

This article was downloaded by: [University of Utah]

On: 07 April 2015, At: 07:39

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Quarterly Journal of Speech

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rqjs20>

Improving Upon Nature: The Rhetorical Ecology of Chemical Language, Reproductive Endocrinology, and the Medicalization of Infertility

Robin E. Jensen

Published online: 02 Apr 2015.



[Click for updates](#)

To cite this article: Robin E. Jensen (2015) Improving Upon Nature: The Rhetorical Ecology of Chemical Language, Reproductive Endocrinology, and the Medicalization of Infertility, Quarterly Journal of Speech, 101:2, 329-353, DOI: [10.1080/00335630.2015.1025098](https://doi.org/10.1080/00335630.2015.1025098)

To link to this article: <http://dx.doi.org/10.1080/00335630.2015.1025098>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms &

Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Improving Upon Nature: The Rhetorical Ecology of Chemical Language, Reproductive Endocrinology, and the Medicalization of Infertility

Robin E. Jensen

Chemical theories of human fertility and reproduction first became prevalent in both technical and mainstream media outlets beginning in the 1930s and 1940s, and they have remained prevalent to this day. In this essay, I analyze a selection of primary sources from this era that defined human fertility as a chemically induced process, rather than, for instance, a characteristic related to the conservation of nervous energy or to moral physiology. The resulting rhetorical history demonstrates the ways in which this chemical rhetoric was appropriated to re-envision sex, gender, and reproductive health in light of appeals to biochemical variability, artificiality, and technical expertise. Tracing these appeals sheds light on the rhetorical ecology that supported the widespread medicalization of (in)fertility and demonstrates how public vocabularies of science and medicine are constituted as they move across and interact with broader social discourses.

Keywords: Fertility; Reproduction; Rhetorical History; Sex; Science

In 1889, an aging French-American physician contacted the Société de Biologie of Paris to report on the results of an experiment in which he injected himself with the crushed testicles of guinea pigs and dogs. In his report, Charles-Édouard Séguard-Brown

Robin E. Jensen is an Associate Professor in the Department of Communication at the University of Utah. She is grateful to attendees of the 2014 Park City Rhetoric Writing Retreat, as well as Barbara Biesecker and the manuscript's two anonymous reviewers, for their insightful comments concerning earlier versions of this manuscript. This project was enhanced considerably by Abigail Selzer King's keen archival assistance. Research support for this project was provided by the University of Utah's University Research Committee and the Obert C. and Grace A. Tanner Humanities Center. Correspondence to: Robin E. Jensen, Department of Communication, 255 S. Central Campus Dr., Salt Lake City, UT 84112, USA. Email: jensenrobine@gmail.com

claimed to have experienced an impressive list of rejuvenating effects from his investigation, and he put forth the hypothesis that a number of diverse illnesses could be successfully treated via the subcutaneous injection of testicular extracts. At the time, Séquard-Brown was almost unanimously written off as nothing more than a misguided alchemist, chasing eternal life well beyond the bounds of reason and scientific norms. Deeming him a “pentacle,” a symbol with historical ties to magical evocation, the *British Medical Journal* reported that Séquard-Brown’s statement recalled “the wild imaginings of mediaeval philosophers in search of an *elixir vitae*.”¹ Despite the many scientific contributions for which Séquard-Brown was recognized in the years leading up to his infamous experiment, his report to the Société made him the joke of scientific and medical communities worldwide for the remaining four years of his life.

After his death, however, Séquard-Brown’s seemingly eccentric ideas began to reveal themselves as nothing less than prescient in light of the finding that the endocrine system (rather than the nervous system alone) controls human physiological processing. Today, Séquard-Brown is celebrated as “the father of modern experimental endocrinology” and “the originator of hormone replacement therapy.”² Even more importantly for the purposes at hand, Séquard-Brown must also be recognized for catalyzing—however “unforeseen and undesigned”³—the transgressive fissure that allowed for a major reshaping of the diction of infertility in the early-to-mid-twentieth century. While his experiment was originally devised in light of popular energy conservation theories of reproductive health—theories that framed infertility not as the product of faulty internal chemistry but, rather, the defiance of moral physiology via misallocation of energy—the experiment ultimately produced some of the first and most widely publicized evidence for what would emerge as a new chemical theory of human reproduction. In this respect, his self-experimentation provided an early warrant for a transition in the 1930s and 1940s in which chemical words and metaphors, rather than appeals to nervous energy, came to comprise the foundation of (in)fertility rhetoric.⁴

Ultimately, this transition supported a public vocabulary—what Celeste M. Condit describes as “the acceptable words, myths, and characterizations used for warranting social behavior in a community”—that facilitated the long-term medicalization of infertility. Medicalization has been defined as a process in which the expertise of science and medicine (and the public vocabularies that support such expertise) is valued over lived and experiential knowledge and used to categorize aspects of social life as disease or abnormality.⁵ For example, scholars have examined the ways in which childbirth was medicalized in the nineteenth century. They have isolated a variety of interconnected political, cultural, and rhetorical mechanisms that traded assumptions about birth as a normal part of the life cycle, best dealt with by female relations and midwives in the home, with the contention that birth is an occasion for medical complications, best left to the purview of physicians working in closely monitored hospitals.⁶ Similarly, during the course of the twentieth century, what was referred to as infertility or sterility also became increasingly entrenched in the rhetorical and material realms of medicine and technology. Although the initial medicalization of infertility could be located in the rhetoric of infamous gynecologist

J. Marion Sims in the mid-nineteenth century,⁷ I argue that it was not until the 1930s and 1940s—and with the emergence of a public vocabulary of chemistry—that both technical and lay publics had the rhetorical tools to consistently constitute infertility as a medical condition.

That infertility and other reproductive health concerns remain, today, firmly entrenched within a rhetoric of medicalization has been well documented,⁸ but what has not been noted is the degree to which medicalization has been constructed from a chemical rhetoric of human reproduction that makes use of many of the same appeals featured in 1930s and 1940s sources. This essay builds a foundational case for that connection by outlining the rhetorical processes—the assumptions, tropes, and arguments—that supported medicalization over time. Specifically, this project draws from Jenny Edbauer’s theory of “rhetorical ecologies” to trace the emergence and circulation of public vocabularies of chemistry, biochemistry, and reproductive endocrinology, particularly as they informed and delineated issues of reproductive health. Edbauer proposes a shift in the “theorizing of public rhetorics” from “the scene of a situational context”—generally “conceptualized as a collection of [fixed, formed] elements”—to a circulating, dynamic ecology of discursive and material processes, events, and enactments. This move is designed to “add the dimensions of history and movement (back) into our visions/versions of rhetoric’s public situations” and “more fully theorize rhetoric as a public(s) creation.” In the case at hand, the rise of reproductive endocrinology—an offshoot of biochemistry—was supported by a public–professional interplay that, in retrospect, highlights rhetoric’s “distributed ecological spread” and sheds light on the construction and diffusion of scientific rhetoric through public and popular spheres.⁹

Correspondingly, the study of this particular amalgamation of events in rhetorical history provides an opportunity to explore the ways in which public vocabularies of science and medicine undergo what Edbauer describes as “an extended half-life” as they expand “through the mutations and new exposures attached to that given rhetoric, much like a virus.” Counter to models of rhetoric that distinguish the technical from the public or private, this analysis outlines how seemingly technical vocabularies “move across” the broader social field, morphing and transforming according to a diversity of encounters and forces along the way.¹⁰ A wealth of studies has emerged over the last few decades exploring the internal rhetorical workings of a range of scientific enterprises¹¹ as well as the ways in which technical rhetoric animates public-policy configurations and enactments,¹² but there remains a dearth of scholarship deciphering how the vocabularies of science and medicine are constituted in relationship to mainstream and vernacular rhetoric. This essay works to address this gap in the literature by modeling how an ecological approach to rhetorical histories of science and medicine delineate such vocabularies not *in situ* but as they transform through interchange into distinctly public rhetorics.

In what follows, I demonstrate that, after Séquard-Brown’s experiment, several forces related to the so-called chemical revolution and the rise of reproductive endocrinology cumulated in the 1930s and 1940s to situate a chemical rhetoric as central to the delineation of (in)fertility. After tracing these discursive forces as they

circulated and transformed over time, I draw from early scientific and mainstream books and articles discussing reproductive endocrinology, as well as from corresponding infertility-related press coverage, to explicate the vocabulary and arguments evident in this emergent, alternative conceptualization of human reproduction.¹³ I argue that, as appeals to vital energy and moral physiology were supplanted with discussions of internal chemistry and medical intervention, (in)fertility was re-envisioned as a derivative of chemical interactions, interactions that could be synthesized and had the potential to correct and even improve upon nature. From this perspective, nature was not something to be emulated but, rather, was something to be remedied and perfected. In tracing the rhetorical ecology of this period, I find that the extended half-life of this chemical rhetoric played out in terms of a public vocabulary that furthered three key tenets of reproductive health: that fertility must be understood according to the biochemical variability of heterosexual couples; that scientific progress will inevitably lead to the realization of a state of artificial fertility that exceeds what is possible through nature alone; and that the establishment of fertility requires the guidance of technical expertise. All three of these tenets supported the medicalization of (in)fertility, but, because they were the evolving products of a complex, at times resistive rhetorical ecology, their analysis provides an account of the medicalization process that is neither deterministic nor straightforward. In this respect, this essay demonstrates that the process of medicalization unfolds not only in “degrees,” as Peter Conrad theorizes, but also in terms of a range of intersecting, rhetorical encounters that support what Edbauer describes as “counter-rhetorics” and “cooptation[s].”¹⁴

The Chemical Revolution and Its Language

Walter Fisher theorizes that the explanatory accounts that help individuals and societies make sense of reality are made up of “good reasons,” which are evaluated according to discursive forces related to “matters of history, biography, culture, and character.”¹⁵ As these variables shift and change over time, so too do perceptions of what makes a reason acceptable or not. In the context of twentieth-century infertility rhetoric, the shift from the “good reasons” of energy conservation at the beginning of the century to that of reproductive endocrinology in the 1930s and 1940s was facilitated by the growing popularity of chemistry. Modern chemistry’s unique “shared rhetorical culture” had been slowly infiltrating scientific, public, and vernacular landscapes as far back as the late seventeenth and eighteenth centuries.¹⁶ In this respect, an overview of that culture as it was constructed over time sheds light on what ultimately made a chemical theory of reproduction persuasive.

The publication of Robert Boyle’s *The Sceptical Chymist* in 1661 is often cited as the field of modern chemistry’s instigator. Therein, Boyle put forth a theory of corpuscularism, a predecessor to the theory of atomism holding that physical matter is composed of moving, infinitesimal corpuscles rather than, for instance, the four basic Aristotelian elements. Boyle positioned himself at odds with alchemists who, since the time of the ancient Greeks, had worked to transmute base metals into gold

and, later, to develop tonics for curing diseases and extending life.¹⁷ This dichotomy separating the study of chemistry from that of alchemy is one that endured for centuries, even though, as Maurice P. Crosland explains, alchemists' means were identical to that of the modern chemist; and, key argumentative topoi and rhetorical figures from the world of alchemy were taken up via the language of chemistry, such as the use of sex- and gender-oriented metaphors.¹⁸ From this perspective, when Séquard-Brown's experiment was discounted as the work of an alchemist in the late nineteenth century, the medical community was drawing from a long-established strategy of divorcing what it deemed unbelievable and magical from the practices of so-called rational science.

Between the publication of *The Sceptical Chymist* in 1661 and the release of Séquard-Brown's report in 1889, a "chemical revolution" unfolded. This revolution involved the promotion of theories delineating the compound nature of many substances long believed to be simple; the exploration of affinities and repulsions between diverse substances; and the publication of a systematic chemical language—all what Kenneth S. Zagacki and William Keith would label "radical proposals" in that they forced the reappraisal of seemingly fundamental premises and thereby provided discursive support for a Kuhnian paradigm shift.¹⁹ Throughout this era, modern chemistry's assumptions and mode of ordering knowledge became increasingly evident even outside the scholarly discipline, a phenomenon that would have been necessary given that, as Carolyn R. Miller explains of Kuhnian theory, "the changing beliefs of a community" uphold scientific revolutions. To be sure, chemical societies—both professional and amateur—were emerging across Europe,²⁰ and individual chemists worked to popularize chemistry internationally. The German chemist Justus Liebig, for instance, penned a number of widely disseminated books and articles that touted the benefits of chemical knowledge to individuals and societies. He employed simple anecdotes and analogies gleaned from agriculture and other accessible topics to explain chemical materials and processes, and he attended to the often overlooked task of advertising scientific findings to diverse and even unspecialized audiences.²¹ His "interdisciplinary inspirational works of science," as Leah Ceccarelli might label them, played a role in sanctioning the study of academic chemistry, "stimulat[ing] the growth of community between different scientific disciplines,"²² and igniting public chemical education.²³

Such works also played a role in the widespread circulation of appeals to the "chemistry of everyday life" via turn-of-the-century popular press books, novels, educational brochures, museum exhibitions, public lecture series, and more.²⁴ Inspired initially by the conviction that members of an educated public must be conversant in chemistry, as they must be in politics, history, and philosophy, these texts were distinguishable as much for their titles (almost all of them featured the words "chemistry," "everyday life," "everyone," and/or "all laypeople") as for their equivocation of chemistry with progress. Their popularity among diverse audiences, which corresponded with rising literacy rates among working-class and rural populations and with the circulation of mainstream media messages situating scientific knowledge as within the purview of lay citizenry, ensured that many ideas

and terms associated with the chemical sciences were slowly becoming ingrained within the larger fabric of social life and, correspondingly, that laypeople were developing their own vernacular theories of chemical knowledge and reasoning.²⁵ Indeed, Katherine Pandora explains that “the creation of scientific knowledge” is “played out over a shared terrain where the mixing and overlapping and interfering of different forms of thought and actions from within the vernacular contributes to its character and shape.” It was in this manner that fragments of chemical nomenclature were molded by and drawn into the well of “vernacular science knowledge.”²⁶

Much popular chemical talk at this time, whether mediated or interpersonal, also garnered increased play in light of the corresponding emergence of the commercial chemical industry. Scientific findings related to the synthesis of materials ignited the manufacturing and sale of a wide range of synthetic products. Throughout nineteenth-century Europe and the United States, industrial chemists set their sights on developing and producing glass, soap, paper, fertilizer, dye, and more.²⁷ Railways and steamships offered up new, efficient methods for product distribution and helped to sustain an industrial revolution the likes of which had never been seen before. By the turn into the twentieth century, the chemical industry had become one of the major sources of employment for untrained workers in urban centers, and technologies of agriculture, transportation, and international conflict had been transformed completely by its products and implementations.²⁸ Twentieth-century professional organizations such as the American Chemical Society were behind a range of public education programs designed, according to a 1929 *Science* article, “to make chemistry understood by those outside it and to give that newness of vision and awakening of interest which come from a knowledge of what chemistry is doing and may do for us.”²⁹

Beyond chemistry’s ready application in industry and “the public discourse of scientists themselves,”³⁰ chemistry’s rise as a renowned, progressive science in the mid-nineteenth century can be attributed to the growing recognition of its role within the realm of the organic. Liebig, for instance, joined scientists trained largely as physicians and pharmacists in exploring “the chemistry of living things.”³¹ Empirical studies published as early as 1828 demonstrated that organic compounds could be derived from inorganic matter, a finding that was corroborated mid-century by the inscriptions of increasingly powerful microscopy.³² This postulate worked against theories of vitalism, which dichotomized organic from inorganic substances, and supported the conclusion that living matter was not entirely unlike inorganic matter, particularly in its dictation via internal chemical reactions. But it was not until 1903—just a few years after Séquard-Brown’s infamous experiment—that the chemist Carl Neuber coined the phrase “biochemistry” and the study of the chemical materials and processes within living cells became an internationally recognized endeavor.³³ Juda Hirsch Quastel contends that, over the first decade of the twentieth century, biochemists came to the conclusion that “the living cell is characterized by a complex of chemical reactions, each of which is capable of investigation by rigorous chemical, or physiochemical methods.” Their focused use of these methods, which they presented in terms of “the *problem-solving* topos of methodological relevance,” convinced many in the early years of the new century that internal chemical activity

drives and regulates numerous bodily processes, including reproduction.³⁴ This tenet—and the concatenation of processes, fluxes, and encounters upon which it was upheld—induced a transformation in both scientific and lay understandings of human health. At the dawn of the twentieth century, it had become clear to scientists in particular that human bodies, both individually and in terms of their reproduction, are governed by chemistry.

Exploration into the Chemistry of Life: Reproductive Endocrinology

Early twentieth-century biochemical insight was informed by corresponding rhetorics of endocrinology. Studies of the endocrine system offered up evidence concerning what exactly initiated and coordinated the body's many internal chemical reactions. The first endocrinologists—among whom Séquard-Brown must be included—identified “internal secretions” as substances emitted from endocrine glands that functioned as catalysts driving biochemical interactions.³⁵ By 1905, physiologist Ernest Henry Starling had introduced the term “hormone” to refer to a specific type of internal secretion that acts as a “chemical messenger” through the blood. Although it could be argued that the term “messenger” implies a passive response to a hierarchical command, Starling and those who adopted his language evoked the body-as-communication-network metaphor in a considerably less top-down fashion, framing hormonal communication as active, affective, and intentional rather than a rote exchange of orders. In 1907, for instance, Starling's colleague Edward Schäfer deemed these so-called hormonal messengers “actors” because he saw them as responsible for igniting and then actively regulating the reproductive work of the ovaries and the testicles.³⁶ This hormonal theory of reproduction contrasted with—and largely superseded—existing nervous theories in which the nerves alone (and the energy sustaining them) were believed to be solely responsible for stimulating reproduction. The idea that the nerves work only in combination with chemical hormones to facilitate reproduction garnered increasing, even exponential, scientific support from 1926 to 1940, a period that saw the “rise of reproductive endocrinology.”³⁷

Following the publication of Schäfer's provocative hypothesis, researchers commenced designing empirical studies to explicate the potential connections between hormones and human reproduction. At issue for this early class of reproductive endocrinologists was not only what factors supported fertility proper but also what factors were involved in its suppression, whether intended or involuntary. By 1910, they had garnered enough evidence on the topic that the vast majority of scientists and medical practitioners had accepted the idea of the existence of testicular and ovarian hormones and their function as chemical catalysts and bodily regulators. This change in scientific thinking, coupled with evolving post-war beliefs about the essential and invigorating—rather than superfluous and draining—role that sex played within the context of marriage, cultivated growing support for the continued study of the sex hormones' part in human reproduction.³⁸

In the United States, for instance, the Committee for Research in Problems of Sex was founded in 1921 under the National Research Council to support the

international “scientific study of sex as a biological phenomenon.” The committee’s first funded projects included those exploring the effects of castration on the release of sex hormones in mammals and the role hormones play in the estrous cycles of guinea pigs and rats. In 1923, the Committee on Maternal Health was formed to support research related to issues of fertility, namely endocrinology studies exploring the potential use of hormonal contraception within marriage. Other projects related to reproductive endocrinology obtained financial support through social- and health-conscious academic institutions and philanthropic foundations. And still other reproductive endocrinology projects obtained support from the pharmaceutical industry as the market potential for commercial hormone preparations came into focus.³⁹

With this complex of sponsorship in place, the subsequent two decades witnessed a host of what have been called groundbreaking “discoveries.”⁴⁰ Reproductive endocrinologists in cooperation with physiologists and biochemists delineated the hormonal patterns driving human menstruation and ovulation, a process that depended significantly upon the isolation, crystallization, and eventual synthesis of hormones known today as estrogen and progesterone. Such work was facilitated by the emergence of a range of material “transcription devices,” as Latour and Woolgar term them, such as X-ray machines, extraction apparatuses, and culdoscopes that functioned to communicate “traces” of biochemical matter and construct “analogs” for scientific and clinical use. Over the following years, researchers also isolated and synthesized what is known today as testosterone, a feat that was delayed to some extent by a general lack of access to male-specific biological materials for study.⁴¹ In light of this research, Thomas Laqueur designates the 1920s and 1930s as the period in which “the power of science to predict and effect successful mating in humans and animals was considerably enhanced.”⁴²

This period was also the site of a major shift in scientific thinking about hormones’ sex specificity. Early delineations of hormonal activity upheld the idea that the uterus alone produces so-called female hormones and the testicles alone produce so-called male hormones. Female and male hormones, as well as the gonads that seemed to create them, were therefore conceptualized as “agents of masculinity and femininity.”⁴³ Building from this dichotomous understanding of biochemistry and sex, Walter Heape, a biologist and embryologist, published *Sex Antagonism* in 1913. Therein, he laid out a theory of the antagonistic nature of male and female hormones and extended this biochemical argument to justify the separation of the sexes in various social and political contexts. Nelly Oudshoorn finds that this argument and its cultural corollary was taken up in a range of medical and popular writings at the time, many of which employed battle metaphors to illustrate, for instance, that “the chemical war between the male and the female hormones is, as it were, a chemical miniature of the well-known eternal war between men and women.”⁴⁴ Subsequent proponents of Heape’s antagonism theory took this idea that the sexes were biochemical (and therefore social) opposites a step further by hypothesizing that the existence of so-called heterosexual hormones (female hormones in the male body,

or male hormones in the female body) is a sign of disease or “dysfunction” related to homosexuality or latent hermaphroditism.⁴⁵

Empirical findings published beginning in the late 1920s, however, called into question theories delineating an antagonistic relationship between sex hormones. Some of the most publicized of these findings identified, for instance, stallion urine as a highly concentrated source of “female” hormones; hormonal activity as linked to physiological processes beyond those of secondary sexual characteristics and reproduction; and the adrenal glands as additional sites of hormone production.⁴⁶ All bodies, it seemed, produced the so-called female and male hormones, and, furthermore, biochemical examination of such hormones revealed them to be constitutively similar. Although hormones continued to be widely termed “female” and “male” for years to come, a range of endocrine-related theories came to the fore in the 1930s that conceptualized such hormones as cooperative or feedback-oriented rather than as antagonistic, and thus as what Thomas J. Darwin describes as “intelligent” actors in the body’s metaphorical “integrated communication network.”⁴⁷ As a result, Celia Roberts explains that sexual differences were increasingly deemed—at least in technical circles—“a matter of relative quantities of particular chemicals, rather than absolute essences. A model of continuum between male and female, along which individuals could be placed as more or less feminine or masculine, became dominant.”⁴⁸ In the subsequent analysis of primary texts from the 1930s and 1940s, I find that this spectrum-oriented understanding of sex and gender extended in some key ways to rhetorical constructions of (in)fertility. Like sex, fertility, or lack thereof, was increasingly characterized during this era as the result of a balance of different chemicals not only in female bodies but also in male bodies and in pairings of the two.

Infertility Rhetoric in the 1930s and 1940s

Post-World War I infertility rhetoric was increasingly likely to further or otherwise draw from chemical explanations for reproductive health. More specifically, scientific publications and correspondence, as well as mainstream books and articles, tended to frame (in)fertility as a process catalyzed and regulated by internal chemistry; as existent on a continuum of biochemical variability according to individual women, men, and pairings of the two; and as potentially synthetically derived via technical experts capable of improving upon nature. All three of these themes furthered the process of medicalization, though the ways in which they emerged across broader social fields of discourse countered an entirely top-down, deterministic delineation of (in)fertility.

Chemical Agents

As one might expect, scientists’ and clinicians’ technical rhetoric provides the earliest evidence of public attempts to frame human reproduction as stimulated by internal chemicals.⁴⁹ Following in Starling’s wake in particular (who selected the term

“hormones” based on its Greek root, “‘hormao,’ which means ‘to put into quick motion, to excite or arouse’”),⁵⁰ researchers such as physiologist George Washington Corner published reports of empirical findings that highlighted the “endocrine action” driving processes such as ovulation and conception. Specifically, Corner offered support for a hormonal theory of menstruation.⁵¹ In 1927, he summarized a corollary of this theory, maintaining that “ovulation is a periodic function occurring regularly at about the middle of the interval between two menstrual hemorrhages.” Before World War I, very little was known about the menstrual cycle, and what was known was eventually revealed to be startlingly wrong. Early advocates of the rhythm method of contraception, for example, outlined the safe period for sexual activity as exactly at the point at which pregnancy is now known to be most likely to occur.⁵² By the late 1920s, however, Corner and contemporaries were demonstrating via animal experimentation that ovulation and menstruation do not occur simultaneously, as had been previously believed, and that ovulation—and thus conception—occurs in the middle of the month rather than at the end. Their findings relied largely on investigations in which rhesus monkeys—mammals believed to be analogous in some key ways to humans—were, as Corner bluntly put it, “killed” at different points in their menstrual cycles so that researchers could examine variables including the state of the ovarian corpus luteum and the endometrial lining. These experiments led Corner to the supposition that chemical hormones discharged from internal glands such as the corpus luteum were the “action” behind not only the physiology of menstruation but also of conception, pregnancy, and birth.⁵³

Other scientists and clinicians, including gynecologist Robert T. Frank, became similarly convinced of this idea and paralleled Corner’s rhetoric by framing hormones as the central agents of reproduction. In his 1929 clinical tract, *The Female Sex Hormone*, Frank posited that “throughout puberty the ovaries exert a continuous but low level stimulus upon the female genital tract.”⁵⁴ In this sentence, “the ovaries” served as a metonym for their product, “the female sex hormone,” a rhetorical maneuver that conflated this specific hormone with the female body proper and re-inscribed long-held beliefs about the female body as determined and controlled by the ovaries.⁵⁵ The ovaries/hormones’ role as stimulant for menstruation and the development of secondary sex characteristics served as the focus of not only this particular claim but also the book in its entirety. Indeed, Frank devoted a large portion of the volume to “chemistry” and, more specifically, the chemical make-up of the so-called female sex hormone. His detailed review of the hormone’s possible elements, valences, and overarching structure is justified via his assumptions that, first, hormonal actions are dependent upon their chemical constitutions and, second, human reproduction as a whole is therefore dependent upon internal chemistry.

By the 1930s, mainstream versions of these technical assumptions were surfacing in popular press coverage. From 1933 to 1934, for example, the *New York Times* featured a series of articles on “the hormones,” what science journalist William L. Laurence defined as “chemical substances” that are in “control” of a variety of bodily activities as they are carried through the blood and serve as “messengers of our bodies.” In his summary of meetings of the British Association for the Advancement

of Science and the American Chemical Society, Laurence attempted to provide an overview of various endocrine glands and their functions, briefly considering the “reproductive glands.”⁵⁶ A year later, he focused exclusively on the hormones believed to be responsible for reproduction, maintaining that most “infertility” could be “traced directly to improper functioning of some of the glands of internal secretion.” Laurence’s claim was grounded in the idea that a body lacking in specific internal chemical agents is an infertile body and, therefore, that chemistry’s “complicated molecules” are a—if not *the*—determinant of fertility.⁵⁷

In ensuing years, it would become increasingly difficult to decipher *if* or *how* this appeal to chemical agency was conveyed by scientific and clinical rhetoric to mainstream media coverage. The circulation of rhetoric featuring chemical reproductive actors seemed to be driven neither entirely from the top nor the bottom but rather from a central well of knowledge claims and vocabularies made available via an evolving rhetorical ecology.⁵⁸ For instance, as Corner was giving speeches on “ovarian therapy” before professional organizations such as the New York State Medical Board in 1934—speeches riddled with references to hormones as productive, “produc[ing] certain changes in the uterus which render it suitable for pregnancy” and helping to “prepare the mammary gland for lactation”—the Associated Press ran an article featured throughout a wide range of North American newspapers reporting that “a few drops of hormone extracts,” taken daily, is an effective “cure” for infertility.⁵⁹ And soon after gynecologist and infertility specialist Samuel Meaker published his book *Human Sterility*, wherein he cited endocrine disorders as the major source of human infertility, Laurence went so far as to characterize hormones as responsible for “producing fertility” in the *New York Times*, and Howard W. Blakeslee, writing for the Associated Press, framed the “activity” evident in “male sex hormones” as indicative of fertility.⁶⁰

Some of this permeability between technical and public spheres of rhetoric was buttressed by scientific experts’ attempts to author popular medical articles and books on (in)fertility and thereby speak directly with lay publics about reproductive endocrinology. For example, the high-profile physician and long-time editor of the *Journal of the American Medical Association*, Morris Fishbein, authored a popular “family doctor” newspaper column wherein he summarized “research on the glands” and highlighted how research findings were being used to produce synthetic hormones that could be injected into the body and thereby boost fertility.⁶¹ Similarly, Corner authored several popular books grounded in his professional expertise, books that he argued were for the “benefit of a general audience.” These works included *Ourselves Unborn* and *The Hormones in Human Reproduction*, the former of which was upheld by critics as “an exceedingly readable book, presenting a highly technical subject in a nontechnical fashion, and conveying a message which is of value to all who live to run the race of life.”⁶² Corner’s “charm,” as his reviewers put it,⁶³ along with his talent for employing simple metaphors in the service of public science education—at one point, for instance, he equated the endometrium with “a quick-lunch counter, with a supply of raw foods in the rear (in the blood stream), a row of cooks and waiters (the gland cells) and a line of customers (the cells of the

embryo)”—made for an entertaining, if not also informative, read. His emphasis in these books on the “subtle and potent chemistry” by which the “critical journey from conception to birth” is incurred offered up a clear picture of (in)fertility as a chemical derivative.⁶⁴

The Biochemical Continuum of Attraction

Beyond the idea that chemical agents control reproduction, the most consistent message across technical and popular-press infertility rhetoric from the 1930s and 1940s was that fertility exists on a variable continuum from low-to-high for individual women, individual men, and pairings of the two. In stark contrast to the majority of portrayals of fertility at the turn of the century, portrayals that conceptualized fertility as a state that women either possess or not, both technical and popular press accounts from this period argued that women *and* men possess varying and dynamic gradations of fertility. In *Human Sterility*, Meaker discussed an individual’s “reproductive capacity” in light of “relative clinical sterility,” noting that “perfect” fertility is medically defined and perhaps not a phenomenon that occurs in nature. He reasoned that a number of different factors including endocrine fluctuations and abnormalities play a role in limiting fertility—more or less—in any given individual case. To emphasize the point, he provided a graph featuring differing calibers of “clinical fertility” and explained that fertility “occurs in many grades or degrees, varying widely in different cases and fluctuating within narrower limits in the same case at different times” (see [Figure 1](#)). Meaker’s “clinical” qualification situated all cases of (in)fertility—regardless of degree or manifestation—firmly within the realm of medical jurisdiction and implied that couples who failed to achieve the “threshold of conception” were medically, and therefore socially, aberrant.⁶⁵ Indeed, the medicalization process itself perpetuates the idea that certain ways-of-being (in this case being married but not reproducing) are inherently problematic and therefore demand the very closest of oversight, assessment, and, ultimately, treatment.⁶⁶ Toward these ends, by the 1940s Meaker, along with his colleagues Charles H. Lawrence and Samuel N. Vose, was still referencing an individual’s “degree” of fertility in research publications, a phrase that Margaret Marsh and Wanda Ronner maintain as a defining feature of rhetoric about infertility from this era.⁶⁷

Drawing from this rhetoric of degrees, Meaker joined a growing chorus of scientists and clinicians dedicated to championing the argument that men are as likely as women, or at least almost as likely, to exhibit a low degree of fertility. Men, of course, had long been recognized as potentially sterile—particularly those men unable to ejaculate—and these cases still received a certain amount of attention within infertility rhetoric of the 1930s and 1940s,⁶⁸ but an increasing number of appeals from this time characterized *all* men as more or less “fertile.” Perhaps the most vocal proponent of this message was Dr. Sophia J. Kleegman, a clinical professor of gynecology at New York University College of Medicine. In a speech she gave before the Women’s Medical Society of New York State in 1938, she not only used the term “fertility” to describe men but also operationalized “male fertility” in terms

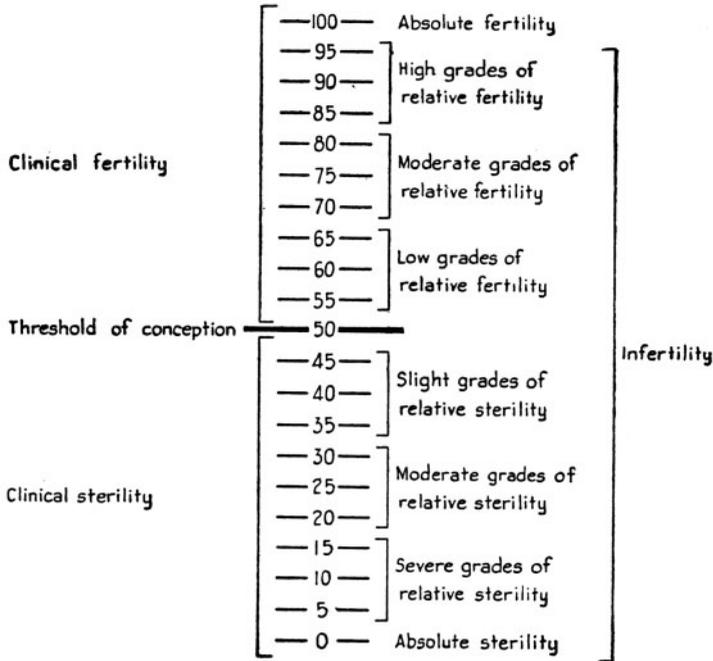


Figure 1 Dr. Samuel Meaker's graph of varying biochemical "degrees" of "clinical fertility," featured in his 1934 manual *Human Sterility*. Used by permission of Wolters Kluwer.

of close analysis of the sperm. Sperm, she argued, is "a most important index of a man's fertility." Drawing from recent research in microbiology, she provided an illustration of fifty differently shaped spermatozoon, beginning with one defined as "normal" and progressing through various divergences, each divergence related to an incrementally lower degree of fertility. Kleegman's analysis in this case and others is notable not only because it contributed to an increasingly medicalized account of male infertility—turning the traditionally male, scientific gaze of the microscope upon men's bodies and cells—but also because Kleegman spoke candidly about the many harms to women's bodies that had been incurred simply because "the onus of barrenness has been placed upon the female." Drawing from the terminology of the past—"barrenness"—Kleegman critiqued ongoing practices as outdated. She argued that "no surgery on the woman should be done for the relief of sterility, unless the husband's sperms, when examined according to new technique [*sic*] outlined, are within fertile limits,"⁶⁹ limits, she argued, that could often be achieved given the appropriate endocrine treatment.

Although Kleegman's calls for male infertility testing and treatment were not uniformly taken up by clinicians or the involuntarily childless,⁷⁰ the attention that she and others shined on "male responsibility" in cases of infertility functioned to transfer some attention in infertility rhetoric from individual women to heterosexual couples. Specifically, the "sterile marriage" emerged at this point as a recurrent theme that

highlighted the role that the couple itself played in the conception and bearing of healthy children. A *Newsweek* article from 1931 made early use of this trope, reasoning, “When one parent is of low fertility and the other of high fertility, children generally result normally. But in cases of low fertility of both parents or complete sterility of one, artificial insemination is necessary.” This piece—among the first popular press articles to publicize the possibility of artificial insemination—offered a clear conceptualization of fertility as partnered.⁷¹ Bearing children, in this light, is the result of a complex equation in which the unique chemical balance of individual mates combine to catalyze, ideally, “normal” reproduction. In her 1934 *Parents Magazine* article, Helena Huntington Smith reiterated this point by arguing that “the responsibility for a *sterile marriage* seldom attaches wholly to the husband, or wholly to the wife,” before adding that “in most cases, it is the combination rather than one individual that is at fault. A woman of slightly lowered fertility, married to a highly fertile partner, will have no difficulty in conceiving, but if her husband’s fertility is also below par a *sterile marriage* will result.”⁷²

This message that the “fault” for infertility was shared by the couple as a whole had circulated widely enough by the 1940s that it was not unusual for Corner to receive letters from involuntarily childless individuals—usually women—who claimed that both they and their husbands “had been checked by our physicians.”⁷³ By the 1950s, Corner was receiving correspondence from men that included not only their wives’ but also their own detailed medical histories. One such letter, sent from India, evidenced experience with the sperm analysis procedures that Kleegman championed. This individual reported having a “testicular biopsy to ascertain whether there are sperms in the testicles at least. It was found that there are many live and active sperms in the testicles but they could *not* come forward due to absence of *Vas duct* on both sides.” Hoping for a referral from Corner, he concluded his letter with the injunction that “*we* are sir, waiting for an early reply from you.”⁷⁴ For this man, the problem of infertility was one that he and his wife had been convinced to approach both proactively via medical treatment and as a couple.

It is no coincidence that these couple- and range-oriented conceptualizations of fertility emerged at around the same time as scientists were finding sex hormones to be neither sex specific nor necessarily antagonistic. Just as evidence surfaced that both sexes expressed varying degrees of femininity *and* masculinity according to their unique chemical compositions,⁷⁵ so too did the rhetoric of infertility start to consider men and women as expressing degrees of fertility conferred by chemical constitution. In some cases, rhetoric explicitly combined references to the former with appeals to the latter. Thereby, they indicated that arguments about fertility as a range expressed in and across both sexes were extensions of research on hormones that posited a separation of sex from secondary sex characteristics and gender expression. In his “The Family Doctor” series, Fishbein argued that “men of a feminine type” benefit from testosterone injections in terms of “general increased masculinity,” which he suggested includes an increase in fertility. Alterations in one’s hormonal substance, according to Fishbein, are responsible for corresponding alterations in proportion of masculinity/femininity and ability to procure offspring. This proposition also

surfaced in Corner's *The Hormones in Human Reproduction*, wherein he explained that hormones stimulate a degree of masculinity/femininity and fertility but play no role in determination of an individual's sex. "If the ovaries fail to develop or are removed in childhood," he noted, "and the ovarian hormones are thus unavailable, the girl still becomes a woman—infertile, of course, usually somewhat immature or boyish, but still physically a woman, not a male or a neutral individual. For this reason the term 'female sex hormone' has been generally abandoned and the safer name, estrogenic hormone, used instead."⁷⁶ This particular quotation hinted at the emerging psychoanalytic literature and its tendency to deem women "immature" who failed to follow traditional sociocultural patterns as well as the protective role that technical rhetoric (i.e., estrogenic hormone as the "safer name") might play in separating issues of medical jurisdiction from public and social debate.⁷⁷ Although Corner attempted to ring the death knell for rhetoric designating sex hormones as male or female, such rhetoric nonetheless remained dominant for years to come. By contrast, appeals such as Corner's circulated widely that drew from the theory that a balance of internal, shifting chemistry is responsible for one's placement on a continuum of masculinity, femininity, and—by extension—fertility.

And as fertility was increasingly construed at this time not only as existent on a continuum of hormonal balance but also as a characteristic of marriages or pairings, public vocabularies surrounding fertility seemed almost naturally to incorporate powerful figurative appeals denoting a "chemistry" between mates. By the middle of the eighteenth century, the writings of Robert Boyle, John Dalton, Sir Isaac Newton, and others had made it clear that chemistry is a relational science. Individual, distinct atoms attract or repel each other and, in this way, create chemical reactions that form new molecular substances. Biochemical inquiries of the early twentieth century demonstrated that these reactions occur within the body as catalysts for reproductive processes, the successful fulfillment of which depends, ideally, on love and affection between a man and a woman. With this picture coming into focus via diverse technical rhetoric, it did not take long for popular press coverage of fertility to integrate metaphors of physical chemistry into explications of the fertile marriage and its opposite, the sterile marriage. In a 1939 *Pictorial Review* article, Maxine Davis argued that, for some "sterile couples," "there is just some strange chemical hostility, scientifically inexplicable. Often these couples separate, marry again, and live to rear husky bouncing youngsters."⁷⁸ This appeal aligned not only with those of the early twentieth century's "human chemistry" movement whose advocates reduced humans to their atomic structures and argued that human relationships are a result of the interaction of those structures, but also with a vital literary tradition beginning with Johann Wolfgang Goethe's 1809 novel *Elective Affinities* wherein chemical attraction was employed as a metaphor for romantic relationships.⁷⁹ The illustration accompanying the *Pictorial Review* piece featured a well-heeled man looking up expectantly at a perplexed, lab-coat-yielding doctor. Far across from the man, on the opposite page, stood a forlorn woman holding a purse to her body and gazing away, down at the floor. This couple, despite focused effort and the resources that come with wealth and community standing, was childless. The doctor could not explain it, but their

combination nonetheless yielded a sterile marriage because, as readers were invited to see for themselves in the illustration, they lacked the necessary bond that comes with attraction for one another. Each partner's individual, chemical make-up, including their degrees of masculinity, femininity, and fertility, was incompatible with the other's make-up. Here, the chemical rhetoric of science was coopted to explain those cases of infertility for which science could not account.

Nature's Failure, Chemistry's Cure

But if rhetoric about infertility in the 1930s and 1940s is to be believed, it was the rare thing for which science of the time could not account. Assumptions therein about the abilities of scientific researchers to alleviate or altogether cure infertility reflected chemical rhetoric in general, which Jesper Sjöström argues "is based on the modernistic discourse, i.e., the idea that science generates constant progress and improvements for modern society."⁸⁰ To be sure, infertility rhetoric from this time enlisted seemingly unending appeals to this assumption that science is inherently progressive. Scientific advances, according to these entreaties, could *only* lead to more and better treatment.

Even slightly before the 1930s, Meaker published a popular press article in which he assured readers that effective treatment for involuntary childlessness was on the way. He reasoned:

the science of medicine is making constant progress in various fields, and during the last fourteen years light has been thrown on the problem of sterility. Today, doctors understand the causes of this condition better than ever before. Consequently they are able to treat their patients with greater success and bring happiness to many childless homes.⁸¹

Subsequent articles communicated just as enthusiastically about scientific gains and included explicit discussions of the chemistry of reproduction. For example, a 1932 Canada Press article deemed "the isolation of a sex hormone in pure form" to be "a great advance in the chemistry of life." Appeals such as this one to "the chemistry of life" implied that scientific findings would be enlisted within broader society for its betterment. This particular article concluded by drawing attention to the assumption that scientific investigation is ongoing and by identifying the social end to which such investigation would be devoted: "It is understood that the next problem of science is to accumulate this hormone in its pure form in sufficient quantities to make it accessible to physicians in treating illnesses peculiar to women."⁸² Given the rate of scientific growth and discovery, even scientists such as Corner concluded that, in the near future, "the childless wife" would "call and not in vain for the help that science can bring."⁸³

Indeed, writings and speeches by Corner and others characterized increasingly successful infertility treatment as an inevitability, something that would result as scientists garnered more empirical knowledge, which would then be enlisted by practitioners to cure infertility "patients." In a 1933 *New York Times* article, for instance, Laurence explained that ongoing research had led to new treatments in

which an injection of hormones corrects “a vital deficiency in the patient.” Similarly, at the end of 1939, Dr. Fishbein concluded an article with a toast to the future, the future’s as-yet-unknown scientific findings, and the notion that such findings would be taken up by clinicians to treat infertility. “No doubt,” he expounded, “1940 will see new hormones isolated from the pituitary gland.”⁸⁴ Scientific progress, according to Fishbein, was not only inevitable but also worthy of celebration, as it signaled the making of families that, in the course of nature, were not forthcoming.

To this way of thinking, nature was not something to be imitated but, rather, something to be remedied and improved upon. Standing in stark contrast to early twentieth-century energy conservation and moral physiology appeals, infertility rhetoric from the 1930s and 1940s repeatedly represented nature as deficient, uncooperative, or failed. Often this representation accompanied discussions about the artificial synthesis of hormones and the potential gains such synthetics might contribute to the natural body. For instance, writing for *The Lethbridge Herald* in 1936, Howard Blakeslee justified the “chemical ‘synthesis’” of “artificial male sex hormone” by explaining that “natural sources” simply had not yielded enough of the hormone for adequate scientific study and clinical application. Organic bodies—human and animal—were lacking, Blakeslee argued, so science was enlisted to take up the slack. And science excelled at this task by offering up something far better than what existed naturally: “more active hormones” or “super-hormones” capable, one might assume, of igniting fertility in even the most hopeless of cases or of inducing the state of “perfect” or “absolute fertility” that Meaker argued likely did not exist in nature.⁸⁵ Similarly, in *The Hormones in Human Reproduction*, Corner explained that “in some of our experiences, in which a large dose [of hormonal extract] was used, we even *improved upon nature* by producing more extensive progestational proliferation than normally occurs.” He added that “some failure of Nature’s process” was both alleviated and transcended by this scientific intervention.⁸⁶ A 1942 report from the Fertility and Endocrine Clinics of the Harvard-affiliated Brookline Free Hospital for Women announced, correspondingly, that “the day of meek submission to the whims of so-called ‘Nature’ in reproduction is past.”⁸⁷ Here and elsewhere, the artificial was taken up as a value term rather than as a pejorative, a signifier for the possibility of making all things better through chemistry.

And what was to be made better in this context was the natural, infertile body, a process that—as this rhetoric made clear—required the oversight of a technical expert. The 1930s saw a rise in infertility specialists, some of whom founded clinics devoted entirely to the treatment of sterile couples. Such developments encouraged journalists such as Gladys Denny Schultz to instruct her *Better Homes and Gardens* readers not only “to consult a doctor” but also to “faithfully and gladly submit to the whole rigamarole, if they must.”⁸⁸ This “rigamarole” generally included endocrine therapies designed to spark and oversee reproductive processes, as well as attempts to clear fallopian tubes blocked by inflammation, venereal diseases, and/or botched abortion attempts. Such therapies were portrayed in a number of popular press articles as easy and corrective. An Associated Press article from 1934 noted that the American College of Surgeons had reported that “the cure of 50 per cent. [*sic*] of

childlessness among 100 married couples” was found in “the easy method of taking daily a few drops of hormone extracts.”⁸⁹ Other articles communicated even more confidence in these “chemical substances which have ended sterility in men and women,” reiterating—as Laurence did in a 1937 *New York Times* article—that these “potent biological preparations” had to be administered under the strict oversight of specialists.⁹⁰ In one case, it was imparted that “the doctor injected hormones three times a week for a month,” ordered appropriate rest and nutritional supplementation, and thereby transformed a childless couple into parents.⁹¹ Although the changes in diet and lifestyle were important to this transformation, the change that truly acted as a trigger, according to this article, was the one that could only be induced by a trained professional. On the whole, then, this rhetoric represented fertility as a medically induced state in which the natural, infertile body is corrected to achieve a state of normalcy, often only at the goading of synthetically prepared, extra-potent chemicals.

Medicalization and the Circulation of Chemical Rhetoric

In the broadest sense, this rhetorical history offers an illustration of the evolving rhetorical ecology driving and constituting infertility rhetoric in the 1930s and 1940s. It demonstrates that the public vocabulary of chemistry defining infertility at this time emerged in a truly “public” sense in that its seemingly technical delineations encountered, resisted, and were otherwise shaped by public–professional interplays, mainstream media interpretations, and popular-lay re-appropriations. This attention to scientific rhetoric in particular as interacting, realigning, and transforming—rather than as fixed and situated—lends itself to an explication of medicalization that incorporates points of and opportunities for discursive cooptation. For instance, the “extended half-life” of early endocrinologists’ support for the biochemical variability of masculinity and femininity came to include the argument that fertility, too, is biochemically variable in terms of both women *and* men. This transformed message facilitated diverse arguments about infertility as a shared or coupled phenomenon and the irresponsibility of subjecting women to unending medical tests without also assessing the health of their male partners. Research on medicalization demonstrates that women’s experiences have historically been medicalized far more often than (and even to the exclusion of) men’s.⁹² Yet this analysis suggests that the ongoing interplays between, for instance, different public–professional encounters constitute public vocabularies of science and medicine and thereby ensure that neither the focus of medicalization, nor the medicalization itself, is inevitable.

In the case at hand, the process of medicalization was furthered significantly by the development of synthetic hormones. At that point, some of the agency ascribed to internal chemicals themselves was rhetorically transferred to scientists and clinical specialists, those with the power to produce super-hormones and employ them in their infertility cures. A speech given to the Worcester District Medical Society in 1946 by the famed infertility specialist John Rock elucidates this shift. Rock explained that “to induce ovulation, we would like very much to have the hormones of the anterior pituitary at our hands which would stimulate follicular growth and rupture

of at least one follicle.”⁹³ In this framing, the doctor’s *hands* are agents of fertility. They administer the hormones and therefore “induce” the follicular growth necessary for release of the egg and subsequent conception. These hands are also, then, responsible for fertility even more so than are the hormones prescribed or the individuals treated. In this respect, prominent infertility rhetoric of the 1930s and 1940s delineated infertility as largely outside the bounds of individual couples’ agency. The main instruction that readers could take from this and other sources was to seek out medical treatment and “submit” to whatever that treatment turned out to be. Such therapies were not designed to mirror nature’s dictates but rather to correct and improve upon them. The promise of progressive science positioned artificiality as superior to the natural world in many cases. While some couples experienced fertility naturally, this rhetoric implied that others simply needed something a little better than nature—something synthetic—to reproduce, a tenet that is no less pervasive in the twenty-first century via the unending “mandates” of the infertility industry.⁹⁴

Indeed, contemporary infertility discourses are constructed from a public vocabulary of chemistry that makes use of many of the same assumptions, tropes, and arguments featured in 1930s and 1940s sources. Not only are those facing infertility today charged with achieving, for example, the “perfect hormone balance for fertility,” but they are also repeatedly encouraged not to “discount the importance of having good chemistry with” their infertility specialists, a metaphorical appeal in which the medicalized patient–expert relationship subsumes even individual biochemistry and sexual attraction.⁹⁵ I suggest that the reason that this public vocabulary of chemistry not only incited the medicalization of infertility years ago but also remains prevalent today is because it was the product of complex rhetorical encounters among scientific, professional, public, and lay spheres. While technical, scientific outlets certainly introduced chemical terms and arguments into the broader rhetorical ecology of the twentieth century, their quick—at times, almost, simultaneous—adoption and enlistment by clinicians, journalists, and lay audiences facilitated their widespread circulation and evolution, and created the discursive scaffold necessary for establishing infertility within the clinical domain.

Notes

- [1] “The Pentacle of Réjuvenescence,” *British Medical Journal* 1 (1889): 1416. Cited in John Henderson, “Ernest Starling and ‘Hormones’: An Historical Commentary,” *Journal of Endocrinology* 184 (2005): 5–6.
- [2] Michael J. Aminoff, *Séguard-Brown: An Improbable Genius Who Transformed Medicine* (New York: Oxford University Press, 2011), 5.
- [3] Barbara Biesecker, “Coming to Terms with Recent Attempts to Write Women into the History of Rhetoric,” *Philosophy and Rhetoric* 25, no. 2 (1992): 155.
- [4] Infertility, in both historical and contemporary rhetoric, is repeatedly demarcated as the opposite of fertility, or—as the present analysis argues—one extreme in a range, with fertility occupying the other extreme. Thus, to conceptualize one is (and long has been) to conceptualize the other.

- [5] Celeste M. Condit, *Decoding Abortion Rhetoric: Communicating Social Change* (Urbana: University of Illinois Press, 1994), 228; Peter Conrad, *The Medicalization of Society: On the Transformation of Human Conditions into Treatable Disorders* (Baltimore, MD: John Hopkins University Press, 2007); Peter Conrad and Joseph W. Schneider, *Deviance and Medicalization* (St. Louis, MO: C. V. Mosby, 1980); see also Laura Mamo, *Queering Reproduction: Achieving Pregnancy in the Age of Technoscience* (Durham, NC: Duke University Press, 2007), 11.
- [6] Mary M. Lay, *The Rhetoric of Midwifery: Gender, Knowledge, and Power* (New Brunswick, NJ: Rutgers University Press, 2000); Judith Walzer Leavitt, *Brought to Bed: Childbearing in America, 1750–1950* (New York: Oxford University Press, 1988); K. K. Barker, “A Ship upon a Stormy Sea: The Medicalization of Pregnancy,” *Social Science and Medicine* 47, no. 8 (1998): 1067–76.
- [7] Margaret Marsh and Wanda Ronner, *The Empty Cradle: Infertility in America from Colonial Times to the Present* (Baltimore, MD: The John Hopkins University Press, 1996), 2.
- [8] Mary M. Lay, Laura J. Gurak, Clare Gravon, and Cynthia Myntti, “The Rhetoric of Reproductive Technologies,” in *Body Talk: Rhetoric, Technology, Reproduction*, eds. Mary M. Lay, Laura J. Gurak, Clare Gravon, and Cynthia Myntti, 3–26 (Madison: University of Wisconsin Press, 2000); Peter Conrad and Valerie Leiter, “Medicalization, Markets and Consumers,” *Journal of Health and Social Behavior* 45 (2004): 158–76; Arthur Greil, Julia McQuillan, and Kathleen Slauson-Blevins, “The Social Construction of Infertility,” *Sociology Compass* 5, no. 8 (2011): 736–46.
- [9] Jenny Edbauer, “Unframing Models of Public Distribution: From Rhetorical Situations to Rhetorical Ecologies,” *Rhetoric Society Quarterly* 35, no. 4 (2005): 6–9, 19. Cara A. Finnegan and Jiyeon Kang have enlisted the idea of rhetorical “circulation” toward similar ends: “‘Sighting’ the Public: Iconoclasm and Public Sphere Theory,” *Quarterly Journal of Speech* 90, no. 4 (2004): 396.
- [10] Edbauer, “Unframing Models of Public Distribution,” 13, 20.
- [11] See, for example, Lawrence J. Prelli, *A Rhetoric of Science: Inventing Scientific Discourse* (Columbia: University of South Carolina Press, 1989); Alan G. Gross, *The Rhetoric of Science* (Cambridge, MA: Harvard University Press, 1990); Jeanne Fahnestock, *Rhetorical Figures in Science* (New York: Oxford University Press, 1999); and Alan G. Gross and Joseph E. Harmon, *Science from Sight to Insight: How Scientists Illustrate Meaning* (Chicago: University of Chicago Press, 2014).
- [12] See, for example, Jeffrey A. Bennett, *Banning Queer Blood: Rhetorics of Citizenship, Contagion, and Resistance* (Tuscaloosa: University of Alabama Press, 2009); Lisa Keränen, *Scientific Characters: Rhetoric, Politics, and Trust in Breast Cancer Research* (Tuscaloosa: University of Alabama Press, 2010); John Lynch, *What Are Stem Cells? Definitions at the Intersection of Science and Politics* (Tuscaloosa: University of Alabama Press, 2011).
- [13] The texts from which I draw for this analysis consist of key scientific books and articles that are consistently cited across historical accounts of the field of reproductive endocrinology; “popular” or “mainstream” books and articles authored by technical experts targeting lay publics; international newspaper coverage of infertility and reproductive endocrinology; and lay correspondence from and to endocrinologists concerning issues of infertility. Mainstream texts were selected for analysis either because they had been cited by other historical accounts of infertility or because they emerged from archival repositories as unique and/or as as-yet-underrepresented according to a range of factors such as location of publication.
- [14] Conrad, *The Medicalization of Society*, 6; Edbauer, “Unframing Models of Public Distribution,” 20.
- [15] Walter R. Fisher, “Narration as a Communication Paradigm: The Case of Public Moral Argument,” *Communication Monographs* 51, no. 1 (1984): 7–8.

- [16] Celeste Michelle Condit and John Louis Lucaites, *Crafting Equality: America's Anglo-African Word* (Chicago: University of Chicago Press, 1993), xiv; Maurice P. Crosland, *Historical Studies in the Language of Chemistry* (Cambridge, MA: Harvard University Press, 1962), 3.
- [17] Lawrence Principe has recently argued that *The Sceptical Chymist* has long been misinterpreted and does not, in fact, dispute alchemical principles and practices but rather argues against the un-philosophical, commercial, and therefore vulgar use of alchemy. Principe, like Thomas Kuhn, argues that singular revolutionary texts and ideas are inherently mythical, even though they nonetheless serve a narrative purpose in historical accounts. "In Retrospect: The Sceptical Chymist," *Nature* 469 (2011): 30–31; Thomas Kuhn, *The Structure of Scientific Revolutions*, 4th ed. (Chicago: University of Chicago Press, 2012), 55.
- [18] Crosland, *Historical Studies in the Language of Chemistry*, 3, 30–32, 51; Eric R. Scerri, *The Periodic Table: Its Story and Its Significance* (New York: Oxford University Press, 2007), xvi.
- [19] Archibald Clow and Nan L. Clow, *The Chemical Revolution: A Contribution to Social Technology* (New York: Routledge, 1992); Robert Siegfried and Betty Jo Dobbs, "Composition, a Neglected Aspect of the Chemical Revolution," *Annals of Science* 24, no. 4 (1968): 281; William H. Brock, *The Norton History of Chemistry* (New York: W. W. Norton and Company, 1992), 76–77; Kenneth S. Zagacki and William Keith, "Rhetoric, Topoi, and Scientific Revolutions," *Philosophy and Rhetoric* 25, no. 1 (1992): 65.
- [20] Carolyn R. Miller, "Kairos in the Rhetoric of Science," in *A Rhetoric of Doing: Essays on Written Discourse in Honor of James L. Kinneavy*, eds. Stephen P. Witte, Neil Nakadate, and Roger D. Cherry, 310–27 (Carbondale: Southern Illinois University Press, 1992), 316. Anita Kildebaek Nielsen and Sona Strbanova, *Creating Networks in Chemistry: The Founding and Early History of Chemical Societies in Europe* (London, UK: Royal Society of Chemistry, 2008); Philippa A. Spoel, "The Science of Bodily Rhetoric in Gilbert Austin's *Chironomia*," *Rhetoric Society Quarterly* 28, no. 4 (1998): 7.
- [21] Markia Blondel-Mégrelis, "Liebig or How to Popularize Chemistry," *HYLE—International Journal for Philosophy of Chemistry* 13, no. 1 (2007): 49–51.
- [22] Leah Ceccarelli, *Shaping Science with Rhetoric: The Cases of Dobzhansky, Schrödinger, and Wilson* (Chicago: University of Chicago Press), 4, emphasis in original.
- [23] Barbara Orland, "The Chemistry of Everyday Life: Popular Chemical Writing in Germany, 1780–1939," in *Communicating Chemistry: Textbooks and Their Audiences, 1789–1939*, eds. Anders Lundgren and Bernadette Bensaude-Vincent, 327–66 (Canton, MA: Science History Publications, 2000), 332–33.
- [24] Orland, "The Chemistry of Everyday Life," 327–66.
- [25] Bernadette Bensaude-Vincent, "In the Name of Science," in *Science in the Twentieth Century*, eds. John Krieger and Dominique Pestre (Amsterdam: Harwood Academic Publishers, 1997), 320–21; Ron Eglash, Jennifer L. Croissant, Giovanna Di Chiro, and Rayvon Fouché, eds., *Appropriating Technology: Vernacular Science and Social Power* (Minneapolis: University of Minnesota Press, 2004).
- [26] Katherine Pandora, "Knowledge Held in Common: Tales of Luther Burbank and Science in the American Vernacular," *Isis* 92, no. 3 (2001): 491, 497. Social psychologist Wolfgang Wagner defines "vernacular science knowledge" as a "widely distributed form of popular understanding of science." Wolfgang Wagner, "Vernacular Science Knowledge: Its Role in Everyday Life Communication," *Public Understanding of Science* 16, no. 1 (2007): 11, 14.
- [27] Bernadette Bensaude-Vincent and Isabelle Stengers, *A History of Chemistry*, trans. Debora van Dan (Cambridge, MA: Harvard University Press, 1996), 168; Orland, "The Chemistry of Everyday Life," 334; Robert Bud and Gerrylynn K. Roberts, *Science versus Practice: Chemistry in Victorian Britain* (Dover, NH: Manchester University Press, 1984), 59–63.
- [28] Ernest Homburg, Anthony S. Travis, and Harm G. Schröter, *The Chemical Industry in Europe, 1850–1914: Industrial Growth, Pollution, and Professionalization* (Dordrecht, Netherlands: Kluwer Academic Publishers, 1998).

- [29] *Science*, "The Popularization of Chemistry," 70 (Sept. 27, 1929): 302.
- [30] Leah Ceccarelli, *On the Frontier of Science: An American Rhetoric of Exploration and Exploitation* (East Lansing: Michigan State University Press, 2013), 13.
- [31] Joseph S. Fruton, "The Emergence of Biochemistry," *Science* 192, no. 4237 (April 23, 1976): 327.
- [32] Fruton, "The Emergence of Biochemistry," 328–30.
- [33] Marcel Florkin, *Comprehensive Biochemistry*, Vol. 30, *A History of Biochemistry*, eds. Marcel Florkin and Elmer H. Stotz (New York: Elsevier Publishing Company, 1972), 183–88.
- [34] Juda Hirsch Quastel, "The Development of Biochemistry in the 20th Century," *Molecular and Cellular Biochemistry* 69, no. 1 (1985): 19; Harmke Kamminga, "Biochemistry, Molecules and Macromolecules," in *Science in the Twentieth Century*, eds. John Krige and Dominique Pestre, 525–46 (Amsterdam: Harwood Academic Publishers, 1997); Zagacki and Keith, "Rhetoric, Topoi, and Scientific Revolutions," 66, emphasis in original.
- [35] The term endocrinology was not used until the early twentieth century: Henderson, "Ernest Starling and 'Hormones,'" 9.
- [36] Ernest Henry Starling, *The Croonian Lectures on the Chemical Correlations of the Body* (London, UK: Women's Printing Society, 1905); Henderson, "Ernest Starling and 'Hormones,'" 5–9; Merriley Borell, "Organotherapy and the Emergence of Reproductive Endocrinology," *Journal of the History of Biology* 18, no. 1 (1985): 9–13; Edward A. Schäfer, "The Hormones which are Contained in Animal Extracts: Their Physiological Effects," *Pharmaceutical Journal* 79 (1907): 670–74. On the conceptual metaphor of body-as-communication-network, see Thomas J. Darwin, "Intelligent Cells and the Body as Conversation: The Democratic Rhetoric of Mindbody Medicine," *Argumentation and Advocacy* 36, no. 1 (1999): 39–40. For a discussion of hormonal communication as "a transmission of affect," see Teresa Brenna, *The Transmission of Affect* (Ithaca, NY: Cornell University Press).
- [37] Borell, "Organotherapy and the Emergence of Reproductive Endocrinology," 8–14; Celia Roberts, "'A Matter of Embodied Fact': Sex Hormones and the History of Bodies," *Feminist Theory* 3 (2002): 11; Alan S. Parkes, "The Rise of Reproductive Endocrinology, 1926–1940," in *Sex, Science and Society: Addresses, Lectures and Articles by A. S. Parkes*, 14–36 (London, UK: Oriel Press Limited, 1966).
- [38] Sophie D. Aberle and George W. Corner, *Twenty-Five Years of Sex Research: History of the National Research Council Committee for Research in Problems of Sex, 1922–1947* (Philadelphia: W. B. Saunders Company, 1953), 1–8; Borell, "Organotherapy and the Emergence of Reproductive Endocrinology," 18–19; Sophia Kleegman, "Medical and Social Aspects of Birth Control," *The Journal—Lancet* (November 15, 1935): 728.
- [39] Aberle and Corner, *Twenty-Five Years of Sex Research*, 13–24; Borell, "Organotherapy and the Emergence of Reproductive Endocrinology," 25; Nelly Oudhoorn, "On the Making of Sex Hormones: Research Materials and the Production of Knowledge," *Social Studies of Science* 20 (1990): 5–33. It should be noted that the Committee for Research on Problems of Sex went to great lengths to separate its research from birth control advocacy and development, although its research endeavors were often directly applicable to those interested in establishing methods of hormonal contraception. Adele E. Clarke, *Disciplining Reproduction: Modernity, American Life Sciences, and "The Problems of Sex"* (Berkeley: University of California Press, 1998), 185–90.
- [40] Bruno Latour rightly problematizes traditional understandings of scientific discoveries by arguing that they are dependent upon a number of different forces and connections—rather than upon the work of discrete actors. Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988), 16.
- [41] Bruno Latour and Steve Woolgar, *Laboratory Life: The Social Construction of Scientific Facts* (Beverly Hills, CA: Sage Publications, 1979), 45, 58, 61; George W. Corner, "Our Knowledge

- of the Menstrual Cycle, 1910–1950,” *The Lancet* (April 12, 1951): 919–23; Oudshoorn, “On the Making of Sex Hormones,” 22.
- [42] Clarke, *Disciplining Reproduction*, 122–28; Thomas Laqueur, *Making Sex: Body and Gender from the Greeks to Freud* (Cambridge, MA: Harvard University Press, 1990), 153.
- [43] Oudshoorn, “On the Making of Sex Hormones,” 8.
- [44] Quoted in Nelly Oudshoorn, *Beyond the Natural Body: An Archeology of Sex Hormones* (New York: Routledge, 1994), 24; Walter Heape, *Sex Antagonism* (London, UK: Constable, 1913); J. D. Biggers, “Walter Heape, FRS: A Pioneer in Reproductive Biology,” *Journal of the Society for Reproduction and Fertility* 93, no. 1 (1991): 173–74; Clarke, *Disciplining Reproduction*, 125–26. See also Robert T. Frank, *The Female Sex Hormone* (Springfield, IL: Charles C. Thomas, 1929); Theodoor H. Van de Velde, *Fertility and Sterility in Marriage: The Voluntary Promotion and Limitation*, trans. F. W. Stella Browne (1929; New York: Medical Books, 1931).
- [45] Anne Fausto-Sterling, *Sexing the Body: Gender Politics and the Construction of Sexuality* (New York: Basic Books, 2000), 183.
- [46] Bernhard Zondek, “Mass Excretion of Oestrogenic Hormone in the Urine of the Stallion,” *Nature* 133 (February 10, 1934): 209–11; Vladimir Korenchevsky and Kathleen Hall, “Manifold Effects of Male and Female Sex Hormones in Both Sexes,” *Nature* 142 (December 3, 1938): 998; Nancy H. Callow and Robert K. Callow, “The Isolation of Androsterone and Transhydroandrosterone from the Urine of Normal Women,” *Biochemical Journal* 32 (1938): 1759–62.
- [47] Darwin, “Intelligent Cells and the Body as Conversation,” 35, 40.
- [48] Oudshoorn, *Beyond the Natural Body*, 36; Roberts, “A Matter of Embodied Fact,” 14.
- [49] This is not to say that scientists and clinicians were necessarily the first individuals to talk about reproduction in this way, but it is to say that they are the first ones that are currently on record as having so done.
- [50] Marsh and Ronner, *The Empty Cradle*, 135.
- [51] Elizabeth M. Ramsey, *George Washington Corner, 1889–1981* (Washington, DC: National Academy of Sciences, 1994), 71.
- [52] George W. Corner, “The Relation between Menstruation and Ovulation in the Monkey,” *Journal of the American Medical Association* 89, no. 22 (November 26, 1927): 1838; Ramsey, *George Washington Corner, 1889–1981*, 64; Linda Gordon, *The Moral Property of Women: A History of Birth Control Politics in America*, rev. ed. (Urbana: University of Illinois Press, 2002), 32.
- [53] Corner, “The Relation between Menstruation and Ovulation in the Monkey,” 1838–39. See also, Edgar Allen, “The Time of Ovulation in the Menstrual Cycle of the Monkey, Macacus Rhesus,” *Experimental Biology and Medicine* 23 (February 1926): 381–83; Edgar Allen, “Further Evidence Concerning the Menstrual Cycle of the Monkey, Macacus Rhesus,” *The Anatomical Record* 35 (March 1927): 1–2. Corner’s frequent, unapologetic references to the slaying of animals for human study and benefit echo the writings of pre-Boyle alchemists.
- [54] Frank, *The Female Sex Hormone*, 290.
- [55] Bernice L. Hausman, “Ovaries to Estrogen: Sex Hormones and Chemical Femininity in the 20th Century,” *Journal of Medical Humanities* 20, no. 3 (1999): 167.
- [56] William L. Laurence, “The Week in Science: The Hormones,” *New York Times* (September 24, 1933): XX8.
- [57] William L. Laurence, “Remedy Is Tested for Childlessness,” *New York Times* (October 26, 1934): 6; Laurence, “The Week in Science,” XX8.
- [58] Edbauer, “Unframing Models of Public Distribution,” 9.
- [59] George Washington Corner, “Ovarian Therapy: Speech before the New York State Medical Board,” May 15, 1934, MS Collection 11, Box E-O, George Washington Corner Papers, American Philosophical Society Archives, Philadelphia, PA; Associated Press, “Fifty Percent

- Cure is Reported in Childlessness: American College of Surgeons Told of Method of Ending Infertility," *Winnipeg Free Press* (October 20, 1934): 1.
- [60] Samuel Raynor Meaker, *Human Sterility: Causation, Diagnosis, and Treatment; A Practical Manual of Clinical Procedure* (Baltimore, MD: The Williams and Wilkins Company, 1934); William L. Laurence, "Cure of Sterility by Hormones Told," *New York Times* (October 30, 1937) 11; Howard W. Blakeslee, "Male Sex Hormones: Now Produced Artificially," *The Lethbridge Herald* (September 12, 1936): back page.
- [61] Morris Fishbein, "The Family Doctor," *Chester Times* (Pennsylvania) (December 27, 1939): 7.
- [62] George W. Corner, *The Hormones in Human Reproduction* (Princeton, NJ: Princeton University Press, 1942), ix; *Ourselves Unborn: An Embryologist's Essay on Man* (New Haven, CT: Yale University Press, 1941); "Extracts from Reviews," October 1, 1944, Box 8, Folder 18, George Washington Corner Lectures, American Philosophical Society Archives, Philadelphia, PA, 8–9.
- [63] "Extracts from Reviews," 8–9.
- [64] Corner, *The Hormones in Human Reproduction*, 54, 239.
- [65] Meaker, *Human Sterility*, 3–7.
- [66] For this reason, it was not until several decades later—and the development and distribution of the hormonal birth control pill—that recognition and discussion of "involuntary childlessness" began to circulate widely.
- [67] Samuel Meaker, Charles H. Lawrence, and Samuel N. Vose, "Practical Details in the Management of Sterility, with Special Reference to Endocrine Factors," *New England Journal of Medicine* 230 (July 22, 1944), 756–57; Marsh and Ronner, *The Empty Cradle*, 131.
- [68] For an example of coverage on male sterility from the 1930s, see *Readers Digest*, "Test-Tube Babies" (February 1937): 18–20.
- [69] Sophia J. Kleegman, "Recent Advances in the Diagnosis and Treatment of Sterility," *The Medical Woman's Journal* 46 (January 1939), 3, 1, 9.
- [70] Comment by Asta Wittner following Kleegman, "Recent Advances in the Diagnosis and Treatment of Sterility," 10.
- [71] *Newsweek*, "'Ghost' Fathers: Children Provided for the Childless" (May 12, 1931): 16.
- [72] Helena Huntington Smith, "Making It Possible to Have a Baby," *Parents' Magazine* (November 1934): 19, emphases added.
- [73] George Washington Corner Papers, "Miscellaneous Inquiries from Laymen #2," April 12, 1947, Box 16, Folder 60, American Philosophical Society Archives, Philadelphia, PA;
- [74] George Washington Corner Papers, "Miscellaneous Inquiries from Laymen #3" September 1, 1955, Box 17, Folder 61, American Philosophical Society Archives, Philadelphia, PA, underlining in original; emphasis added.
- [75] Nelly Oudshoorn, "Endocrinologists and the Conceptualization of Sex, 1920–1940," *Journal of the History of Biology* 23, no. 2 (1990): 164.
- [76] Corner, *The Hormones in Human Reproduction*, 96.
- [77] Randi Hutter Epstein, "Emotions, Fertility, and the 1940s Woman," *Journal of Public Health Policy* 24 (2003): 195–211; Monica M. E. Bonaccorso, *Conceiving Kinship: Assisted Conception, Procreation and Family in Southern Europe* (New York: Berghahn, 2009), 80.
- [78] Maxine Davis, "Why Don't We Have a Baby?" *Pictorial Review* (January 1939): 12.
- [79] See, for instance, Thomas Dreier, *Human Chemicals* (New York: Backbone Society, 1910); *We Human Chemicals: The Knack of Getting Along with Everybody* (Scarsdale, NY: Updegraff Press, 1948); William Fairburn, *Human Chemistry* (New York: The Nation Valley Press, 1914). Johann Wolfgang von Goethe, *Elective Affinities* (1809; New York: Penguin Classics, 1978).
- [80] Jesper Sjöström, "The Discourse of Chemistry (and Beyond)," *HYLE—International Journal for Philosophy of Chemistry* 13, no. 2 (2007): 83–84.
- [81] Samuel R. Meaker, "Two Million American Homes Childless," *Hygeia* 5 (November 1927): 546.

- [82] Canada Press, "Collips Discovery is Boon to Women," *The Lethbridge Herald* (May 28, 1932): 9.
- [83] Corner, *The Hormones in Human Reproduction*, 242.
- [84] Laurence, "The Week in Science," XX8; Fishbein, "The Family Doctor, 7.
- [85] Blakeslee, "Male Sex Hormones," back page; Meaker, *Human Sterility*, 3–7.
- [86] Corner, *The Hormones in Human Reproduction*, 113, 232, emphasis added.
- [87] Free Hospital for Women, "Sixty-Seventh Annual Report," 1940, MS collection 161, Box 1, Folder 41, John Rock Papers, Center for the History of Medicine, Francis A. Countway Library of Medicine, Harvard University, 19.
- [88] Marsh and Ronner, *The Empty Cradle*, 155–58; Gladys Denny Schultz, "Maybe You Can Have a Baby," *Better Homes and Gardens* 18 (August 1940): 55, 59.
- [89] Associated Press, "Fifty Percent Cure is Reported in Childlessness," 1.
- [90] Laurence, "Cure of Sterility by Hormones Told," 11.
- [91] Davis, "Why Don't We Have a Baby," 13.
- [92] Kathryn Pauly Morgan, "Contested Bodies, Contested Knowledges: Women, Health, and the Politics of Medicalization," in *The Politics of Women's Health: Exploring Agency and Autonomy*, ed. Susan Sherwin, 83–121 (Philadelphia, PA: Temple University Press); Catherine Kohler Riessman, "Women and Medicalization: A New Perspective," *Social Policy* 14, no. 1 (1983): 3–18.
- [93] John Rock, "Disorders in Menstruation and General Endocrine Aspects of Gynecology," February 27, 1946, MS Collection 161, Box 19, Folder 30, John Rock Papers, Center for the History of Medicine, Francis A. Countway Library of Medicine, Harvard University, 26–27.
- [94] Elizabeth C. Britt, "Medical Insurance as Bio-Power: Law and the Normalization of (In) fertility," in *Body Talk: Rhetoric, Technology, Reproduction*, eds. Mary M. Lay, Laura J. Gurak, Clare Gravon, and Cynthia Myntti (Madison: University of Wisconsin Press, 2000), 213; *Conceiving Normalcy: Rhetoric, Law, and the Double Binds of Infertility* (Tuscaloosa: The University of Alabama Press, 2001), 58.
- [95] Robert Green, *Perfect Hormone Balance for Fertility: The Ultimate Guide to Getting Pregnant* (New York: Three Rivers Press, 2008); Alice D. Domar and Alice Lesch Kelly, *Conquering Infertility: Dr. Alice Domar's Mind/Body Guide to Enhancing Fertility and Coping with Infertility* (New York: Penguin Books, 2004); Sandra L. Glahn and William R. Cutrer, *The Infertility Companion: Hope and Help for Couples Facing Infertility* (Grand Rapids, MI: Zondervan, 2004), 133.