassowary Not a Bird?"; Hacking, "Making Up People"; Ritvo, *Platypus and the Mermaid*; Winsor, *Reading the Shape of Nature*; Bowker and Star, *Sorting Things Out*; Mol, *Body Multiple*; TallBear, *Native American DNA*; McOuat, "From Cutting Nature at Its Joints"; Burnett, *Trying Leviathan*; and Robertson, "Granular Certainty."

35 See, among others, Foucault, *History of Sexuality*; Halperin, "How to Do the History of Male Homosexuality"; D'Emilio, *Sexual Politics*; D'Emilio, "Capitalism and Gay Identity"; Terry, *American Obsession*; Duggan, *Sapphic Slashers*; Chauncey, "From Sexual Inversion to Homosexuality"; Chauncey, *Gay New York*; Boag, *Same-Sex Affairs*; Kunzel, *Criminal Intimacy*; and Canaday, *Straight State*. Scholars have also shown that some people refused to be labeled with what they saw as pathologizing categories, e.g., Freedman, "'Burning of Letters,'" and Carter, "On Mother-Love."

36 For examples of this approach, see Somerville, "Scientific Racism," and Terry, *American Obsession*, which have as their source base touchstones of the sexology canon like works by Havelock Ellis and Richard von Krafft-Ebing. This is by no means a criticism of analyses of those texts, which were crucial to the formation of sexual categories at the turn of the century. Rather, attention to how science and classification themselves work offers a way to build on those foundations. On *networks*, which I use throughout as a shorthand for the relations between the many kinds of actors (human, animal, and institutional, as well as scientist, administrator, funder, and research subject—the list goes on) upon whose collaborative efforts science depends, see Callon, "Some Elements," and Latour, *Science in Action*.

37 Somerville, "Scientific Racism," 246. On queer reading against the grain, see Wrathall, "Provenance as Text"; Potter, "Queer Hoover"; and Freedman, "'Burning of Letters.'"

38 I look for failure because, as Leigh Star has pointed out, "the normally invisible quality of working infrastructure becomes visible when it breaks"—sex, in this case, being the infrastructure. Star, "Ethnography of Infrastructure," 382. My turn to thinking on failure is particularly indebted to Campos, *Radium and the Secret of Life*.

39 There is a substantial amount of work on hermaphroditism and intersex, some of which has been written by historians of science and STS scholars like Lorraine Daston, Katherine Park, and Katrina Karkazis. Historiographically, though, that work has come to be cited and imagined as *about intersex*, rather than *about sex*. History of sexology and sexual deviance, on one hand, and history of sex science, on the other, constitute largely separate historiographies. See Park and Daston, *Wonders and the Order of Nature*, and Karkazis, *Fixing Sex*.

40 See Schiebinger, *Nature's Body*; Russett, *Sexual Science*; Richardson, *Sex Itself*; and Moscucci, *Science of Woman*.

41 Laqueur, *Making Sex*; Schuller, *Biopolitics of Feeling*.

42 See Karkazis, "Misuses of 'Biological Sex.'" For contemporary accounts of this, see, e.g., McLaughlin et al., "Multivariate Models of Animal Sex"; Garcia-Sifuentes and Maney, "Reporting and Misreporting of Sex Differences"; DuBois and Shattuck-Heidorn, "Challenging the Binary"; Patsopoulos, Tatsioni, and Ioannidis, "Claims of Sex Differences"; Zemenick et al., "Six Principles"; and Ah-King and Ahnesjö, "'Sex Role' Concept."

43 Schiebinger, "Skeletons in the Closet," 46.

44 Lillie, "General Biological Introduction," 3.

45 Mak, *Doubting Sex*, 2.

46 See, for just one example, Whooley, *On the Heels of Ignorance*. I hear physics has a whole principle about it.

47 See Shapin and Schaffer, *Leviathan*; Gilbert and Mulkay, *Opening Pandora's Box*, chap. 4; and Star and Griesemer, "Institutional Ecology."

48 Murphy, *Sick Building Syndrome*, 7. On Indigenous approaches to these questions, see Todd, "Indigenous Feminist's Take."

49 Shapin and Schaffer, *Leviathan*; Latour, *Science in Action*.

50 Barad, *Meeting the Universe Halfway*; Murphy, *Sick Building Syndrome*; Mol, *Body Multiple*; Livingston, *Debility and the Moral Imagination*; and Bowker and Star, *Sorting Things Out*.

51 Mol, *Body Multiple*, 35.

52 Mol, *Body Multiple*, 5.

53 Mol's "Who Knows What a Woman Is" gets delightfully (or, when I first read it, unnervingly) close to making this argument! That piece focuses on competing enactments of sex in different branches of science, however, while I'm more concerned with the enactments of sex themselves.

54 Mol, *Body Multiple*, 178–81.

55 Mol, *Body Multiple*, 178.

56 Star and Griesemer, "Institutional Ecology," 393.

57 Star and Griesemer, "Institutional Ecology," 391.

58 Star, "This Is Not a Boundary Object," 615.

59 On knowledge not being made, see Proctor and Schiebinger, *Agnotology*; Schiebinger, *Plants and Empire*; and Murphy, *Sick Building Syndrome*. See also

Sedgwick's remarks on "ignorance effects" in *Epistemology of the Closet* (4–8): Not knowing and incitements not to know dictate the range of discursive possibility just as much as the creation of knowledge.

60 Gill-Peterson, *Histories of the Transgender Child*, 97.

61 Gay genes and trans brain scans are quintessential examples. See Clare, Grzanka, and Wuest, "Gay Genes in the Postgenomic Era."

62 On politics of refusal, see Simpson, *Mohawk Interruptus*. On state demands for gender legibility, see Beauchamp, *Going Stealth*, and Currah and Moore, "We Won't Know Who You Are."

63 Bowker and Star, *Sorting Things Out*.

64 For an overview, see Love, "Queer."

65 Murphy, *Sick Building Syndrome*; Velocci, "These Uncertain Times."

66 See Bouk, *How Our Days Became Numbered*; Aronowitz, *Risky Medicine*; Adams, Murphy, and Clarke, "Anticipation"; and Radin, "Alternative Facts."

67 Schuller, *Biopolitics of Feeling*; Gill-Peterson, *Histories of the Transgender Child*; Schuller and Gill-Peterson, "Biopolitics of Plasticity," especially Amin, "Trans* Plasticity."

68 See the conclusion.

69 See, e.g., Richardson, *Sex Itself*, and Karkazis and Jordan-Young, *Testosterone*.

70 For a deeper history of the institutions that collectively established American sex science, see Clarke, *Disciplining Reproduction*.

71 Canaday, *Straight State*; see also Currah, *Sex Is as Sex Does*, for a beautiful takedown of the concept of "legal sex."

72 Chauncey, *Gay New York*.

73 Bouk, *How Our Days Became Numbered*, 40n29, 227.

74 For discussions on the study of sex in the European tradition from antiquity to the early modern, see Laqueur, *Making Sex*, esp. chap. 2; Park, "Myth of the 'One-Sex Body'"; Cadden, *Meanings of Sex Difference in the Middle Ages*; and Schiebinger, *Nature's Body*.

75 See, e.g., Beccalossi, *Female Sexual Inversion*; Bauer, *English Literary Sexology*; Kahan, *Book of Minor Perverts*; and Sutton, *Sex Between Body and Mind*.

76 Johnson, *Just Queer Folks*, 30.

77 At this point in time, agricultural experiment stations were among the most important and well-funded spaces of American sex research. These institutions are beyond the scope of this book; for more, see G. Rosenberg, *4-H Harvest*; G. Rosenberg, "No Scrubs"; and Johnson, *Just Queer Folks*, chap. 1.

78 On American leadership in an international eugenics movement, see Klautke, "'Germans Are Beating Us,'" and Allen, "Misuse of Biological Hierarchies."

79 Kline, *Building a Better Race*, among others.

80 *Oxford English Dictionary* (OED), s.v. "binary" (n. & adj.), June 2024, https://doi.org/10.1093/OED/3895868093.

81 See *An Anglo-Saxon Dictionary Online*, s.v. 'Twi-,' accessed August 17, 2024, https://bosworthtoller.com/31232.
82 Capgrave, "Dedication to Edward IV," 91.
83 This and previous examples from *OED*, s.v. "binary."

Chapter 1. Constructing Sexual Multiplicity in Animal Research

1 Ritvo, *Platypus and the Mermaid*, xii. On the racialization of the human, see Z. Jackson, *Becoming Human*, and Kim, *Dangerous Crossings*.
2 See Bagemihl, *Biological Exuberance*, and Roughgarden, *Evolution's Rainbow*, for a far more thorough accounting of these exceptions than I can provide here.
3 See, respectively, Terry, *American Obsession*; Schuller, *Biopolitics of Feeling*; G. Rosenberg, *4-H Harvest*; and Willey, *Undoing Monogamy*.
4 See Oudshoorn, *Beyond the Natural Body*, and Meyerowitz, *How Sex Changed*.
5 For more on the impact of Kinsey's entomological training on his human sex research, see Drucker, *Classification of Sex*.
6 For the political usages of claims of natural sex difference, see Russett, *Sexual Science*; Bederman, *Manliness and Civilization*; Schiebinger, *Nature's Body*; Rosen, *Terror in the Heart of Freedom*; and Laqueur, *Making Sex*.
7 For an ur-text, see Haraway, *Primate Visions*, as well as Terry, "'Unnatural Acts.'" More recently, scholars have looked to the human/animal divide itself as a site for the regulation of sexuality. See, e.g., Giffney and Hird, *Queering the Non/Human*; Mortimer-Sandilands and Erickson, *Queer Ecologies*; Hayward and Weinstein, "Tranimalities"; Luciano and Chen, "Queer Inhumanisms"; Chen, *Animacies*; and Amin, "Trans* Plasticity."
8 See Foucault, *Herculine Barbin*; Dreger, *Hermaphrodites*; Richardson, *Sex Itself*; Schiebinger, "Skeletons in the Closet"; Sears, *Arresting Dress*; and Manion, "Queer History," among others. The main exception to this is *How Sex Changed*, which suggests that sex became more malleable during the twentieth century. Regina Kunzel, in *Criminal Intimacy*, also highlights that the consolidation of sexual categories where sexuality is concerned, too, was fragmentary and uneven.
9 Alice Dreger wrote about the "Age of the Gonad." See Ha, "Riddle of Sex," for an overview of some of these models.
10 Laqueur, *Making Sex*, 6. For two retorts, see Park and Nye, "Destiny Is Anatomy," and Park, "Myth of the One-Sex Body."
11 Richardson, *Sex Itself*, 36.
12 Many of the historical sources hyphenate the word as *free-martin*.
13 Clarke, *Disciplining Reproduction*.
14 Russett, *Sexual Science*; Schiebinger, *Nature's Body*.